

**CITIZENS' PETITION
FOR AN
ENVIRONMENTAL ASSESSMENT WORKSHEET
FOR THE PROPOSED
“BORDER TO BORDER TOURING ROUTE”**

NOTE: All citations are followed by page numbers that correspond to the petition's chronological page order. See pages 4 & 207A for Reference Key.

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REFERENCES:

- **Reference Key:**.....207A
- **Documents: Doc 1-100 (printed out)**208-430A-O
- **Invasives: (1) -(30) with (20)-(30) printed out)**431-470
- **Wildlife References: Ref 1- 35 (printed out)**470A-589

PREFACE

This Petition for an Environmental Assessment Worksheet (EAW) first describes the “Border to Border touring Route” and then outlines how and why the project has the potential for significant environmental effects.

For purposes of this petition, potential project impacts in Lake County are used as a surrogate and offered as a representative sample of some of the more sensitive areas and waters of the state that are jeopardized by the entire project.

Therefore, environmental concerns we are raising here are to be understood as generally applicable throughout the project impact area. This petition provides the proximate and root causes for the anticipated significant environmental damage that we associate with the project along the entire route that need study and action based on facts and data vs. the current “wait and see” approach of the proposer.

We maintain that without Environmental Review, it is premature and indeed impossible for the DNR to formulate an effective and meaningful management plan for the route that would presume to address environmental impacts and concerns. Many types of environmental damages may not be mitigable.

Without an environmental assessment that clearly identifies the potential adverse impacts, it is highly improbable that a management plan, designed to protect the resources, is properly scoped. For example, the pristine waters crossed by the unpaved roads targeted for this route typically lack minimal buffer zones needed to prevent increased sedimentation and fugitive dust pollution that would be generated by the significant increases in high-impact traffic anticipated, but as yet unquantified by the project. Given the national level of advertising on the Minnesota Department of Natural Resources website and the National Off Highway Conservation Council website, the Minnesota Four Wheel Drive Association Club websites, and on other Off Roading Club websites and in social media across the nation, realistic estimates of increased traffic must be based on sound statistics set forth in the requested assessment.

Only environmental review, we contend, could result in an effective management plan that would look at substituting these unpaved road segments crossing vulnerable pristine waters for ones that could be sustained long term, with significantly less environmental impact.

Properly applied, environmental review, can be used to determine that the proposed primitive, single lane roads would force vehicles to go off road to pass one another and, in so doing, create significant increases in user conflicts, soil erosion, sedimentation to waters and in the spread of invasive species.

Environmental review can be used to estimate the potential losses of natural resources attributable to the planned increase in high-impact motorized traffic from the nationally advertised proposed route that would traverse some of the highest priority conservation areas and areas of both high and outstanding biodiversity significance in the state. (See maps pgs. 141-146)

Just because there are existing unpaved road types does not account for the incremental, cumulative increase of impacts from the larger numbers of proposed high-impact vehicles traveling these routes, as is envisioned for this project to justify its creation because it would bring economic stimulus to rural and remote areas. This is a justification several Counties, such as Clearwater and Red Lake Counties refuted in opposing the proposed route.

Others in Support of an EAW include:

1. Former Minnesota House Chair of Water and Natural Resources Policy Committee, John Persell, who strongly urged DNR Commissioner Strommen in August 2020, in person, to support an EAW and trigger threshold metrics BEFORE any route alignment was opened. See letter attached. (Doc 1) pgs. 209-10.
2. The Sierra Club of Minnesota
3. The Izaak Walton League of Minnesota
4. Northeastern Minnesotans for Wilderness

These groups all urged DNR Commissioner Strommen to undertake an EAW on the Border to Border Route. See 3 letters. (Doc 1B) pgs. 215 A-L

5. Our own group also wrote to Commissioner Strommen requesting environmental review. (Doc 2A) pgs. 217A-E

Once this route is opened - and these historically low-trafficked roads are nationally advertised on more websites and in social media across the country - there would be no realistic way to put it back into the can.

The Minnesota Department of Natural Resources (MnDNR) Border to Border Needs Table, submitted to MnDNR Environmental Review, states that the proposed route crosses several designated trout streams. The facts are, as documented in the final alignment map, the proposed route, in Lake County alone, would cross 27 designated trout streams 61 times, all on unpaved roads, exposing them to increased sedimentation and fugitive dust pollution. (Doc. 1C) pg. 215 M & Maps pgs. 75-83 DNR B2B Summary Project Reports (Doc 101) pgs. 430A-G

In a letter to DNR Bill Johnson, Planning Director of EWR Environment and Policy Review, we asked that our multiple findings of inaccurate and misleading information in the MnDNR Project Summary, that minimized the scope of the project, be taken into consideration for a discretionary environmental review. (Doc. 1D) pgs. 215 N-X

Although the route is on varying existing road types, many of the roads in northern Minnesota were created long before the science of road ecology or environmental concerns. Therefore, existing unpaved roads, with minimal buffer zones, do cross Exceptional MPCA ranked waters and designated trout streams. Some of these road types are single lane or unmaintained roads with no shoulders and no drainage. Due to remote locations or low-density populated areas with historically low traffic volume, pristine natural resources and wildlife have not been impacted

To increase high impact traffic on these roads, with the proposed designated, nationally-advertised Border to Border route, would put some of the state's most pristine natural resources and wildlife at a significant increased risk for adverse impacts.

These roads were never built to be a designated touring route for high impact traffic that would be nationally advertised. We maintain, contrary to the MnDNR Border to Border Touring Route Project Summary, there is a significant change in use designating them for the proposed route that requires environmental review. (Doc 2B) pgs.217 F

The primitive USFS Operational Maintenance Level 2 roads (OML 2) are classified for dispersed recreation, not a nationally advertised route for high impact vehicles; another change in use.

With 581 new bodies of water added to impaired waters in 2019, Minnesota now sits with 56% of its waters on the impaired waters list, according to the Minnesota Pollution Control Agency (MPCA). In contrast, during the same time period, only 14 lakes and 2 streams were removed from the list. This should be alarming to all Minnesotans. It's clear from the data in Minnesota that we are going in the wrong direction and must start taking water protection more seriously.

<https://www.startribune.com/state-finds-56-of-minnesota-s-lakes-and-streams-are-impaired/564825512/>

Of the over 2,000 known native wildlife species in Minnesota, approximately 346 are considered "Species in Greatest Conservation Need" because they are rare, declining or face serious threats that may cause them to decline. Habitat degradation is one of the leading stressors of "Species in Greatest Conservation Need."

<https://minnesotago.org/trends/biodiversity> (Doc. 9 C) pg.239A

The World Wildlife Fund reported in 2019 that an average of 60% of the global vertebrate populations had been lost between 1970-2014 mainly due to habitat loss. This news stunned Chris Clayton, the editor-in-chief of the DNR magazine, [Minnesota Conservation Volunteer](#). He asked the Minnesota Biological Survey staff "how they stayed sane in the face of serious environmental challenges.

"When we share our data, we start with the dire news," said Hannah Texler, an ecologist and botanist who specializes in plant surveys.

"But then we make it positive. Yes, we have lost a lot of native habitat in Minnesota. But we can use our data to help preserve what's left." (Doc. 1E)
pgs. 215 Y& Z

That is precisely the driving force behind this petition; to help bring awareness to the risks the proposed Border to Border touring route poses to our fragile ecosystem, to interconnected watersheds, and to the significant risk of further habitat degradation and fragmentation resulting in species decline or extirpation in Minnesota.

In addition, we believe it is vitally important, in light of the State's Clean energy Policy and the Governor's statement , "Climate change threatens the very things that make Minnesota a great place to live—from our wonderful lakes to farmable land and clean air," that an environmental review take into account the significant load of greenhouse gasses generated by off road vehicles and the continued expansion of the sector with the creation and national advertising of this designated, recreational route for Highway Licensed Off Road vehicles.

Because all the vehicles that could access this route can *already* drive on every single road in a dispersed, sustainable way, we believe the "no build" option would be the most effective environmental review outcome. It would take nothing away from users and would protect the environment and wildlife from known impacts.

We are advocating for an environmental review to, *at a minimum, inform the DNR* to put in place effective, long term protections for what is left of our pristine natural resources, wildlife and for the state's critical remote areas that have been identified by scientists as refuge in climate change for the survival of wild and aquatic life.

Importantly this would include avoiding sensitive and fragile terrestrial areas and known wildlife corridors. This is imperative if we are to carry forward for future generations the legacy of our remaining pristine nature and wildlife and protect the biodiversity that is crucial to maintain these fragile ecosystems.

Now is the time to thoroughly review and determine the significant risks of environmental damage that would be caused by increased high impact traffic to some of the most pristine waters and natural resources in the state, to areas of outstanding biodiversity, and areas of high priority for conservation protection that would be traversed by the proposed route. Now is the time for environmental review **BEFORE** the proposed route would proceed.

Fundamentally, in order to conduct adequate environmental review of the proposed Border to Border Touring Route from an on-going socio-economic or environmental perspective, there must also be a reasonably confident projection of traffic levels and expected growth in traffic levels 5, 10, 20 years out, along each portion of the route. The proposers have not provided this. Instead, they have outlined an approach of "monitoring" the route for environmental damage with remedial or attempted mitigation actions being taken only after a problem has occurred.

This position of taking preventative measures with environmental review before the route is open vs. monitoring and taking action after environmental damage has occurred, is supported by the legal case of: Trout Unlimited v. Minnesota Department of Agriculture 528 N.W.2d 903; 909 (Minn. App. 1995); review denied:

"By deferring this issue to later permitting and monitoring decisions, the Commissioner abandoned his duty to require an EIS where there exists a "potential for significant environmental effects." Minn.Stat. § 116D.04, subd. 2a. The potential impacts of chemicals should be analyzed during the EIS process, rather than waiting until Triple J has expended time and effort on its irrigation and farming operations only to face the risk of later restriction or withdrawal of its permits."

I. Project Description:

This project is entitled the "Border to Border Touring Route" by the Minnesota Department of Natural Resources. It entails a linear design, approximately 764 miles long, on unpaved roads stretching across the entire northern third of Minnesota. It would start at the border of North Dakota, and end in Silver Bay on the shore of Lake Superior. <https://www.dnr.state.mn.us/input/mgmtplans/touring/index.html>

The route would cross eight counties: Kittson, Marshall, Pennington, Lake of the Woods, Itasca, Beltrami, St. Louis and Lake.

This project consists of **two phases**; the main stem phase is phase one, with the second phase consisting of two or more spur trails off the main stem to various points of user skill challenge or tourist interest. (Doc. 1A) pgs.211- 215 (see pg. 215)

The Minnesota Four Wheel Drive President Rick Langess stated, "This route is just phase one of a two-phase project. The goal is to work with local governments who will bring us ideas on where to build loops that will attract wheelers to their area." (Doc 3) pgs.218-220

In the National Off Highway Conservation Council description of product deliverables, it states there will be two routes, one East to West and one South to North, and that "... the team will approach as one full route with 2 sections of branches of the route." (Doc. 2) pgs.216-17

The proposed project would involve formal designation of a linear route with posted road signage and be nationally advertised and promoted as an adventure touring route for highway licensed Off Road Vehicles on the DNR, National Off Highway Vehicle Conservation Council (NOHVCC), and Off Roading Club websites and on social media across the country.

The project's purpose as stated in literature by the NOHVCC route finder, hired to plan the route, is to **provide an entertaining and challenging outing** for enthusiasts of four-wheel drive vehicles or off-road vehicles in addition to supporting connections to communities, amenities, scenic, cultural and historic features, while increasing awareness of OHVs". (Doc. 4) pg. 221

II. Proposer of the Project:

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IV. Brief description of the potential for significant environmental effects which may result from the project:

“Build it, and they will come.” That is what the project is designed to do - bring traffic, lots of it. The project is a designated route, that would be nationally advertised and is designed to increase high impact traffic on unpaved roads, many of which are primitive, unmaintained or single lane use, that would cross the northern third of the state and skirt remote wilderness areas.

Some of the most pristine waters in the state would be crossed multiple times on unpaved roads, many with minimal buffer zones. Conservation Prioritization Areas and Outstanding and High Biodiversity sites would be traversed by an increase in high impact traffic.

Invasive species spread across the state would risk overtaking native vegetation in areas, destroying habitat, destabilizing biodiversity and entire ecosystems. Increased high impact traffic would increase the noise impact for wildlife and humans on roads with historical low traffic volume. Noise pollution can have a cascading negative affect on wildlife behavior and survival rates.

The project would be nationally advertised on off roading club websites around the country, including caravan events such as Jeep Jamboree USA which averages 100 vehicles with 500 passengers per event.

There is no guaranteed long-term funding in place or management plan with added personnel in place to monitor and control invasive species, no funding for increased personnel or plan to manage increased fire risk due to increased traffic in areas *already* monitored for fire risk with low traffic volumes and no long term guaranteed funding or plan for added enforcement oversight for the 764-mile route.

The nature and extent of the increased motor vehicle traffic on remote roads will have the following impacts:

A. Water pollution.

The Border to Border Touring Route for highway licensed off road vehicles on unpaved roads, would have adverse effects on water quality in four (4) watersheds: Great Lakes, Rainy River, Upper Mississippi River and the Red River of the North.

These high impact vehicles, would add to the **sediment load** and fugitive dust pollution to sensitive lakes, rivers, trout streams, and wetlands of the following waters:

1. "exceptional" MPCA - ranked waters;
2. "prohibited protection" ranked streams by the MPCA;
3. "outstanding value resource waters";
4. lakes with wild rice;
5. lakes of "biological significance";
6. Boundary Waters Canoe Area Wilderness;
7. trout streams; and
8. protected wetlands.

Human waste will also impact the above waters.

Car Tire Chemicals are contaminants that impact waters that scientists have discovered kill or negatively impact several known sensitive fish species.

B. Air Pollution.:

Fugitive dust – and exhaust - will impact air quality, human and wildlife health.

"Today much of the air pollution in Minnesota originates from smaller more diffuse sources such as cars, trucks, tractor trailers, small businesses and residential wood burning. Individually each of these sources may not produce much pollution, but together they become a major concern for public health. Addressing these sources will require new, innovative strategies that move beyond traditional regulatory programs. Through community outreach, voluntary programs and partnerships we must all work together to achieve future emissions reductions from these small, widespread sources."

<https://www.eqb.state.mn.us/2017-environment-and-energy-report-card>
(Doc. 10F) pg. 243G

C. Increase the Likelihood of Fire Damage.

D. Adverse effect on endangered, threatened, and other sensitive species of wild and aquatic life and plants, particularly when an exemption exists, under the Minnesota endangered species law, that removes protection for endangered plants existing within the entire road right-of-way. [Minn. Stat. 84.0895.]

E. Adverse effect on all vegetation and animals, areas of outstanding biodiversity and high conservation priority areas.

F. Spread of Invasive Species across the entire state.

G. Noise Pollution– impacting animals and quietude.

Terrestrial noise can be an invisible source of habitat degradation, influencing predator-prey dynamics. Noise affects species occupancy, behavior, distribution, reproduction, physiology and ultimately fitness and survival rates.

https://scholarworks.boisestate.edu/bio_facpubs/560/ (Ref. 1) pgs.472-480

V. Material evidence indicating that, because of the nature or location of the proposed project, there may be potential for significant environmental effects:

How Traffic Will Increase and More Environmental Damage Occurs

Fundamentally, the purpose of this project is to generate higher volumes of high impact traffic, on unpaved roads. It will undoubtedly do so, creating the potential for significant environmental effects.

A USFS list of questions generated for DNR Parks and Trails about the proposed B2B stated among a number of concerns:

“Some routes are really low use and 5 cars a day increase could be a large impact.” (Doc 10G) pgs. 243H-J

The increased traffic impacts on the designated route can be expected from two sources:

1. the diversion of existing and otherwise diffused motorized recreational uses of these low traffic volume roads in the region onto the proposed route, resulting in the concentration of these previously diffused impacts on to a single route; and
2. the increase in public awareness of the route's existence, via national advertising and promotion, attracting a still higher level of destination focus on the route from both in-state users and out-of-state users, who do not recreate with their OHVS in this part of Minnesota or in the state.

The initial DNR Project manager, Mary Straka, wrote to the Clearwater Lake Area Association President, in March 2018, about traffic volume, stating, "The estimate may be a few thousand vehicles a year to start with on the more attractively marketed segments." (Doc. 7) pgs. 232-34

The proposed project would involve formal designation of a linear route with posted road signage and be nationally advertised and promoted as an adventure touring route for highway licensed Off Road Vehicles on the DNR, National Off Highway Vehicle Conservation Council (NOHVCC) and Off Roading Club websites and on social media across the country. The potential effect would be for a substantial increase of vehicle traffic concentrated on a specific route, especially in more remote pristine areas of MN such as the Superior National Forest and near the Boundary Waters Canoe Area Wilderness.

The designated nature of this touring route, with national advertisement via the DNR and NOHVCC websites, road club websites and social media across the country, mapping and signage, will result in substantially increased traffic on historically low volume roads that were not engineered to current standards with water protection in mind or routed for more intensive two-way touring use with Off Road Vehicles.

The NOHVCC information material on the proposed route has photos illustrating how they envision the route being used. These photos show multiple drivers in a row going down narrow, single lane unpaved roads. (Doc. 5) pgs; 223-229 The NOHVCC, out of Great Falls, Montana, is already promoting the route on its website that also listed its 2019 Annual Conference in Reno, Nevada. (Doc. 5A) pg. 230.)

The U.S. Fish and Wildlife Service voiced its concerns to the DNR, in March 2017, about the designated route having the potential for attracting exactly these kinds of OHV packs and caravans. (Doc. 6) pg. 231

Packs and caravans are not uncommon for this sport and include popular organized events. Jeep Jamboree USA events average 100 vehicles with over 500 participants.

Based on this website's National Directory listing of 4x4 Clubs, there are hundreds of Clubs in the U.S. that could receive and post national promotion of the Route on their club websites. <http://www.offroaders.com/4x4-trails-/4x4-clubs/>

The amount of additional traffic in coming years has the significant potential to be substantial and will continue to grow as routes are planned and added. This needs to be understood and reviewed so the impacts can be prevented and Best Management Practices applied to the 764-mile route, which is the standard laid out in the Minnesota Environmental Policy Act.

Without adequate guaranteed long-term funding identified for the following, the proposed route cannot be sustainable:

1. road maintenance and repair;
2. professional full-time staff to monitor and manage the spread of invasive species;
3. professional full-time staff to monitor waters annually that would be traversed by the route on unpaved roads; and
4. sufficient law enforcement oversight, covering the entire 764-mile proposed route, to ensure the safety of both users and non-users and compliance with staying on the road to prevent added environmental harm.

Vehicle impacts: Many studies have been conducted linking OHV/ATV use with environmental damage. These studies find that vehicle horsepower, weight and tire tread configuration correlate directly with increased levels of soil disturbance, rutting, and ultimately erosion and sedimentation to waters. Impacts include noise disturbance, damage to vegetation, increased runoff, soil erosion, and degradation of water quality. Wildlife also suffer from all of these impacts.

This is supported with data in the material section. Applying what we know about OHV/ATV use to the Border to Border Touring Route project, and with studies in the following material evidence section, we can draw rational conclusions about the impact that off-road vehicles will have in this application.

A typical ATV weighs 400 to 500 pounds with up to 50 horsepower or so, while a highway licensed vehicle set up for off-roading, such as a Jeep Wrangler, weighs 4,000 pounds and will have upwards of 300 horsepower. Off-road vehicles are larger and more powerful than ATVs, with increased clearance and better handling which enables them to be operated with greater impact to the environment.

The shear forces on the soil are orders of magnitude greater than with an ATV, and we already know the impacts that ATV use have on the environment, water, aquatic and wildlife from evidence published in reports and studies. (Doc 6A) pg. 231 A

Therefore, it is reasonable to conclude that off-road, vehicle use on these roads will result in significantly increased rutting, compaction, soil erosion, fugitive dust pollution and sedimentation degradation to waters, in comparison to current use.

The result ? Increased water sedimentation (direct correlation to increased soil erosion) in many locations where the proposed route would intersect existing high-quality waters.

Sedimentation pollution is recognized as a top cause of water impairment by the US Environmental Protection Agency and the greatest polluter of forest streams by the US Forest Service.

https://cfpub.epa.gov/npstbx/files/ksmo_sediment.pdf

<https://www.fs.usda.gov/treesearch/pubs/34119> (Doc. 7 B) pg. 234B

Road Design Standards and Change in Existing Use:

The route is being billed as an "Adventure Touring Route" for highway licensed Off Road Vehicles, utilizing almost exclusively unpaved roads. In the Superior National Forest, some of the U.S. Forest Service roads are not constructed and maintained to any environmental protection standard, have poor drainage, problematic stream crossings and buffers, and are single lane roads. Many of the roads on the proposed route are located in low population density areas and historically have very to extremely low volume traffic. They were not routed, constructed, nor maintained in anticipation of becoming a nationally advertised, designated touring route for high impact vehicles.

U.S. Forest Service Operational Maintenance Level 2, single lane, unmaintained roads are classified and assigned for low level traffic and **dispersed** recreation as noted in the 2008 USFS Forest Wide Travel Management Project. (Doc 91) pgs. 410-11

We maintain therefore, that this proposed project is a change in the existing use of these road types.

Note: The proposed route is for 2-way traffic. Typical full-size vehicles using this route will employ high clearance suspensions and larger tires and/or more aggressive tire treads which cut more deeply into the road surface for better traction.

Poorly drained native soil roads when wet are subject to increased levels of rutting, soil erosion and sediment run-off into adjacent streams and riparian areas. Two full sized vehicles passing one another on a single lane road and on some two-lane roads, would necessitate one or both vehicles going off road. The consequent environmental impacts include crushing native vegetation (including endangered species), spreading invasive species, increasing soil erosion and sedimentation to waters.

Inadequate buffer zones occur at water crossings and along roadside lakes and wetlands. The proposed project does not describe rerouting existing roads to provide any measure of mitigation by increased distance or special treatments of the margin between the traffic surface and natural water bodies, streams, lakes or wetlands along the proposed route. Assessment of potential impacts of this "no-designed buffer" approach to routing the project would be an important component of the requested EAW.

Using by design, existing roads that are almost all unpaved and that were built long before the science of road ecology and environmental concerns existed, and that were not designed for higher volumes of higher impact recreational uses, has its advantages in keeping project costs low and attempting to avoid mandatory environmental review. However, this tactic also has inherent limitations that limit, if not preclude, rerouting to paved roads to minimize water quality or other natural resource impacts.

Climate change impacts and exacerbation of potential environmental damage is a significant factor in reviewing the proposed route and impacted natural resources. Extreme rain events, as well as prolonged dry spells, are occurring with more frequency in northeast Minnesota – as well as all of Minnesota - as climate change occurs. This factor intensifies the anticipated environmental impacts; in particular rutting, increased run off, soil erosion and sedimentation and fugitive dust pollution to waters. **The greatest sediment yields occur when trails are wet.** (Wilson and Seney, 1994. (Doc. 7A) pg. 234A

The U.S. Forest Service and DNR have acknowledged the of lack of funds for road maintenance, road closures for seasonal wet periods and flash rain events, as well as invasive species monitoring and management, which constitute an overarching significant threat to any environmental sustainability of the route:

1. U.S. Forest Service, in the 2015 Forest-Wide Travel Analysis Report, acknowledged:

"At current funding levels roads cannot be maintained to standard and the Forest is not able to meet Forest Plan Desired Conditions of Providing safe traveling conditions for the public. The Forest recognizes that the trend of decreasing funding will most likely continue." In 2015, the Forest was receiving 30% of the funds needed for basic road maintenance of Superior National Forest and that It lacks the funds to properly maintain roads for public safety. (Doc 89) pg. 408

2. DNR. Invasive Species Account: The 2017 Annual Budget report states under Forecast:

"The fund balance has been declining for many years due to appropriations exceeding revenues. Each year DNR ensures a positive balance by reducing expenditures." The 2018-2021 projections estimate a one million dollar deficit by 2021. (Doc. 8) pg. 235

Environmental Effects Due to Increased Vehicle Traffic

The information cited above provides a logical, fact-based case for why this proposed project is expected to directly correlate to environmental harm. Below are the resulting negative impacts to the environment that would naturally flow from this multi-phase project and other issues of environmental concern.

A. Water Pollution.

1. Forest and Stream Sedimentation.

Numerous watersheds, the Boundary Waters Canoe Area Wilderness and Lake Superior, (which itself is already monitored for sediment plume pollution), are at risk for sedimentation impacts from this project due to the waters crossed on unpaved roads that pour into them. The designated touring route impacts the following major drainage basins:

1. Great Lakes
2. Rainy River
3. Upper Mississippi River
4. Red River of the North

All watersheds within these basins are connected downstream. There would be both direct and indirect cumulative impacts of this project on many waters in these major basins which encompass multiple surface water watersheds that are all traversed on unpaved roads.

Sedimentation, as noted, is a top cause of water impairment per Environmental Protection agency and of forest stream pollution per the US Forest Service.

https://cfpub.epa.gov/npstbx/files/ksmo_sediment.pdf

<https://www.fs.usda.gov/treesearch/pubs/34119> (Doc. 7B) pg. 234B

The effects are wide-ranging. Wild trout populations and other stenothermic fish species require clear, cold waters with high oxygen levels to survive. Sedimentation causes increased turbidity, reduced dissolved oxygen and increased temperature. Increased runoff of warmer waters and increased sedimentation have the significant potential to increase water temperatures by 1-4 degrees F, stressing brook trout and ultimately threatening survival. (Docs 57 & 58) pgs. 358-360

Over the course of the touring route in the Lake County alone, and offered as the proxy portion impacted for purposes of this petition, the number and type of streams that would all be crossed on unpaved roads are: (See Maps pgs. 75 & 80-83)

thirty-one (31) different streams in total, crossed 63 times:

27 of these are Mn DNR designated trout streams, crossed 61 times, with a portion of the route being on unmaintained, unpaved forest service roads with inadequate buffer zones

9 of these are "Exceptional" MPCA ranked streams, crossed 24 times

3 of these are "Prohibited Protection" MPCA ranked streams, crossed 8 Times

Note: the Mn DNR Proposal for the Border to Border Touring Route Project Summary states the route would cross "several" designated trout streams. (Doc 1C) pg. 215M

The Lake Superior, Red River of the North, and the Rainy River Watershed are noted for exceptional water quality.

2. Rainy River Headwaters Watershed.

The Minnesota Pollution Control Agency stated that the majority of the waterbodies within the Rainy River watershed have exceptional biological, chemical and physical characteristic that are worthy of additional protection. The substantially undeveloped watershed is undoubtedly a key reason for the high water quality found in the majority of the Rainy River-Headwaters Watershed.

<https://www.pca.state.mn.us/sites/default/files/wq-ws3-09030001b.pdf>

(Docs. 21 & 22) pgs. 273-4

Overall lakes and streams within the Rainy River-Headwaters Watershed have benefited from little development pressure. However, these systems are highly sensitive to anthropogenic stressors like most waterbodies in Northern Minnesota. A continued vigilance is necessary to monitor areas where developmental pressures will or are expected to occur. Point and non-point pollutants are affecting water quality.

<https://www.pca.state.mn.us/sites/default/files/wq-ws3-09030001b.pdf> (Doc. 23)

pg. 275

3. Fish & macro-invertebrates.

Due to increased soil erosion and sedimentation, the project has the significant potential to adversely impact sensitive aquatic species, six (6) species of state listed "special concern" in the Rainy River Headwaters Watershed and insects reliant on cold clear water, such as stoneflies and caddisflies, and, specifically, the dragonfly *Boyeria grafiana*, which is a state listed species of special concern. (Doc. 67) pg. 375

Tire chemical contaminant:

Scientists have discovered that a highly toxic car tire chemical (6PPD-quinone), from bits of tire that are shed in transit and end up in waters, are killing Coho salmon.

Tires containing zinc have also been known to harm wildlife.

Steelhead trout, which are found in Lake Superior and spawn in the large northern streams, and Chinook salmon, exhibit some sensitivity to tire rubber chemicals.

This factor alone, with an increase in high impact traffic on historically low trafficked roads with insufficient buffer zones, or in combination with other the factors of sedimentation and fugitive dust pollution, risk impacting steelhead trout spawning in streams. Further study is required. (Doc 23A) pgs. 275 A-G & (Doc 23B) pgs.275 H & I

4. Sediment load pollution to “exceptional” MPCA-ranked waters.

The route in the Lake County proxy crosses **nine “exceptional” MPCA- ranked streams** on unpaved roads, many with insufficient buffer zones. These are: Little Isabella River, Mitawan Creek, Jack Pine Creek, Arrowhead Creek, Houghtaling Creek, Two Island River, Manitou River, East Branch Baptism River and West Branch Baptism River. (See maps pgs. 80-83).

<https://www.pca.state.mn.us/sites/default/files/wq-ws4-51a.pdf> table 10 pages 44-46 of pdf

<https://www.pca.state.mn.us/featured/northeastern-minnesota-treasures-now-known-excellent-water-quality-too>

5. Sediment load pollution to “prohibited protection” MPCA ranked streams in the Rainy River Watershed.

“Prohibited protection” MPCA ranked streams are designated to receive no increase in loading and no added amount of pollutants. The project, which would cross **three** “prohibited protection” streams in the Rainy River Watershed, has the significant potential to result in a significant increase in erosion and sedimentation to streams due to both the potential for significantly increased traffic of a designated, signed and nationally advertised OHV route and from the increased erosion caused by more aggressive OHV tires. These streams are: Little Isabella River, Inga Creek, Mitawan Creek and the Boundary Waters Canoe Area Wilderness (BWCAW).

<https://www.pca.state.mn.us/sites/default/files/wq-s6-46f.pdf>

Rainy River-Headwaters Watershed Monitoring and Assessment Report ([wq-ws3-09030001b](https://www.pca.state.mn.us/sites/default/files/wq-ws3-09030001b))

6. Sediment load pollution to “prohibited outstanding value resource waters” – BWCAW.

Minnesota Rule 7050.0335, Subpart 3 designates waters within the BWCAW as “prohibited outstanding resource value waters.” The proposed route crosses rivers and streams on unpaved roads that either feed directly into the BWCAW or cross tributaries that feed into streams which, in turn, drain into the BWCAW. (see pg. 91 & maps pgs. 92-94) <https://www.revisor.mn.gov/rules/7050.0335/>

The proposed route would pass as close as one and one quarter miles to the BWCAW, crossing 16 different streams 29 times. (see maps pgs. 92-94)

In addition, The Prospector Loop ATV system, opened its first portion of 130 miles in June 2020 and traverses the same remote region of the SNF as the proposed B2B.

In some cases, it is on the same roads, in the same close proximity to the BWCAW and crosses the same protected and high-quality streams flowing into the BWCAW, potentially carrying sediments and spreading invasive species. In addition, this Prospector Loop ATV Route would further concentrate increased recreation on OML 2 roads that are minimally or totally unmaintained and classified by the Forest for dispersed recreation.

Dave Soular of Babbitt, Mn. who maintains 60 miles of the Prospector Loop route states :

“Maintenance is a big issue, especially with the new machines. They have so much power they can really tear up a trail if people aren’t careful.”

<https://www.duluthnewstribune.com/sports/outdoors/6553132-New-Prospector-ATV-spur-joins-growing-Northland-trail-network> (Doc. 5B) pgs. 230 A-D

The Prospector’s Loop crosses 9 of the same streams as the proposed B2B: Little Isabella River, Inga Creek, and Mitawan. It also crosses Nip Creek, Snake Creek/River, Jack Pine Creek, Arrowhead Creek, West Camp, and the Dumbell River. Map. (Doc 5C) pg. 230 E

The project proposers have not studied these environmental impact risks, which could be determined as part of environmental review.

7. Roadsides: wetlands, pollinator refuge & vegetation damage.

The Minnesota Environmental Quality Board states in its 2017 Minnesota Environment and Energy Report Card that the biggest threat to wetlands are practices on land that cause degradation of water quality and natural vegetation and the invasion of exotic species. (Doc. 10A) pg. 243A

Roadsides and ditches with a rich diversity of native plants support more pollinators, among which bees are considered the most important pollinators. Pollinators are an essential part of any terrestrial ecosystem. Their basic habitat needs- flowers for nectar and pollen and a place to nest and breed can be successfully provided for on roadsides. Pollinators also sustain wildland plant communities that provide food for a myriad of wildlife. Roadsides provide refuge for pollinators and in some cases they support plant communities that can no longer be found elsewhere. 70% of bees are ground nesting.

High impact vehicles traveling on the narrow or single lane unpaved roads of the proposed Border to Border alignment, would have to go off road to pass one another. In so doing, they could easily crush and collapse existing bee colonies, as well as destroy pollinator habitat. Two of the leading causes of the noteworthy pollinator decline in the US are habitat loss and spread of invasives.

https://www.fws.gov/southwest/es/Documents/R2ES/Pollinators/7-PollinatorsAndRoadsides_Guideline_Xerces_2014.pdf

(Doc 102) pgs. 430 H-O

Primitive, unpaved single-lane roads or unmaintained Operational Management Level 2 Forest Service roads, that would require vehicles to go off road to pass each other, have the significant potential to increase sediment loading to wetlands, spread non-native invasive species, and crush vegetation.

Particularly on narrow single lane roads with little or no shoulders, full-size vehicles traveling in opposite directions in order to pass one another will be encroaching on the buffer, damaging vegetation and further depleting an already insufficient buffer to adjacent riparian areas.

Note: U.S. Forest Service Operational Maintenance Level 2, single lane, unmaintained roads are classified and assigned for low level traffic and **dispersed** recreation as noted in the 2008 USFS Forest Wide Travel Management Project (Doc 91) pgs. 410-11

8. Wild Rice Lakes (Map with route overlay, pgs.103-4.)

The proposed route would travel through four of the twelve (12) counties in Minnesota where sensitive wild rice lakes remain: Lake County, St. Louis, Itasca and Beltrami.

In Lake County, the proposed route would travel by several wild rice lakes, risking water degradation to these sensitive lakes.

Our concern is that adequate buffer zones are in place, 300-feet Best Management Practice, to provide adequate protection from significant impacts of sedimentation and invasive species spread from an increase in highway licensed, high impact OHV traffic on unpaved roads. (Doc. 88A) pg. 407

These buffer zones by wild rice lakes should be reviewed and re-routing done if found insufficient to avoid fugitive dust pollution and sedimentation from an increase in high impact traffic on unpaved roads.

9. Lakes of Biological Significance (Map with route overlay pgs.107-8).

The proposed route in Lake County would travel by several lakes of biological significance. Our concern is that adequate buffer zones are in place, 300 feet Best Management Practice, to provide adequate protection from significant impacts of sedimentation to waters and the spread of invasive species due to an increase in highway licensed, high impact OHV traffic on unpaved roads. Adequate buffer zones should be confirmed on site.

B. Fugitive dust.

1. **water pollution:** Wind-borne dust migration from vehicle traffic has been shown in a study to travel 100 meters (325 feet) from vehicles. (Doc. 50) pg. 322. This fugitive dust pollution can land in waters, harming aquatic life and habitat, as well as,
2. **plant life:** Dust accumulation on plants can affect photosynthesis and transpiration, reducing growth, recruitment, cover and survival. (Walker & Everett, 1987.)
3. **air quality:** An increase in OHV traffic on unpaved roads will result in an increase in fugitive dust pollution and haze, and negatively affect the air quality for both humans and wildlife. (Photo, pg. 71.)
4. The potential for the designated route to result in vehicle packs and caravans, as well attract the popular Jeep Jamboree events, such as Jeep Jamboree USA, has the potential to substantially increase traffic and fugitive dust pollution. (Pgs. 122-125)

This requires study and understanding prior to moving ahead with the project.

C. Fire damage.

According to the U.S. Forest Service, vehicles cause more acreage burned than any other equipment. (Doc 9A) pgs. 236-238 & (Doc 9B) pg. 239

The project utilizes roads that traverse remote portions of the Superior National Forest and skirts within 1-2 miles of the Boundary Waters Canoe Area Wilderness. This boreal forest region is historically at risk for wildfires even with low traffic levels. Hot exhaust pipes on dry grasses or brush can start fires.

Climate change induced droughts would combine to heighten this increased risk of forest fire. <https://www.fs.usda.gov/detail/r8/home/?cid=fseprd534853>

D. There is no permanent monitoring or mitigation plan developed for the impact to waters, invasive species spread, enforcement oversight, endangered and threatened aquatic and wildlife, habitat destruction and biodiversity loss, nor an ongoing guaranteed, permanent source of funding in place to make the route sustainable.

E. Ecosystem Destruction, Areas of High and Outstanding Biodiversity, Biodiversity Loss. (Map overlay, pages 141-142.)

The proposed route in Lake County travels through significant stretches called ecological Outstanding Biodiversity sites, as well as some that are High Biodiversity sites.

Ranking is based on the size and condition of native plant communities and how they fit in an ecological landscape. It also includes the presence or absence of rare species populations. The rankings are 'outstanding', 'high', 'moderate' and 'below'. Ecologists with the Minnesota Biological Survey determine this status. This ranking is used to help prioritize Natural Area protection efforts.

Biodiversity helps entire ecosystems maintain a high degree of resilience needed to cope with the disturbances of climate change.

https://www.dnr.state.mn.us/eco/mcbs/biodiversity_guidelines.html

(28) & (29) pgs. 463-466

The Minnesota Department of Transportation states:

Minnesota's transportation system directly impacts the state's wildlife and habitat resources. As the state experiences global trends like pollinator and species decline, it is important the transportation-decision makers consider ecosystem health. Understanding the challenges and opportunities associated with biodiversity could help protect native plants and animals and protect the habitat that supports them.

Of the over 2,000 known native wildlife species in Minnesota approximately 346 are considered Species in Greatest Conservation Need because they are rare, declining or face serious threats that may cause them to decline. Habitat degradation is one of the leading stressors of Species in Greatest Conservation Need.

<https://minnesotago.org/trends/biodiversity> (Doc. 9C) pg.239A

The proposed project poses significant risk for habitat or ecosystem fragmentation, fugitive dust pollution, noise pollution and invasive species spread, all of which have the significant potential to negatively impact aquatic and terrestrial species.

These risks stem from the potential the project has to negatively impact their habitat, food sources, breeding grounds, migrations and reproduction rates.

Environmental review is needed to determine that extent to which Group/OHV events, with high numbers of vehicles in remote areas, would have a more harmful impact on wildlife than the historical dispersed, low volume traffic use.

F. Highest Conservation Prioritization Areas and Degradation. (MAP overlay pages 144-146.)

The proposed route would cross through areas designated Highest and High Conservation Prioritization areas. (See Map overlay, pgs. 144-146). These areas provide resilience to native communities in the face of climate change impacts. These Conservation Prioritization areas are large areas and corridors that provide pathways for species to migrate to more suitable habitats and to preserve a greater variety of habitats for desirable species.

An increase of high impact traffic in these areas would be in direct conflict with the purpose of these Conservation Prioritization areas to serve as pathways for species migration for climate change.

In addition, an increase in high impact OHV traffic on unpaved roads would increase the risk of invasive species spread to these areas that are designated to preserve a greater variety of habitats for species to survive the effects of climate change. Invasive species can take over and destroy habitat, destabilizing entire ecosystems. (29) pgs. 464-466.

G. Spread of Invasive Species. (See maps with route overlay & text, pg. 135.)

The Superior National Forest states the region has not been hurt as much as other parts of the Midwest by invasive plants — yet. The agency stresses that preventative measures are much easier and more efficient than trying to get large infestations under control. (Doc.10) pgs.240-243

The proposed project, which would cross the entire state and attract vehicles and off roading clubs from around the country and Canada with national advertising, has no provision for AIS inspection stations, wash stations and no added full time professional staff to monitor and control invasive species.

The concept of corridor as the means for introduction, establishment, spread, and re-introduction of invasive species is a well-documented concern. It certainly remains a legitimate one for this type of project and one for serious review given the ability of invasive species to degrade habitat and destabilize entire ecosystems.

The increased traffic from a designated route that is nationally advertised, means MORE invasive species are constantly being introduced, on top of ongoing and spotty efforts to control what is already there.

There are continual, but limited right-of-way invasive treatments along all road jurisdictions (state, county, township, USFS, DNR, etc.), as managers do what they can to control them. All of these efforts are limited by funding, prioritized by hotspots, never completely remove established invasive species, and need to be repeated every year.

Increased vehicular traffic, both on and off road, presents a unique conservation challenge in terms of preventing and managing the spread of non-native and invasive plant species that threaten wildlife food sources, habitat and overall ecological health.

This complete lack of strategic planning with environmental review of the proposed route, and the lack of secured long term funding to manage the proposed route's significant potential of long range impacts of seed dispersal with the ability to spread invasive species across the entire state, is in direct conflict with the most recent Federal fund grants of \$78,000 to Cook and Lake Counties to control invasive species.

From the Quetico Superior Wilderness News 7/24/20:

"Organizations along Minnesota's Lake Superior north shore will receive grant funds from the U.S. Forest Service to combat exotic plant infestations ...The goal of the grant program is to "detect, prevent, eradicate, and/or control invasive plant species to promote resiliency, watershed stability, and biological diversity on Federal, State, or other public or private land ...

"Invasive plants can have numerous deleterious effects on the ecosystem, including driving out native plants, increasing erosion, and otherwise disrupting the ecosystem

"But several invasive plants have infested the region, and keeping them under control is key ...

"But most long distance spread is caused by humans, who can transport seeds on clothing, equipment, vehicles, or pets. Residents of and visitors to northern Minnesota are encouraged to always ensure they are not unwittingly transporting these plants to new locations." (Doc.10) pgs. 242-243

Although all vehicles can transport seeds, highway licensed OHVs, unlike regular passenger car traffic, can and do travel off road and pass through large areas of vegetation that include non-native invasive species, lodging invasive species and their seeds in tires and under carriages. Off Highway Vehicles can scarify the soil with aggressive treads, creating microsites for plant establishment, while also carrying this abundant seed of potentially non-native origin that can be dropped into these microsites.







Studies show that vehicles that travel great distances on unpaved roads provide a potential risk for new invasions. In this study of vehicle types and seed accrual rate, it notes that 4Wheel Drive vehicles accrued 420 seeds per 100 km on dry unpaved roads, and **19.6 fold more on wet unpaved roads, 8,232 seeds.** ([Hitching a ride: Seed Accrual rates on different types of vehicles.](#)” Journal of Environmental Management, Vol. 206, pp. 547-555, 2017. (21) pgs. 437-445

The proposed nationally advertised, designated route will bring traffic from outstate which can spread non-native species from other parts of the country and Canada. The route crosses 4 biomes within Minnesota itself, also increasing the potential of spreading invasive species across the state from vehicles originating within Minnesota, as well as the effects of invasive spread on: wildlife food source impacts; species habitat destruction; and biodiversity and ecosystem destruction.

Spotted Knapweed, Canada Thistle, Common Tansy, and Purple Loosestrife are some of the greatest species of concern in Northeastern Minnesota. Garlic mustard is moving north in Minnesota and is a serious threat to native plant species, overtaking forest floors. These are prohibited noxious weeds to be controlled; meaning efforts must be made to prevent the spread, maturation and dispersal of any propagating parts, thereby reducing established populations and preventing reproduction and spread, as required by Minnesota Statute 18.78.

1. Spotted knapweed: A single plant can produce over 1,000 seeds. The seeds can remain viable in the soil for over 5 years. The plants have few predators and are unpalatable to grazing animals. It produces a toxin called catechin in its foliage and roots which retards the growth of surrounding plants, allowing it to spread more rapidly and form monocultures. Because of its high competitive ability, spotted knapweed can dominate an area, leading to a reduction of species diversity. (13) pg. 432

www.plants.usda.gov/plantguide/pdf/pg_cest8.pdf

Invasive plants such as spotted knapweed have overrun vast areas of the United States to the detriment of native plants and wildlife. (14) pg. 432.

www.fs.fed.us/research/highlights/highlights_display.php?in_high_id=403

2. Canada Thistle: It is highly invasive, degrades wildlife habitat, and can hinder reforestation and landscape as it creates thick, impassable stands. Seed can be spread over wide distances when it adheres to the surfaces and undercarriages of road vehicles. (12) pg. 432 & (23) pgs. 447-48

www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5410109.pdf

Canada thistle is extremely difficult to kill. Seed can survive in soil for up to 20 years. Its prickly flowers and leaves are unsuitable for grazing. (Ross and Lembi, 1999). A seedling can reproduce vegetatively in as little as 6 weeks after germination, and a single plant can develop a lateral root system with a 20-foot spread in a single season (23) pg. 433 & pgs. 447-48

3. Common Tansy: Can be transported by vehicles that have been in infested areas. Seeds can remain viable for up to 25 years. Common tansy often infests disturbed sites such as roadsides. Tansy forms very dense patches that crowd out native plants that are wildlife food sources. It can clog drainage ditches, restricting the flow of water. It may threaten the ecological health of areas through reduction of wildlife habitat and species diversity. (9) & (10) pg. 432

www.bcinvasives.ca/invasive-species/identify/invasive-plants/common-tansy

www.invasive.org/weedcd/pdfs/wow/common-tansy.pdf

4. Garlic Mustard: This is a challenging and expensive invasive to manage. (27) pg. 461. The tiny seeds are easily spread by birds or through human vectors such as logging equipment or recreational vehicles. It can quickly take over the forest floor, overwhelming native plant species and altering habitat and food sources for wildlife and insects. (24) pg. 433 & pgs. 449-451.

http://nyis.info/invasive_species/garlic-mustard/

5. Purple Loosestrife: This aggressively invades lakes, rivers, wetlands, creates large monocultures and significantly decreases the biological diversity of native plant and wildlife populations. It is found throughout Minnesota. (24A) pgs. 451A-B & (24B) Pgs. 451 C-E

<https://www.mda.state.mn.us/plants/pestmanagement/weedcontrol/noxiouslist/purpleloosestrife>

One adult plant can produce 2.5-2.7 million seeds annually. These seeds are the size of ground pepper grains and are viable for many years. They are easily dispersed and transported by water, wind, boats, boat trailers and car tires.

It can tolerate a wide range of environmental conditions and can establish itself in a variety of substrates including gravel, sand clay and organic soil. It has no natural predators such as disease or insects on this continent; therefore, it has an incredible ability to out-compete native vegetation and to form dense stands.

Purple loosestrife eliminates food, nesting and shelter for wildlife. It can diminish recreational values of hunting, boating and fishing which may in turn hurt local economies. (24B) pgs. 451C-E

<https://www.des.nh.gov/organization/commissioner/pip/factsheets/bb/documents/bb-45.pdf>

Chemical Herbicide effects

Control of invasive species, after introduction by the project, is likely to involve use of chemical herbicide not presently being applied along the proposed route. Impacts on native species, pollinators and water resources along the route would need assessment in the requested environmental review process.

H. Climate Change

1. Importance of The Boundary Waters Region

The Director of The University of Minnesota Center for Forest Ecology, Lee Frelich, says change is already being documented in the Boundary Waters region. Cold water fish are also showing signs of change and researchers note that the Boundary Water lakes and northern waters could be a refuge for these species in the future. Therefore, it is critical to protect the water quality of our pristine cold-water streams and lakes. (Doc 98) pgs. 426-428

<https://queticosuperior.org/blog/climate-change-northwoods-part-ii-...>

The proposed route would traverse this region and cross waters on unpaved roads. Increased sedimentation and fugitive dust pollution from the increased high impact traffic that has the significant potential to create turbid water, which increases water temperatures that do not support cold water species such as brook trout.

<https://www.pca.state.mn.us/sites/default/files/wq-ws4-51a.pdf> (Doc 51) pgs.334-35

Rising temperatures have evaporated more water into the air, providing additional fuel for our largest rainstorms. Since 2000, Minnesota has seen 7 catastrophic “ mega-rain events. With more warming expected, Minnesota should be prepared for a continued increase in these devastating storms. (Doc. 10D, pg. 243 E.)

<https://www.eqb.state.mn.us/2017-environment-and-energy-report-card>

Sudden severe rain events, which northeastern Minnesota is already seeing, will become more frequent and further increase erosion and rutting on the proposed route's unmaintained, unpaved roads, with the potential to significantly increase sediment load to streams and wetlands.

2. Importance of Northeastern Minnesota

Half of the proposed Border to Border route traverses Northeastern Minnesota.

A recent analysis published by The Nature Conservancy found that Northeastern Minnesota will be critical in climate change. Nature Conservancy scientists, and over 150 scientists from agencies, academia and NGOS across the United States, identified and mapped over a ten-year period a resilient and connected network of lands that will allow species to adapt to climate change impacts and thrive.

The study determined that the northeastern tip of Minnesota will be a critical area for maintaining habitat connections in a changing climate. Northeastern Minnesota is identified as a “Climate Flow Zone with Recognized Biodiversity.” It is categorized as a climate flow zone with known locations of rare species or unique communities. (Doc 98 B) pgs. 428 D-G

Roads create fragmentation and create barriers for movement. “In climate change, species need to be able to move, said Jim Manolis of The Nature Conservancy.” (Doc 98 A) pgs. 428 A,B,C

All of the increased environmental impacts of the proposed route due to an increase of high impact traffic would make ecosystems more vulnerable to threats from climate change and put rare species or unique communities at risk.

As the Minnesota Environmental Quality Board states:

“Climate has a strong influence on Minnesota’s wildlife and native plant populations. Historical records show that temperature and precipitation patterns in Minnesota are changing. These changes have both direct and indirect impacts on fish, wildlife and plants.

The stress of climate change on Minnesota’s fish, wildlife and plants is further increased by continued introduction of invasive plants and animals that are not native to Minnesota, fragmentation of large habitat areas into smaller, less connected habitats, conversions of natural areas into developed lands and croplands, pollution from our cities, **roads** and croplands that runs off into our lakes, streams and rivers.”

<https://www.eqb.state.mn.us/2017-environment-and-energy-report-card>

(Doc 10E) pg. 243F

3.Climate Change and Greenhouse Gas Emissions

As stated by the EQB in its 2017 Minnesota Environment and Energy Report Card, "The state as a whole is facing costly infrastructure damage, loss to winter tourism, as well as a cascade of effects on agriculture, natural resources and wildlife. To help stabilize the climate, Minnesota needs to continue to reduce greenhouse gas emissions by using fewer fossil fuels and protecting carbon stored in trees and soils. Action to mitigate climate change requires ongoing efforts at global, federal, state, community and household levels." (Doc 10B) pgs. 243 B

As stated in the 2019 MPCA Greenhouse Gas Legislative Report:

"Our personal choices have an impact on emissions. On road vehicles are the largest category of greenhouse gases within the transportation sector.

"Minnesotans are choosing to drive larger, less efficient, more polluting vehicles instead of smaller, more-efficient cars. Minnesotans are also driving more miles in larger vehicles. The trend towards larger vehicles and more miles traveled is preventing more significant emissions reductions in the transportation sector." (Doc10C) pgs. 243 C&D

The DNR must study the anticipated impacts of additional greenhouse gas emissions from the increased traffic volume of high impact vehicles on the proposed, designated, and nationally advertised route.

The Environmental Quality Board in its own report to the Legislature states that to stabilize the state's climate, a reduction in greenhouse gases requires active participation from the Federal, State, to community and individual levels. Therefore, we state it is the role of the DNR to estimate the metric tons of greenhouse gases the proposed route would contribute to the annual, cumulative greenhouse gas emissions in Minnesota and its anticipated effect on climate change, and to target how much and where the DNR can contribute to greenhouse gas reduction from this and other projects to help meet the legislated state goals.

This should include a study on the multiple climate change effects caused by greenhouse gas emissions and how they would impact water quality, aquatic and wildlife and habitat. The most recently available figures from the Minnesota Pollution Control Agency show that in 2016 passenger cars emitted 8 million metric tons of greenhouse gas emissions into the atmosphere and light duty trucks emitted 15 million metric tons of greenhouse gas emissions.

<https://www.pca.state.mn.us/air/greenhouse-gas-emissions-data>

4. January 2019 MPCA Report--Greenhouse gas emissions in Minnesota

The Biennial report to the Legislature tracking the state's green house to emissions contributing to climate change states:

The trend towards larger vehicles and more miles traveled is preventing more significant emissions reductions in the transportation sector. This sector will require ongoing, focused effort to reduce emissions to the levels necessary to meet our goals.

“Our personal choices have an impact on emissions. On-road vehicles are the largest category of greenhouse gas emissions within the transportation sector. Federal regulations have resulted in newer vehicle models that are generally more fuel-efficient and therefore produce fewer GHG emissions than older, similar vehicles. However, at the same time Minnesotans are choosing to drive larger, less- efficient and more-polluting vehicles instead of smaller, more-efficient cars. Minnesotans are also driving more miles in those larger vehicles. While federal fuel efficiency standards are putting downward pressure on vehicle GHG emissions, the trend towards larger vehicles and more miles traveled is preventing more significant emissions reductions in this sector.”

<https://www.pca.state.mn.us/sites/default/files/lraq-2sy19.pdf>, page 7

https://ipbes.net/sites/default/files/ipbes_global_assessment_chapter_2_1_drivers_united_31may.pdf (pg 17 of pdf)

The IPBES Global Assessment on Biodiversity and Ecosystem Services

36. Climate has changed since pre-industrial times due to anthropogenic activities and has influenced impacts, on nature and society, of many other critical drivers (well established). Anthropogenic activities – in particular those raising greenhouse-gas emissions – are estimated to have caused approximately a 1.0°C warming by 2017, versus pre-industrial times, with ~0.2°C ($\pm 0.1^\circ\text{C}$) rises per decade. The fastest changes are observed in flat landscapes at higher latitudes {2.1.17}. The frequency and the magnitude of extreme weather events both have increased across the last five decades, while the global average sea level rose at a rate of over 3 mm yr⁻¹ over the last decades {2.1.12, 2.1.17}. Greenhouse-gas emissions are increasing fastest in the upper-middle-income countries and the Asia-Pacific region. In 1980, high-income countries were highest but emissions are decreasing in these regions with changes in behavior, due to perceived threats, plus responses in governance and innovation – as well as some shifts in emissions to other countries {2.1.17}.

<https://www.nytimes.com/2019/05/06/climate/biodiversity-extinction-united-nations.html>
New York Times, 5/6/2019

Humans Are Speeding Extinction and Altering the Natural World at an 'Unprecedented' Pace

"And with humans continuing to burn fossil fuels for energy, global warming is expected to compound the damage. Roughly 5 percent of species worldwide are threatened with climate-related extinction if global average temperatures rise 2 degrees Celsius above preindustrial levels, the report concluded. (The world has already warmed 1 degree.)"

Legislative charge

Minn. Stat. § 216H.02 Greenhouse gas emissions control.

"Subd. 1. Greenhouse gas emissions-reduction goal. It is the goal of the state to reduce statewide greenhouse gas emissions across all sectors producing those emissions to a level at least 15 percent below 2005 levels by 2015, to a level at least 30 percent below 2005 levels by 2025, and to a level at least 80 percent below 2005 levels by 2050. The levels shall be reviewed based on the climate change action plan study."

Minn. Stat. § 216H.07 Emissions-reduction attainment; policy development process.

"Subd. 3. Biennial report. (a) By January 15 of each odd-numbered year, the commissioners of commerce and the Pollution Control Agency shall jointly report to the chairs and ranking minority members of the legislative committees with primary policy jurisdiction over energy and environmental issues the most recent and best available evidence identifying the level of reductions already achieved and the level necessary to achieve the reductions timetable in section 216H.02. (b) The report must be in easily understood nontechnical terms."

I. Threatened, endangered and protected species are at potential risk with the proposed route. (See Species Maps with proposed route overlay in material evidence in the Wildlife section pgs. 160,167,172, 176 & 178)

The proposed alignment crosses or intersects known locations of the following species, travel corridors, ranges and nesting areas:

1. Canada Lynx. (Maps, with route overlay pg. 160 & travel corridors 163.)

The Canada Lynx is found in 6 of the 8 counties the proposed route would traverse. (Ref. 8) pgs. 496-502

The Canada lynx (*Lynx canadensis*) is one of the rarest wild cats in the United States. It is a "threatened" species under the Endangered Species Act.

The proposed route traverses Canada Lynx territory with the largest known population in Minnesota of the federally threatened species. Lake County is one of two counties that have the highest population in Minnesota.

The biggest threats to the Canada Lynx are habitat loss, fragmentation and the danger of roadways. <https://westernlaw.org/protecting-wildlife/canada-lynx/> (Ref 15) pg.526

The Superior National Forest is the only National Forest in Minnesota with critical Lynx habitat and it provides important habitat for lynx in the Lake States geographic area.

Because of low population density, the lynx is a federally listed “threatened” species and federal agencies must ensure that:

- a. their actions do not jeopardize the continued existence of the listed species; and
- b. USDA must maintain a viable population in the National Forest.

2. Gray Wolf. (Map with route overlay; p. 167.)

Minnesota's wolf legacy is unique: its northeastern corner of lakes and sub-boreal forest once sheltered the last remaining wild wolves (*Canis lupus*) in the lower 48 states. The gray wolf is in every county the proposed route would traverse and 5 out of the 8 counties are critical habitat for the gray wolf. (Ref 8) pgs. 496-502
<https://www.dnr.state.mn.us/mammals/wolves/mgmt.html> (Ref 16) pg. 527

Wolves need connected populations for genetic sustainability and natural ecosystems need wolves to maintain a balance of species, but today the Gray Wolf inhabits only between 10% and 20% of its historical range. It was listed as “threatened” species in Minnesota. (Ref18) pg. 534. However, the U.S. Fish and Wildlife Service published notice of the decision to delist the gray wolf in the lower 48 states, except for the Mexican Wolf subspecies. This decision will be effective on January 4, 2021.

https://www.biologicaldiversity.org/campaigns/gray_wolves/index.html

The President of the Minnesota based Howling for Wolves, Maureen Hackett stated:

“Between 2012 and 2014, wolves were removed from the federal endangered species list in Michigan, Wisconsin and Minnesota. In the two and a half ears that wolf hunting and trapping were allowed, more than a third of the region's entire wolf population was killed. If allowed to proceed unchecked, federal de-listing will doom the species' recovery.” (Ref 19B) pgs. 537 E-F

"This political decision to remove federal Endangered Species Act protections for the wolf is against public sentiment, sound science and will destroy our nation's endangered species. We need a nonlethal wolf plan and continued funding for prevention methods for farmers and ranchers to ensure an intact and healthy wolf population, because the wolf is vital for our ecology and the legacy of future Minnesotans." (Ref. 19 A) pgs. 537 A-D

The President and CEO of Defenders of Wildlife, Jamie Rappaport Clark, states that, "Stripping protections for gray wolves is premature and reckless. Gray wolves occupy a fraction of their former range and need continued federal protection to recover. We will be taking the U.S. Fish and Wildlife Service to court to defend this iconic species."

The Chippewa Forest Wolf management Recovery Plan states: "**An open, low standard woods road may have greater potential human impact on wolves than a national forest highway.**" Therefore, when considering human access and road densities, one should consider all roads and trails, not just higher standard roads. <https://www.howlingforwolves.org/sites/default/files/Wolf+Analysis+Threats+To+Wolves.pdf> (Ref. 17) pg.530

Loss of habitat and fragmentation is a threat to the gray wolf. Wolves need large tracts of land and connected populations for genetic sustainability, and natural ecosystems need wolves to maintain a healthy balance of species. The increased, high impact traffic of the proposed "Border to Border Touring Route", risks increasing road kill and habitat fragmentation for the gray wolf.

In addition, the increased noise would increase the zone of influence significantly at any one time, creating avoidance response that interferes with necessary life support activities.

- <https://www.howlingforwolves.org/sites/default/files/Wolf+Analysis+Threats+To+Wolves.pdf> (Ref. 17) pgs.528-30 & 532
- https://files.dnr.state.mn.us/fish_wildlife/wildlife/wolves/wolf_comments19.pdf (Ref. 19) pg. 536-7

3. Wood Turtle.

Conservationists consider the wood turtle (*Glyptemys insculpta*) to be one of the most endangered freshwater turtles in North America. Minnesota DNR designates it as a "threatened" species under the Minnesota endangered species law. (Ref 7) pg. 492. It is listed as "endangered" by the International Union for Conservation of Nature or "IUCN."

The proposed route would traverse two of the counties, Lake and St. Louis, where Wood Turtles are found in Minnesota.

Wood Turtles in Minnesota are known primarily from three distinct regions: (1) watersheds draining into Lake Superior in **St. Louis and Lake counties**; (2) those from Pine and Chisago counties in the St. Croix watershed; and (3) those along the Cannon and Mississippi Rivers in Rice, Goodhue, Steele, Dodge, Olmsted and Mower counties in the southern part of the state, reaching almost to the Iowa border in Mower County (Ernst 1973)

http://www.northeastturtles.org/uploads/3/0/4/3/30433006/glin_ecology_conservation.pdf
(Ref. 7A) pg. 495A

This late maturing species has low recruitment potential and is highly vulnerable to the loss of any individuals from the population.

Many adults die when crossing roads between fragmented patches of suitable habitat. "The terrestrial habits of *Glyptemys insculpta* in summer lead to road mortality as well as fatal encounters with recreational vehicles and agricultural machinery." [van Dijk, P.P. & Harding, J. 2011. *Glyptemys insculpta*. The IUCN Red List of Threatened Species 2011.

Turtles would be crossing roads in late-May and June as they move to familiar nesting locations or when newly hatched youngsters are seeking their new back water homes. This is during the driving season for the proposed, nationally advertised, designated route for high impact vehicles.

https://www.dnr.state.mn.us/reptiles_amphibians/helping-turtles-roads.html (Ref 21) pg.540

As the most terrestrial turtle in Minnesota, predators, habitat loss and road mortality have made them a threatened species in Minnesota. Being the most terrestrial turtle in Minnesota, places them at greater risk than their aquatic counterparts.

https://www.dnr.state.mn.us/eco/nongame/projects/wood_surveys.html (Ref 20) pg.538

Prime wood turtle habitat is also attractive to recreationists, leading to increased collection and road kills. (Ref 23) pg. 544

While they are a long-lived species, they face significant threats from development pressure, recreation, and degrading water quality in our river systems.
<https://www.dnr.state.mn.us/eco/nongame/projects/a-list.html> (Ref 22) pgs.541-3

Road mortality, habitat fragmentation and destruction and invasive species, nest flooding, predation and poaching result in this species that is declining across most of its range and is being considered for protection under the federal Endangered Species Act.

<https://www.dnr.state.mn.us/mcvmagazine/issues/2019/jul-aug/wood-turtles.html>
(Ref 24) pgs. 546-553

4. Bald Eagle. (See Map with route overlay - pg. 172)

The proposed route travels through Bald Eagle territory during the moderately sensitive nestling period of 4-8 weeks old and during the highly sensitive period of 8-week-old nestlings through to fledging when they are gaining flight capability. This period of nest building, hatching and rearing the young and fledging young can span the months of December to August in Minnesota. Noise disturbance from the increased traffic could cause them to flush from the nest early and die.

<https://www.dnr.state.mn.us/birds/eagles/summer.html> (Ref 25) pg. 554

The Bald and Golden Eagle Protection Act protects eagles from a variety of impacts and actions, affecting their ability to forage, nest, roost, breed, or raise young. The U.S. Fish and Wildlife Service strongly encourages adherence to guidelines to ensure that bald and golden eagle populations will continue to be sustained.

In most cases *ongoing* existing uses may proceed with the same intensity with little risk of disturbing bald eagles. **However, some *intermittent, occasional, or irregular* uses that pre-date eagle nesting in an area may disturb bald eagles.**
(Ref 26) pg. 564

Regarding off-road vehicle use, the National Eagle Management Guidelines state that from December through August, which is the breeding season through to fledging young, off-road vehicles should not be operated within 330 feet of a nest or within 660 feet of a nest in open areas where there is increased visibility and exposure to noise.

The proposed route should be reviewed for the potential existence of eagle nests and re-routed where necessary. (See map with route overlay pg. 172.)

Note that eagles are known for nesting site fidelity and some territories have been used continually for over 50 years.

In addition, bald eagles will also feed on carcasses along roads. Increasing high impact recreational road traffic in known eagle areas, would increase the risk of eagle mortality feeding along road sides.

National Bald Eagle Management Guidelines, US Fish and Wildlife, May 2007
<https://www.fws.gov/migratorybirds/pdf/management/nationalbaldeaglenmanagementguidelines.pdf> pgs. 4,7, 8,10-13 (Ref 26) pgs. 555-568

5. Rusty Patch Bumble Bee. (See Map with route overlay - pg. 176)

The proposed route passes in close proximity to two locations of rusty patch bumble bees. (See MAP on pg.176.) The Rusty Patch Bumble Bee (*Bombus affinis*) was designated as Minnesota's "State Bee" in 2019.

It is listed as "endangered" under the federal Endangered Species Act and is found in two counties on the proposed route: Itasca and Beltrami.

(Ref 8) pgs.496 & 498. A careful survey, accomplished through the environmental review process, may discover other locations in the project area.

Habitat loss and degradation are two major threats to the Rusty Patch Bumble Bee.

On December 16, 2020, federal lawsuit has been initiated to establish "critical habitat" for the rusty patched bumble bee. (Ref 8B) pg.502 C-D

Minnesota Transportation system acknowledges that it,

"Directly impacts the state's wildlife and habitat resources. As the state experiences global trends like pollinator and species decline, it is important that transportation decision-makers consider ecosystem health. Understanding the challenges and opportunities associated with biodiversity could help protect native plants and animals and the habitat that supports them." (Ref 8A) pg. 502 A

Minnesota is home to several endangered species including the rusty-patch bumble bee. Habitat degradation is one of the leading stressors of a Species in Greatest Conservation need. Pollinators play a unique role in food and flower production.

"Bumble bees and monarch butterflies are examples of two types of pollinators that are essential to Minnesota's environmental health. However, habitat loss and herbicide use have caused both bee and monarch populations to decline."

<https://minnesotago.org/trends/biodiversity> (Ref. 8A) pg.502 A-B

“Critical habitat” has not been established at this time, making it vitally important to protect rusty patched bumble bees at all opportunities. Furthermore, Recovery Plans in U.S. and Canada are in draft form only; they have not been completed.

“Activities that alter soil characteristics, (e.g. removal of woody debris, soil compaction, modification of drainage), may cause habitat loss or permanent or temporary degradation of nesting and overwintering habitat, if the extent of alteration exceeds a critical threshold.

The risk of destruction of critical habitat is increased if the activities are carried out in the critical function zone of a nesting or overwintering site.

“If this activity were to occur within the boundaries of critical habitat at any time of year, it is likely that the effects on critical habitat would be direct and cumulative. The effects of this activity are applicable at all times of the year. **The effects of this type of alteration of nesting habitat would be more severe during the active colony period (March/April to October).**” (Ref. 30 A) pg. 576

Proposed Recovery Strategy for the Rusty-patched Bumble Bee (*Bombus affinis*) in Canada.

As pollinators, **rusty patched bumble bees** contribute to our food security and the healthy functioning of our ecosystems ... **Bumble bees** are among the most **important** pollinators of crops such as blueberries, cranberries, and clover and almost the only insect pollinators of tomatoes. Bumble bees are keystone species in most ecosystems, necessary not only for native wildflower reproduction, but also for creating seeds and fruits that feed wildlife as diverse as songbirds and grizzly bears. Bumble bees are more effective pollinators than honey bees for some crops because of their ability to “buzz pollinate.”

The economic value of pollination services provided by native insects (mostly bees) is estimated at \$3 billion per year in the United States. (Ref 29) pg. 574

<https://www.fws.gov/midwest/es/soc/insects/pdf/RustyPatchedBumbleBeeFactSheetMarch2016.pdf>

6. Northern Long-eared Bat. (Map with route overlay, p. 178.)

The northern long eared bat (*Myotis septentrionalis*) is federally listed as a “threatened” species under the Endangered Species Act. It is found in all 8 counties through which the proposed route would travel. (Ref. 8) pgs. 496-502

"The most crucial months of protection in the Midwest are June 1 through July 31, the lactating period for the bat while roosting in trees and shrubs." (Ref 32) pg. 582. The proposed route would be open during this time frame.

Its conservation status is: "**Critically Imperiled** — At very high risk of extinction or collapse due to very restricted range, very few populations or occurrences, very steep declines, very severe threats, or other factors. (Ref 27 & 28 A) pgs. 570 & 572

The populations of many bat species are declining due to habitat destruction, direct killing, colony disturbance, cave vandalism, use of pesticides, and most recently, white-nose syndrome.

Transportation-related construction projects can impact bat populations, so it is important to develop strategies that limit disruption to bat communities.

In summer, the species is often associated with forested habitats: Fire-Dependent Forests, Mesic Hardwood Forests, and Floodplain Forests, where they make use of tree roosts, especially near water sources. (Ref. 31) pg.578

"The USFWS has not published any mandatory exclusion zones in the Midwest USA, but regulations severely limit project disturbance within 1000 feet of roost trees and known hibernacula." (Ref 32) emphasis added, pg. 582

"Because the bat is a generalist (*meaning they eat whatever they can catch*), protected critical habitats include any tree or shrub 3-inches caliper or larger at breast height when the project is located within the regulated buffer zone. Buffer zones are established within 150 miles of any known hibernacula where the NLEB is present with evidence of the **White Nose Syndrome.**" (Ref 32) emphasis added, pg. 581

7. Endangered and threatened plants in road rights-of-ways.

There are 239 rare plant species in Minnesota that are threatened, endangered or of special concern.

<https://www.minnesotawildflowers.info/page/rare-plants?plID=0>

Off Road Vehicles are made to go off road, and do, likely driving into a ditch or a back slope. Consequently, they have the potential to destroy many state listed plant species without legal consequences under the Minnesota endangered species law due to the exemption stated below.

Minnesota Statute 84.0895, Subd. 2(a)(1) exempts endangered and threatened plants, located within the entire public road right-of-way, from protection under the Minnesota endangered species law – except for “ground not previously disturbed by construction or maintenance.” This includes the traveled portions, banks, ditches, shoulders and medians of any public road, meaning township roads and county roads.

Endangered and threatened plants occur in public road rights-of-way throughout the state. Local populations are vulnerable to extinction if road authorities are not held responsible for determining whether and where rare plants are present prior to maintenance and construction activities that can result in destruction of the populations (activities such as spraying pesticides and soil disturbance).

Road authorities, the Commissioner of Transportation, and the Commissioner of Natural Resources have opportunity to collaborate in determining the status of endangered and threatened plant species in public road rights-of-way and to document those occurrences in the Department of Natural Resource (DNR) Natural Heritage Information System.

The DNR specifically has authority under Minn. Stat. 84.0895 to undertake a census that would help road authorities make informed and efficient planning decisions related to the protection of endangered and threatened plant species. This is science-based decision making an opportunity for governing bodies to work together.

Road authorities must be held accountable for due diligence in following laws related to species that are vulnerable to extinction in Minnesota.

Please note the Minn. Stat. 84.0895 creates an unnecessary exception to the exemption. It states that the roadway exemption does not apply to “... ground not previously disturbed by construction or maintenance ...” A disturbance 100 years ago, when the road was originally constructed, could be included in the exemption. Mowing at any time in the past could qualify the roadway to be included in the exemption. By definition, virtually all existing roads - and right-of-way areas - have been altered sometime in the past, thus allowing the areas to be exempt under the Threatened and Endangered Species Act.

Furthermore, the law fails to establish the standard of evidence and burden of proof necessary to establish that the “... ground was not previously disturbed.”

Finally, the law fails to allow plants to be re-established. In general, plants have the capacity to reestablish in disturbed areas, if conditions are suitable and they are allowed to grow without further disturbance. The proposed bill does not take into account that some endangered and threatened plants can be reestablished in areas “previously disturbed by construction or maintenance.”

The MN DNR is working on a “guidance document”, interpreting this statute. To date, this document has not been made available for public comment. We request a copy of the draft “guidance document”, and the opportunity to review and comment on the draft prior to the time the DNR makes a final decision.

J. Human waste contamination.

Human waste can also pose a serious problem to the environment, even if buried. The most common problem is rain washing contaminants into nearby lakes and streams. The Water Quality Control Board in El Dorado, California ordered the Forest Service and the county to develop plans to prevent the human feces contamination that was entering into and affecting streams and lakes on the Rubicon Trail. (Docs 11 & 12) pgs. 244 & 245-7. (Rubicon Trail Home page: <http://delalbright.com/Rubocon/spills.htm>)

The proposed Border to “Border Touring Route” travels through hundreds of miles with **no available facilities**. Therefore, human waste contamination to waters is a significant concern.

Popular motorized recreational events, such as Jeep Jamboree USA average 100 vehicles and 500 passengers. With no designated facilities on the 764-mile route that would travel hundreds of miles in remote areas, this poses a potentially significant contamination threat to nearby waters. (See pgs. 122-125.)

K. Rules of the road would be, for all practical purposes, unenforceable.

Road safety of the 764-mile proposed route would be impossible to monitor without added substantial funding and resources. The proposed route has no added and dedicated law enforcement oversight, leaving the responsibility to overstretched local agencies that do not have adequate personnel to take on this added duty.

L. No added personnel to execute and monitor needed road closures during a rain event or wet season.

Operational Maintenance Level (OML) 2 roads, under the terms of The Forest Travel Management Plan, should be closed during heavy rain events and wet seasons. There is no added personnel to post signage and monitor these closures.

The U.S. Forest Service (USFS) itself acknowledges they do not have the resources to properly maintain their road system. Therefore, the USFS does not have the resources to take on this added responsibility.

OML 2 roads, which are on the proposed route, are unpaved, single lane, primitive, unmaintained roads with no shoulders and no drainage. The use of these roads, during high levels of precipitation, results in rutting. An increased use of high impact vehicles on these roads, under wet conditions, would increase the severity of rutting. Rutting creates channels of erosion with increased sediment pollution runoff that can enter and degrade water quality and aquatic life in adjacent rivers.

OML 3 roads on the proposed route are unpaved and only receive spot surfacing. These roads would also be vulnerable to significant rutting in a wet season or due to a severe rain event.

M. A potential increase in tourism revenue might not cover a county's full cost of the route. Therefore, taxpayers would be at risk.

There have been no estimates or data provided on the projected economic benefit to counties in the form of increased tourism, user demographics and traffic estimates. Clearwater County opposed the route in part because it did not see any validity to the statement that purports the proposed route would bring increased tourist income to rural counties.

A significant concern is, even if businesses were to realize additional revenue and be taxed on increased revenues, this additional tax revenue going to county coffers would not cover a county's full cost of route maintenance. This remains a concern, even with the 200K funds to be allocated on very stringent conditions, which the Minnesota Association of Townships stated, "was ridiculous." (Doc 14) pg. 253 & (Doc 15) pg. 254

If costs are not covered, taxpayers would be at risk. This is why Clearwater County opposed the route with an official Resolution of Opposition. (Doc. 13, pg. 248.)

N. There are no revenue projections from the proposed route to gauge if the proposed route revenue would off-set the potential loss in the eco-tourism base through user conflicts common with OHV recreation.

https://www.lsohc.leg.mn/materials/16_Mtg/Dec_14_2016_ATV.pdf pgs.20-21
(Doc.13 A) pgs.249-50

O. The \$200,000 is a one-time appropriation for road reimbursement that is insufficient. There is no long-term guaranteed maintenance funding.

Because the proposed route uses public roads, and OHV funds are prohibited from being used on public roads, all funds must be voted on by the Legislature. There is no long term guaranteed maintenance funding. This one-time appropriation of \$200,000.00 will expire in June 2023. (Doc 15, pg. 254-5.)

P. The USFS statement that it lacks the funds to properly maintain roads for public safety puts the public at risk.

It also puts the environment at risk, by increasing high impact traffic on unpaved roads, some of which are now completely unmaintained and others which receive minimal maintenance due to lack of funds.

The Superior National Forest's statement in its 2015 Forest-Wide Road Study Report, that road maintenance funds have been cut by 60% since 2000 and that it lacks the funds to properly maintain roads for public safety, puts the general public at risk. The risk factors to the public and the environment have the potential to be significantly heightened due to the increased high impact traffic of the proposed nationally advertised OHV route. (Doc 89) pg. 408

Q. There is no projection model of the cumulative long-term effects of the environmental impact of the proposed route to waters, invasive species spread and biodiversity, or the cumulative long term potential impacts to aquatic and wildlife habitat and the associated adverse effects on species themselves.

R. Noise Pollution.

Existing roads would be used for the proposed route. Many of these roads in the northeast and in the Superior National Forest have historically low traffic volume in low density population areas. An increase in high impact traffic density would be generated due to the national promotion of the route on the DNR website, on social media and off roading websites around the nation. This would include the popular off roading caravan events such as Jeep USA which averages 100 vehicles, 500 passengers per event. (Pgs.122-125.)

More traffic means more noise that would also be emitted more frequently than other high-intensity sounds - and the effect on animals can be significant. (Ref 2) pg. 482

Noise emitted from certain types of OHVs can be as high as 110 decibels, which is near the threshold of human pain. (Ref 34) pgs. 584-5

<https://www.uofmhealth.org/health-library/tf4173>

The zone of impact created by noise from OHV traffic carries far beyond the road way. Direct ecological effects extend over an area 10 times greater than the road width. (Doc 49) road zone effect, pgs. 319-321

http://www.lauxen.net/conecte/referencias/Forman_1997a.pdf

In addition, because the route would come within 1.25 miles of the BWCAW, noise from an increase in the frequency of high impact vehicles from the nationally advertised route, including the popular caravan events like Jeep Jamboree USA that averages 100 vehicles with 500 people per event, could generate noise heard within BWCAW. Also, The Prospector ATV Loop, which partially opened in June 2020, uses some of the same roads as would the proposed Border to Border route, which would compound and heighten the added noise generated on these roads in close proximity to the BWCAW.

The Forest-Wide Travel Management Environmental Assessment of 2008 did acknowledge under "Future Impacts" that some increase in future ATV/OHV could occur in the proximity of the BWCAW, but that infrequent and low amounts of traffic could add minor amounts of additional noise.

The proposed B2B, as a designated route, nationally advertised on websites, in social media and off roading clubs around the nation, risks generating very frequent and significant amounts of traffic. The initial B2B DNR project manager, Mary Straka, gave an estimate of 2,000 vehicles per season *to start with*, to the Clearwater Lake Area Association President. (Doc. 7) pg. 233

From the Forest-Wide Management Study Environmental Assessment 2008:

"Some increase in use of ATVs and OHVs may occur in the future in proximity to the BWCAW. Infrequent and low amounts of traffic from resource management projects near the BWCAW could add minor amounts of additional noise. "

https://www.fs.usda.gov/nfs/11558/www/nepa/38755_FSPLT1_024880.pdf (pg. 3-33 of pdf.)

S. Connected and phased action must be considered.

Minnesota Rule 4410.1000, subpart 4 states in part:

"Multiple projects and multiple stages of a single project that are connected actions or phased actions must be considered in total when determining the need for an EAW, preparing the EAW, and determining the need for an EIS."

Minnesota Rule 4410.0200, Subpart 60, defines "phased action":

"Subp. 60. **Phased action.** "Phased action" means two or more projects to be undertaken by the same proposer that a RGU determines:

- A.will have environmental effects on the same geographic area; and
- B.are substantially certain to be undertaken sequentially over a limited period of time."

Minnesota Rule 4410.022, Subpart 9c, defines "connected action"

"Subp. 9c. **Connected actions.** Two projects are "connected actions" if a responsible governmental unit determines they are related in any of the following ways:

- A.one project would directly induce the other;
- B.one project is a prerequisite for the other and the prerequisite project is not justified by itself; or
- C. neither project is justified by itself."

Consequently, **the following "connected" and "phased" actions** of the proposed route - stated by both the Minnesota Four Wheel Drive Association (MN4WDA) President, Rick Langess, and the proposed Border to Border Touring Route finder, Ron Potter of the National Off Highway Vehicle Conservation Council (NOHVCC) - should be considered in reviewing and determining the need for an EAW:

1. Rick Langess (MN4WDA) President stated in the 2/21/20 edition of the Minnesota Cook County News Herald:

"This route is just phase one of a two phase project. The goal is to work with local governments who will bring us ideas on where to build loops that will attract wheelers to their area." (Doc. 3) pg. 220

Langess further stated in the same print interview, **"The B2B is one project of 20 that are currently in our queue."**

The MN4WDA also **testified at the Minnesota Legislature** on March 28th 2019, stating that **this is one project they have in a queue of multiple ones** and that **this proposed project would get the ball rolling on some of these other projects.** The recorded testimony begins at 1:37:34.

<http://ww2.house.leg.state.mn.us/audio/mp3ls91/envfin032819.mp3>

2. Ron Potter (NOHVCC), who was the route finder hired by the MN DNR for the project, stated in an 8/2017 article for MPR news that, "A phase two plan to build several challenge loops off the trail to attract serious road aficionados won't happen for several years." (Doc. 1A) PG. 215

On page 6 of the NOHVCC June 2018 report to the MnDNR Parks and Trails Division, under "Product Deliverables", it states there will be two routes, one East to West and one South to North that the team will approach as one full route with 2 sections of branches of the route." (Doc 2) pg. 217

T. Cumulative Environmental Impacts of Multiple Off Road touring routes and trails.

The cumulative environmental impacts of the proposed B2B should be studied, in conjunction with the following projects that are in various planning stages as well, to determine the cumulative overall environmental impact to the State's aquatic and wildlife and natural resources, including the potential for increased habitat fragmentation, soil erosion, biodiversity and water degradation, invasive species spread, and a significant increase in greenhouse gas emissions contributing to climate change.

1. The ATV Prospector Loop, 130 miles of which opened in June 2020.

The goal of the Prospector Loop system is to provide 1500 miles of connected trails. This will follow some of the same roads as the proposed B2B near the BWCAW and cross 9 of the same streams, 3 of which are Prohibited waters. (Doc. 5B) pgs. 230 A-D & (Doc 5C) MAP pg. 230 E

2. DNR Statewide System of touring routes and trails for Off-Road Vehicles in the planning process with funds granted in 2019. This State ORV master plan is for 4 X 4 vehicles capable of off road travel and includes modified pickup trucks, sports utility vehicles and "rock crawlers" as noted in the announcement literature. (Doc. 5D) pgs.230 F-I

3. DNR off-highway motorcycle use masterplan across the state in the planning stages. (Doc. 5E) pgs. 230 J-K

U. The close proximity of the proposed Border to Border Route to the BWCAW requires a federal Environmental Assessment, under the National Environmental Policy Act "NEPA", of environmental impacts and user conflicts to this wilderness area before any final alignment would be implemented.

In the 2004 Revised Forest Travel Management plan, the decisions in the revised Forest Plan were made because ATVs, off-highway motorcycles and four-wheel drive vehicles are a legitimate use of national forests, and there is a need to provide opportunities for this very popular and growing recreational pursuit.

However, there is also a need to protect natural and ecological resources, provide opportunities for non-motorized recreational uses, and to reduce conflict among users. (Forest Plan Record of Decision, p. 15).

https://www.fs.usda.gov/nfs/11558/www/nepa/38755_FSPLT1_024875.pdf
(pdf pgs. 1-3)

V. Management and enforcement issues of going off the trail.

The lack of planning and funding for added and dedicated enforcement oversight FTE has direct implications for negative environmental impacts along the route. Going off trail is well documented by both rangers and OHV users themselves, with negative impacts to waters, aquatic and wildlife and to the overall ecosystem.

There will be no added and dedicated law enforcement oversight for the proposed 764-mile route. County sheriffs do not have the added staff or capacity to take on the additional oversight of the 764-mile designated route. The project proposal states:

“The DNR Division of Enforcement plans to provide additional conservation officer time along the route during the first year of operation and as needed after that.” (Doc.15A) pg. 257

Given the documented evidence from both user and rangers testimony, ongoing oversight for the entire route is a requisite for citizen and user safety and to limit environmental damage.

We maintain this is insufficient planning that puts citizens and the environment at risk given the well-established, documented history of this aspect of the recreational sport and its negative environmental impacts.

In a marketing study done for the Colorado Coalition for Responsible OHV Riding, nearly 2/3s of the adults acknowledged they knowingly go off road occasionally. The report concluded: “In a “nutshell,” it is our premise that further information and education per se - will not result in substantial behavioral change.”

According to a 9/29/20 Star Tribune article:

Minnesota has been expanding its off road trail networks to accommodate legions of new riders, with 329,275 registrations of off-highway vehicles.

“They are going wherever they want,” said DNR conservation officer Amber Ladd. “I’ve never had this many issues or complaints.”

(Doc 15 C) pgs.261 A-C

Given the documented testimony from users themselves - admitting they go off trail in surveys - and rangers agreeing across the board in one study that OHV users going off trail is a significant issue that in some cases is out of control, **enforcement personnel should be added** to specifically monitor the proposed route. Furthermore, the B2B Touring Route **must be re-routed** to avoid sensitive natural resources and high biodiversity and conservation protection designated areas.

From the Motorized Travel Management Final EIS 2/2010, Shasta Trinity National Forest - Volume 2, Appendix A – M. (See Doc. 15B) pgs. 258-261
Source: https://www.fs.usda.gov/nfs/11558/www/nepa/46912_FSPLT1_026053.pdf

“In a closely tracking review on federal land managers, in December 2007, the Public Employees for Environmental Responsibility (“PEER”) released the first- ever survey of federal rangers’ views on off-road vehicle issues. “Rangers for Responsible Recreation: Off-Road Vehicle Issues Survey of SW Law Enforcement Professionals - Bureau of Land Management (BLM) & Forest Service (FS), 2007.

“Strikingly: 91% of respondent rangers agree that **“off-road vehicles present a significant law enforcement problem in my jurisdiction”**; “More than half (53%) feel “off-road vehicle problems in my jurisdiction are **out of control**”; and “74% say that off-road abuses “are worse than they were five years ago” while fewer than one in six (15.2%) believe the situation is improving.

Moreover, the survey found that rangers believe their agencies are unequal to the task of controlling ORV abuse: “62% believe **their agency is not “prepared to deal with the ORV problems** we are experiencing”; and “78% do not think their department “devotes adequate resources to cope with ORV problems.”

https://permanent.access.gpo.gov/gpo12131/Vol.2/46912_FSPLT1_026053.pdf

(Doc. 15B) pg. 261

“Monaghan and Associates, a marketing research firm, conducted a 2001 study at the behest of the Colorado Coalition for Responsible OHV Riding, a coalition of off-road vehicle representatives, environmentalists and public officials. See Status and Summary Report; OHV Responsible Riding Campaign, attached hereto. Researchers surveyed Colorado off-road vehicle riders through a series of three focus groups. Monaghan and Associates found that the majority of off-roaders understand that staying on designated routes is “fundamental trail etiquette” and that going off trail is not “correct” off-road vehicle behavior. Id. at 11.

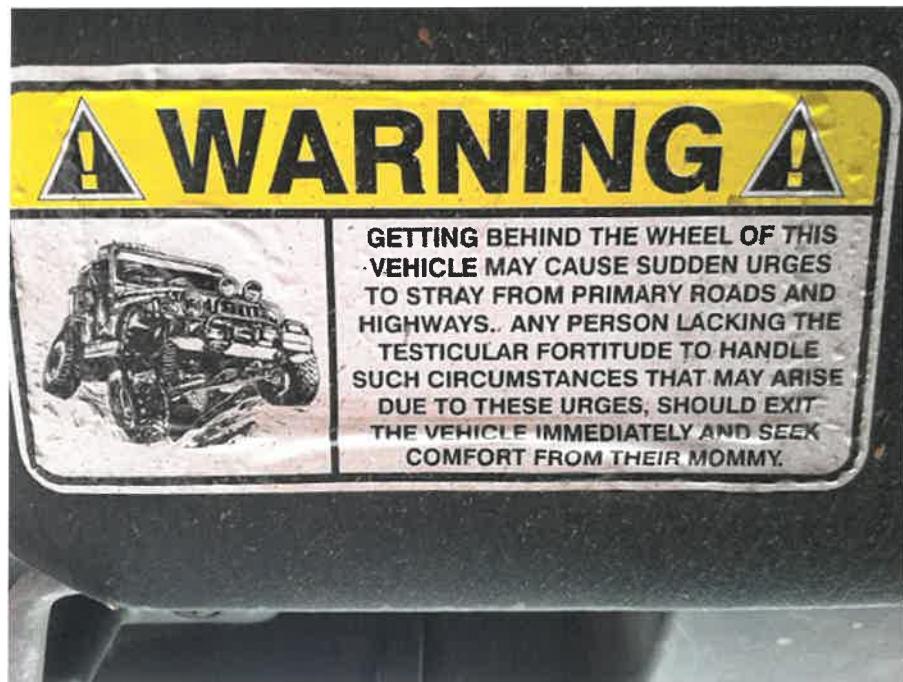
The survey revealed, however, that regardless of this knowledge **“as many as two-thirds of adult users go off the trail occasionally.”** Id. A significant percentage of riders, 15- 20%, admitted to frequently breaking the rules and riding off of legal routes often. Id. Survey participants also stated that “others” ride off-route and cause most of the damage. Id. at 7. “Many reluctantly admit to having gone off trail “a couple times” but felt that it is permissible if rarely done “just this one time. “Id.

Tellingly, the report concluded: “In a “nutshell,” it is our premise that further information and education per se - will not result in substantial behavioral change. Id. at 1.” [\[Motorized Travel Management ... page 185\]](#)

https://permanent.access.gpo.gov/gpo12131/Vol.2/46912_FSPLT1_026053.pdf

(Doc. 15B) pg. 259

This bumper sticker is from a local OHV website in Cook County, MN.



Also, of note is that the original DNR Border to Border Touring page to announce the proposed route and generate interest in the OHV Community, was the photo below:

Border to Border Touring Route - Minnesota DNR

<https://www.dnr.state.mn.us/input/mgmtplans/touring/index.html>

Page Menu

Border to Border Touring Route



Family touring together in a highway licensed vehicle.

COMING IN 2019:

Border-to-Border Touring Route

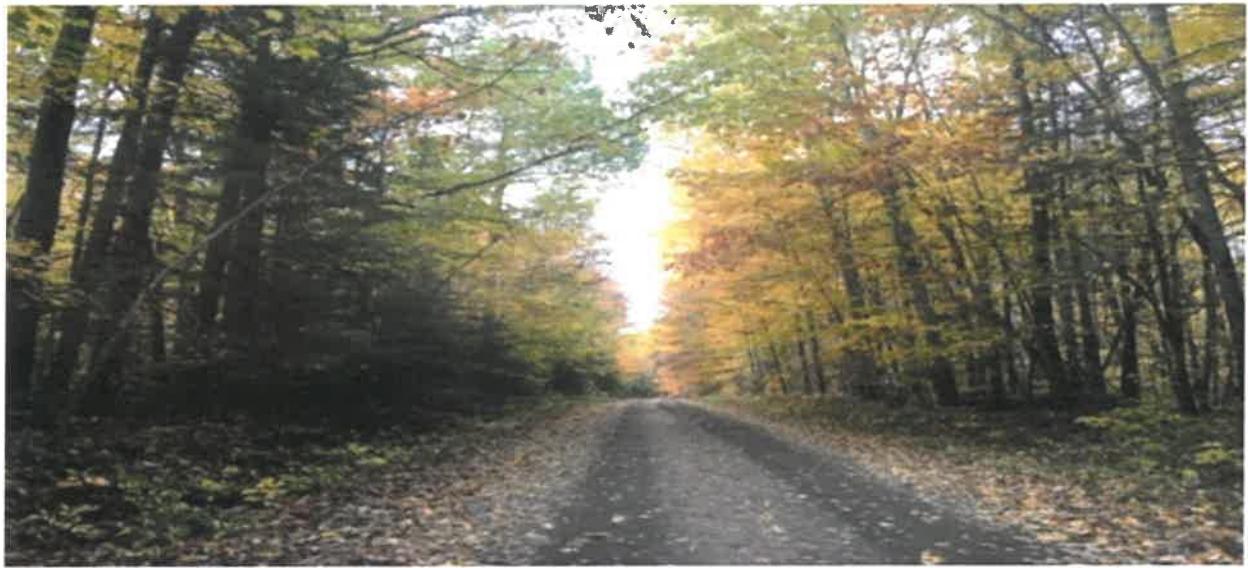
New "adventure trail" will connect dirt, gravel and other rugged backroads across Northern Minnesota

One year into the process of public meetings, after the DNR and NOHVCC staff had encountered opposition from several Counties, the Minnesota Association of Townships, the Grand Portage Reservation and residents regarding environmental and maintenance concerns, the route promotion photo was changed to the photo below.

Notably, there is now no vehicle pictured, only a flat, wide backroad. The website text, and intent of the route, however, remains the same despite the image change: "New Adventure Route will connect rugged backroads of Minnesota."

The fact that the photo was so significantly changed after a year, signals there is concern about how the route will be used.

Border to Border Touring Route



Fall landscape along a road.

Border-to-Border Touring Route

New "adventure route" will connect rugged backroads across Northern Minnesota

W. TYPES OF ORV EXPERIENCES

This is a list of ORV experiences complied for the virtual summit meeting to create an Off Road Vehicle Statewide Strategic Master Plan. It was hosted on line by the consultant SE Group, the Mn DNR and the Mn4WDA on 11/18/20. Mn4WDA and the DNR are also the co-proposers of the proposed Border to Border Route.

Given the documented testimony in item “T” from both OHV drivers and Rangers that a significant number of users go off the designated trail route, it is logical to assume that some of these listed activities could also occur on the proposed Border to Border route.

Without sufficient enforcement personnel presence monitoring the route 7 days/ week during the open season, some of these ORV activities risk having significant environmental impacts.

This is a photo of the slide shown during the virtual summit meeting on 11/18/20.

Types of ORV Experiences

- Touring
- Overlanding
- Soft roading or light wheeling
- Rock crawling
- Rock bouncing
- Rock racing
- Mudding



ORV touring: Off-roading is the activity of driving or riding a vehicle on unsurfaced roads or tracks, made of materials such as sand, gravel, riverbeds, mud, snow, rocks, and other natural terrain.

Overlanding:

The proper overlanding vehicle must be equipped to traverse an almost infinite combination of terrain and weather. To compound the complexity, the vehicle must be able to transport water, food, shelter, tools, and other essential sundries.

Make no mistake: overlanding is hard work, and you're often faced with extreme temperatures and all-manner of Mother Nature's curious critters.

But, for overlanding enthusiasts, that's the entire point.

U-joints shear, **tires rupture**, and paint gets scratched—you're the one that has to deal with it.

You can go days without a shower, and your evening meals might consist of black coffee and whatever you could fish out of the nearest river.

<https://www.onallcylinders.com/2018/07/12/overlanding-101-what-it-is-and-how-to-get-started/>

Soft Roading: It's where you take your burly truck, SUV, or any four-wheel-drive and traverse across dirt trails, riverbeds, mud, snow, and other natural terrain. ... Similar in concept to off-roading, the act of soft-roading is usually carried out with any number of all-wheel drive vehicles (sometimes referred to as light off-roading).

["everything you need to know about soft roading"- google search](#)

Rock Crawling:

en.wikipedia.org › wiki › Rock crawling

Rock crawling is an extreme form of off road driving using vehicles anywhere from stock to highly modified to overcome obstacles. In **rock crawling**, drivers drive highly modified four-wheel-drive vehicles such as trucks, Jeeps, and "buggies" over very harsh terrain.

Rock Bouncing: Steep hill climbs are the bouncers' Mount Everest. Failed attempts are often dramatic: yard-sale rolls down the hill. But have no fear, these machines are built to be quickly righted and run again.

<https://www.offroadxtreme.com/event-coverage/racing/gorilla-run-where-the-sport-of-southern-rock-bouncing-began/>

Rock Racing: The competitive form of rock crawling.

They (people) see rock crawling as slow, enjoyable, relaxing. They also recognize it's a challenge. This is recreational rock crawling. It can be a pretty tame trip down an easy trail with a few rocks to negotiate or a hardcore excursion with ample body damage and winching. Recreational rock crawling led to the creation of competitive rock crawling.

http://www.axialracing.com/blog_posts/1073910843

Mudding: also known as mud bogging, mud slinging or mud racing, is a type of off-roading that centers on getting dirty. In its simplest form, **mudding** just means driving through its slimy, grimy namesake.

mudding to go out in the mud in the back of a truck or jeep or other 4x4 vehicle and spin in the mud until all the occupants are covered in mud.

<https://www.urbandictionary.com/define.php?term=muddi>

X. The Petitioners incorporate by reference – as “material evidence” supporting their Petition for an Environmental Assessment Worksheet – the attachments, designated “Supporting and Material Evidence” in pages 39- 589.

Legal Framework

A. Minnesota Environmental Policy Act or “MEPA” (Minnesota Statute, Chapter 116D; Minn. Rule Chapter 4410; and relevant case law) govern environmental review of DNR projects, unless there is a “federal action”, in which case the National Environmental Policy Act or “NEPA” will also apply.

“No state action significantly affecting the quality of the environment shall be allowed, nor shall any permit . . . be granted . . . [that] is likely to cause pollution, impairment, or destruction of the air, water, land or other natural resources . . . so long as there is a feasible and prudent alternative. Economic considerations alone shall not justify such conduct.” (Minn. Stat. 116D.04, Subd. 6)

In considering whether or not a Responsible Government Unit (RGU) must order an Environmental Assessment Worksheet (EAW), Minnesota Rule 4410.1100, Subpart 6, states,

The RGU shall order the preparation of an EAW if the evidence presented by the petitioners, proposers, and other persons or otherwise known to the RGU demonstrates that, because of the nature or location of the proposed project, the project may have the potential for significant environmental effects . . . In considering the evidence, the RGU must take into account the factors listed in part 4410.1700, subpart 7.”

Minnesota Rule 4410.1700, Subpart 7 states:

"Subp. 7. Criteria. In deciding whether a project has the potential for significant environmental effects, the following factors shall be **considered**:

"A. type, extent, and reversibility of environmental effects;

"B. cumulative potential effects. The RGU shall consider the following factors: whether the cumulative potential effect is significant; whether the contribution from the project is significant when viewed in connection with other contributions to the cumulative potential effect; the degree to which the project complies with approved mitigation measures specifically designed to address the cumulative potential effect; and the efforts of the proposer to minimize the contributions from the project;

"C. the extent to which the environmental effects are subject to mitigation by ongoing public regulatory authority. The RGU may rely only on mitigation measures that are specific and that can be reasonably expected to effectively mitigate the identified environmental impacts of the project; and

"D. the extent to which environmental effects can be anticipated and controlled as a result of other available environmental studies undertaken by public agencies or the project proposer, including other EISs."

In summary, based on the all of the evidence in this Petition – and otherwise known to the DNR, the potentially significant environmental effects from the proposed "Border to Border Touring Route" will very likely be:

A. virtually irreversible damage to water quality, endangered and sensitive plants and animals, and other natural resources;

B. continuous, increasing, and cumulative impacts over time – as the high impact motor vehicle traffic increases, as planned;

C. environmental impacts that cannot be practically mitigated, due to:

1. the inherent nature of irresponsible drivers;
2. lack of mitigation funds for buffering, soil erosion control, consistent maintenance, restoration, long term invasive species monitoring and control management across the entire route (due to Minnesota budget shortfalls, estimated to be in the billions);
3. lack of adequate funding for dedicated long-term law enforcement over the 764-mile route;
4. the continuing – and increasing – nature of the impacts;
5. the irreversible nature of the damage, as stated above.

D. environmental effects that cannot be controlled as a result other environmental studies.

Therefore, the information contained in this EAW Petition – and otherwise known to the RGU - satisfies the legal criteria for which an **EAW must be ordered**.

B. Federal Law.

An Environmental Assessment – under the National Environmental Policy

Act (“NEPA”) is also needed order to determine if impacts on Federal Lands from the proposed Route are in compliance with Minimization Criteria For Off-Road Vehicle Use under Presidential Executive Orders 11,644 and 11, 989. (See “Supporting and Material Evidence”, pgs. 204-206)

<https://repository.law.umich.edu/cgi/viewcontent.cgi?article=1047&context=mjeal>

Conclusion

This petitioning group has submitted material evidence in this Petition demonstrating that the proposed “Border to Border Touring Route” project, along with the phased and connected actions, have the potential to significantly impact some of Minnesota’s most fragile aquatic and terrestrial areas. All of the legal requirements have been satisfied.

Therefore, we respectfully Petition you to order an Environmental Assessment Worksheet (EAW) for the Border to Border Touring Route, along with the other stated phased and connected actions.

Thank you.

105 Petitioner Signatures are attached in the link below.

<https://documentcloud.adobe.com/link/track?uri=urn:aaid:scds:US:5503afae-256f-48f9-8d70-d6d910fe37e2>

SUPPORTING TEXT AND MATERIAL EVIDENCE :

WATER ISSUES

A watershed-based focus that recognizes the connection between landscapes, riverscapes and the condition of aquatic resources will be essential to protection and restoration efforts.

<https://www.pca.state.mn.us/sites/default/files/wq-ws3-04010101b.pdf>

pg. 272

(Doc 20)

The Lake Superior – North Watershed and the Rainy River Watershed are noted for exceptional water quality.

RAINY RIVER HEADWATERS WATERSHED

The Minnesota Pollution Control Agency stated that the majority of the waterbodies within the Rainy River watershed have exceptional biological, chemical and physical characteristic that are worthy of additional protection. The substantially undeveloped watershed is undoubtedly a key reason for the high water quality found in the majority of the Rainy River-Headwaters Watershed.

<https://www.pca.state.mn.us/sites/default/files/wq-ws3-09030001b.pdf> (Doc 21 & 22)

pgs. 273-4

Overall lakes and streams within the Rainy River- Headwaters Watershed have benefited from little development pressure. However, these systems are highly sensitive to anthropogenic stressors like most waterbodies in Northern Minnesota. A continued vigilance is necessary to monitor areas where developmental pressures will or are expected to occur. Point and non-point pollutants are affecting water quality.

<https://www.pca.state.mn.us/sites/default/files/wq-ws3-09030001b.pdf> (Doc 23)

pg. 275

5 out of the top 10 ranked streams noted for exceptional biological, chemical and physical parameters that the MPCA states are worthy of additional protections to preserve their aquatic resources, would be crossed by the proposed route on unpaved roads.

<https://www.pca.state.mn.us/sites/default/files/wq-ws3-09030001b.pdf> (Doc 23) pg. 275

Some streams in the Rainy River Watershed are of such high quality they carry the same MPCA ranking of “ Prohibited Protection “ status as the BWCAW does.

3 of these streams would be crossed by the proposed route on unpaved roads.

LAKE SUPERIOR-NORTH WATERSHED

The Minnesota Pollution Control Agency stated that the Lake Superior-North Watershed streams, lakes and wetlands rank among the highest quality in the state and some represent near reference quality examples at a national scale.

<https://www.pca.state.mn.us/sites/default/files/wq-ws3-04010101b.pdf> (Doc 20)

pg. 272

The MPCA noted that, the watershed is unique as it contains many exceptional water resources, few impairments and significantly, a relatively low population density. During the development of WRAPS action and strategy priorities included : Sustaining Minnesota’s Lake Superior Tributaries in a Changing Climate.

<https://www.pca.state.mn.us/sites/default/files/wq-ws4-51a.pdf> (Doc 24) pg. 276

For much of the watershed the population density recorded in the most recent US census is less than 1 person per square mile, which also accounts for historically low traffic use of the roads on the proposed route and the ability to sustain pristine waters crossed by these routes.

<https://www.pca.state.mn.us/sites/default/files/wq-ws4-51a.pdf> (Doc 25) pg. 277

Essentially all of LSN’s exceptional streams drain minimally developed, lightly disturbed catchment.

<https://www.pca.state.mn.us/sites/default/files/wq-ws3-04010101b.pdf> (Doc 26)

pg. 278

All of the watershed's streams and rivers drain to Lake Superior although there is no single pour point.

<https://www.pca.state.mn.us/sites/default/files/wq-ws3-04010101b.pdf> (Doc 27) pg. 279

Water quality protection in the LSN is of the highest importance, as stated by the MPCA. Stream biological monitoring suggest sensitive indicator taxa are widespread and abundant and several rare species of fish and macroinvertebrates were observed. Many streams were designated as exceptional aquatic resources, which should provide a higher level of protection from degradation.

<https://www.pca.state.mn.us/sites/default/files/wq-ws3-04010101b.pdf> (Doc 28) pg. 280

The Minnesota Pollution Agency stated in its 2018 report that protection efforts and strategies in the Lake Superior North Watershed are a priority and of the highest importance.

<https://www.pca.state.mn.us/sites/default/files/wq-ws4-51a.pdf> (Doc 29) pg. 281

Of the streams monitored by the MPCA in the LSN in its 2017 report, 40% of the streams meet the criteria for the highest exceptional ranking.

These streams typically contain Brook Trout and other fishes that require clean, cold water, including species that are rarely found outside of Lake Superior- North Watershed (e.g. Longnose Sucker). Lake Chub, a state-listed species of Special Concern, was found in several streams in the far northeast corner of the watershed.

The macroinvertebrate communities of these exceptional streams are typically diverse, include high densities of sensitive insects and are particularly rich in stonefly and caddisfly genera.

The larval dragonfly Boyeria grafiana, a state listed Species of Special Concern, was found in 22 streams and several other rare macroinvertebrates were observed in various streams across the watershed.

<https://www.pca.state.mn.us/sites/default/files/wq-ws3-04010101b.pdf> (Doc 30) pg. 282

TALU FRAMEWORK for Water Quality – Exceptional Use MPCA ranked streams

The Tiered Aquatic Life Uses scoring system and framework was adopted in June 2018. It provides a mechanism to identify and protect high quality water resources. The Talu framework provides accuracy and a higher tier use to protect high quality waters.

Once a water body has been established as meeting the requirements of a high quality water resource, such as the exceptional streams in the Lake Superior-North and Rainy River-Headwaters watershed, the resource must be protected to maintain that status.

All of the streams identified by the MPCA with a TALU designation of exceptional use in the Lake Superior – North Watershed and the Rainy River-Headwaters watershed should remain at that exceptional use level.

<https://www.pca.state.mn.us/sites/default/files/wq-ws4-51a.pdf>

(Doc 31) pg. 283

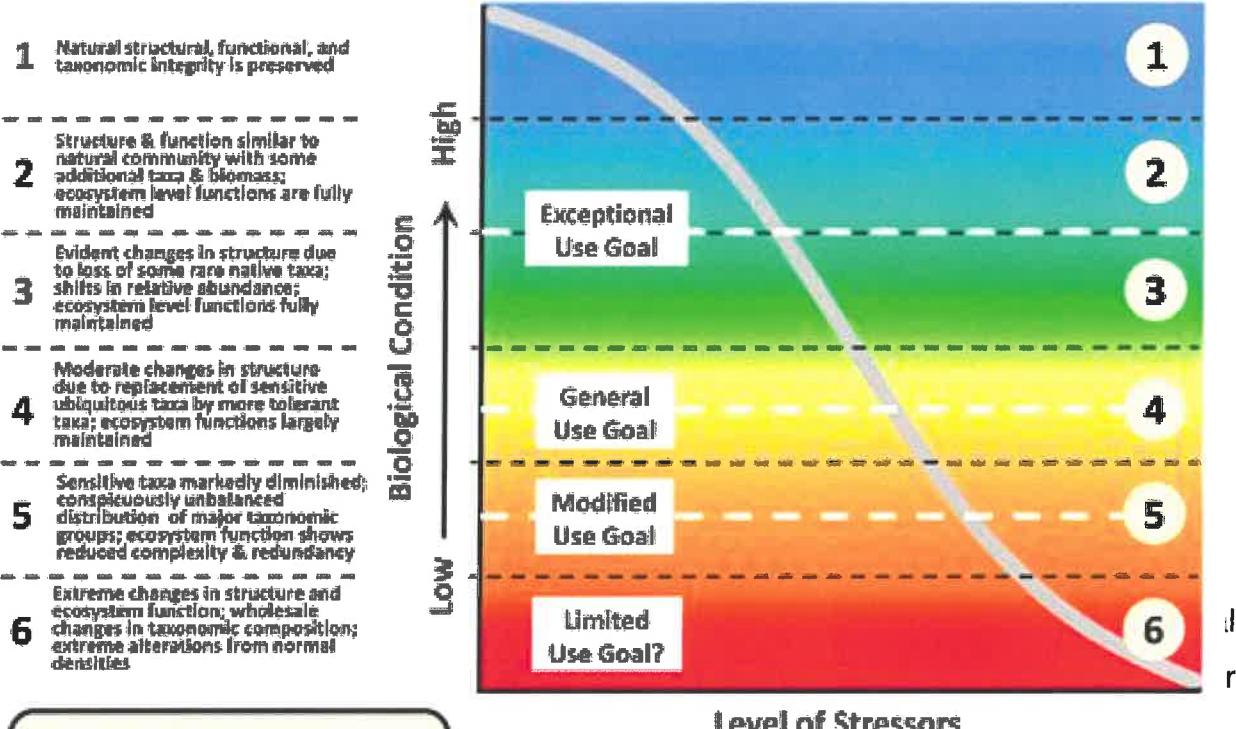
Tiered Aquatic Life Uses (Talu) Framework

Minnesota has adopted changes to its water quality standards (Minn. Rule Chapters 7050 and 7052) that establish a tiered aquatic life uses (TALU) framework for rivers and streams. These rule amendments affect Class 2 (Aquatic Life) standards. The EPA approved the TALU framework rule on June 26, 2018.

The adopted TALU framework is a significant revision to the aquatic life use classification in the state's water quality standards. It built upon existing water quality standards to improve how water quality in streams and rivers are monitored and managed. Additionally, these changes advance the ability to identify stressors and develop effective mechanisms to improve and maintain the condition of waters in Minnesota.

The adopted TALU framework enhances the protection and maintenance of the biological, chemical and physical integrity of state water resources by achieving the following goals:

- Establishes biological water quality standards. This provides a more direct method to measure and protect biological health and identify water quality problems that chemical measurements alone might miss.
- **Protects high-quality water resources. The framework provides a mechanism to identify and protect high quality water resources.**
- Provides a mechanism to appropriately and reasonably classify and assess modified water resources. These include channelized streams and ditches.
- Improves stressor identification. This provides greater accuracy when assessing the stressors that impact Minnesota's water resources.



The Biological Condition Gradient

measure of the biological community. This can be problematic due to the large number and diversity of the stressors that impact biological communities which include chemicals, reduced oxygen, sedimentation, increased temperature, and habitat degradation .

- As a result, the monitoring of chemical and physical parameters for all potential stressors can become too cumbersome to be practical. Rather than measuring the wide variety of stressors, biological communities can be monitored as they are a direct measure of the response of the biota to a wide range of physical and chemical stressors. In other words, their condition is a reflection of all the impacts of multiple stressors over time. Chemical standards have been, and will remain, an important tool for restoring and protecting beneficial uses.

However, the addition of biological monitoring and biological standards will complement them and will result in refinement of chemical criteria.

- High quality water resources. Another limitation of Minnesota's current water quality framework is that high quality resources are often under protected. At present there is a framework to protect the degradation of high quality waters called antidegradation, but there are still elements of Minnesota's antidegradation provisions in rule that can allow considerable degradation of these waters without violating the CWA (Clean Water Act).
- **TALU establishes a higher tier of use to protect these high quality waters.** Once a water body has been established as meeting the requirements of a high quality water resource, the resource needs to be protected to maintain that status. The concept of protecting the “existing” use of a waterbody is one of the most important tenets of the CWA.

<https://www.pca.state.mn.us/water/tiered-aquatic-life-uses-talu-framework> (Doc 32)
pgs. 284-5

Federal antidegradation regulations require states to adopt antidegradation policy and identify implementation procedures that maintain and protect existing uses, prevent unnecessary degradation of existing high water quality and maintain and protect the quality of waters identified for their outstanding value.

The MPCA has completed rulemaking to replace the existing nondegradation rules found in Minn. R. ch. 7050 with new antidegradation rules. The new rules became effective on November 21, 2016

The Rules Relating to the Antidegradation of State Waters, 7050.0250 Antidegradation Purpose state:

- A. Existing uses and the level of water quality necessary to protect existing uses shall be maintained and protected.
- C. Water quality necessary to preserve exceptional characteristics of outstanding resource value waters will be maintained and protected.

(Doc 33) pg. 286

CONCLUSION

In summary, the B2B project proposer has not provided evidence that the new and cumulative impacts of this route, its phases and related future routes and challenge loops, would be mitigated or managed in such a way as to maintain watershed quality in its current state.

STREAM CROSSINGS

In the Lake Superior-North and Rainy River Watersheds, the proposed Border to Border Route for Off Road Vehicles that would cross:

31 streams, 63 times

3 Prohibited Protection MPCA ranked streams, 8 times

9 Exceptional Use MPCA ranked, 24 times

27 Designated Trout streams , 61 times

Road-stream crossings have effects on stream invertebrates. Hawkins and others (in press) found that the aquatic invertebrate species assemblages (observed versus expected, based on reference sites) were related to the number of stream crossings above a site.

Total taxa richness of aquatic insect larvae (mayflies, Ephemeroptera; stoneflies, Plecoptera; and caddisflies, Trichoptera) were negatively related to the number of stream crossings. Another study (Newbold and others 1980) found significant differences between macroinvertebrate assemblages above and below road- stream crossings.

Roads contribute more sediment to streams than does any other land management activity .(Gibbons and Salo 1973, Meehan 1991)

Serious degradation of fish habitat can result from poorly planned, designed, located, built, or maintained roads (Furniss and others 1991, MacDonald and others 1991, Rhodes and others 1994).

Roads directly affect natural sediment and hydrologic regimes by altering streamflow, sediment loading, sediment transport and deposition, channel morphology, channel stability, substrate composition, stream temperatures, water quality, and riparian conditions in a watershed.

<https://www.fs.fed.us/pnw/pubs/gtr509.pdf> (Doc 34) pgs. 287-8

As noted by the MPCA, road stream intersections can present acute threats to water quality aquatic health in the Lake Superior-North Watershed.

<https://www.pca.state.mn.us/sites/default/files/wq-ws3-04010101b.pdf>
(Doc 35) pg. 289

The MPCA notes that associated development of roads and culverts may contribute to the degradation of water quality and aquatic habitat via increased sedimentation. They also note that further management strategies may be needed to protect some high quality and sensitive aquatic resources.

“ The Lake Superior- North Watershed’s extensive network of paved and gravel roads intersects rivers and streams in more than 300 locations. Road crossings may directly contribute sediment, contaminants and warm water to streams as precipitation flows across and off road surfaces. Improperly sized or positioned culverts may affect hydrology and stream geomorphology, causing scouring and aggradation which negatively affect in-stream habitat.

Stream crossings may also inhibit ecological connectivity within stream networks, in the form of reduced movement of water, energy, material, and organisms. (Forman and Alexander 1998, Freeman et al. 2007). Several streams in the Lake Superior-North Watershed have crossings that may be potential impediments to connectivity and or could be causing habitat degradation. Potentially problematic crossings were observed at Assinika Creek, Fredenberg Creek, Hocakamin Creek, Woods Creek, Wanless Creek, Manitou River (on the proposed route) and Spruce Creek."

"Other road crossings in need of repair or redesign surely exist within the watershed."

"Identifying and prioritizing the rehabilitation of problematic road-stream intersections should be an important component of protection strategies for the Lake Superior-North Watershed."

<https://www.pca.state.mn.us/sites/default/files/wq-ws3-04010101b.pdf>

(Doc 36) pg.290

Road-stream crossings also have the potential to impact channel stability resulting in increased sediment supply from within the stream.

To address road impacts on local stream stability, channel segments, at seven sites, both upstream and downstream of road crossings, were evaluated for stability in the LSN watershed. At three of the seven sites, the stream segment downstream of the road crossing was found to have an overall reduced stability compared to the upstream segment of stream.

Field observations also identified increased runoff pathways from roads to streams at the culvert locations. At these locations increased sediment deposition was apparent on riprap and channel boulders.

<https://www.pca.state.mn.us/sites/default/files/wq-b2-04.pdf>

(Doc 37) pg. 300

"Roads were found to increase the drainage density of channel networks and efficiently convey overland flows to streams. These overland flows have the potential to carry high sediment loads to streams.

During field investigations, culverts and bridges at stream-road crossing were determined to impact stream instability and bank erosion both downstream and upstream of the crossings.
"

<https://www.pca.state.mn.us/sites/default/files/wq-b2-04.pdf>

(Doc 38) pgs. 301-2

Roads can impact stream connectivity and have the potential to transport eroded sediments to nearby waters.

<https://www.pca.state.mn.us/sites/default/files/wq-b2-04.pdf>

(Doc 39) pg.303

Roads are a large contributor of concentrated drainage and runoff, often draining runoff to ditches or storm water drains which are designed to act as a conduit for conveying water in an efficient manner to nearby streams or waterbodies. The additive effect serves to increase road connectivity to streams, expanding the channel network (Montgomery, 1994, Booth & Jackson, 1997)."

<https://www.pca.state.mn.us/sites/default/files/wq-b2-04.pdf>.

(Doc 40) pg. 304

CONCLUSION

The B2B project proposer has not provided evidence that the new and cumulative impacts of this route, its phase, related future routes and challenge loops would be mitigated or managed to prevent negative impacts of increased sedimentation to stream habitat and the flora and fauna relying on these waters for survival.

An Environmental Assessment Worksheet should include an evaluation of all stream crossings on the proposed route with a determination of potential impact on water quality from increased levels of 2 way traffic. Any needed mitigations to stream/riparian area crossings should be identified along with costs, a guaranteed funding source and a requirement for completion of work prior to approval and opening of the proposed Route.

ROADS and ROAD SURFACES

Sediment is the greatest pollutant of forest streams. **In the absence of wildfire, forest road networks are usually the main source of sediment in forest watersheds.** An understanding of forest road erosion processes is important to aid in predicting sediment delivery from roads to streams. The flowpath followed by runoff is the key to understanding road erosion processes. On rutted roads, the flowpath follows ruts until a cross drain structure or change of grade is encountered, leading to considerable sediment delivery.

<https://www.fs.usda.gov/treesearch/pubs/34119> , (Doc 41) pg. 305

“Road surfaces can either act as a sediment source or as a conveyance of runoff influencing erosion nearby. Unsealed roads (or native-soil roads) are known to be prime contributors of sediment, often affecting water quality (Luce & Wemple, 2001, Ramos-Scharron & MacDonald, 2007). Unpaved roads have been shown to increase surface erosion by two or

more orders of magnitude compared to adjacent undisturbed hillslopes in the Virgin Islands (Ramos-Scharron & MacDonald, 2007).

Because gravel can also harbor fine sediments in between large coarse fragments; gravel roads can also become a fine sediment source. (Sugden & Woods, 2007)." <https://www.pca.state.mn.us/sites/default/files/wq-b2-04.pdf>.

(Doc 42) pgs. 306-08

CONCLUSION

The implications of the above studies for potential negative environmental impact from the proposed Border to Border Route are the following:

In the Superior National Forest, the vast majority of roads on the proposed Border to Border Route have either gravel or native soils surfaces.

The first of the above mentioned 2 studies found: "Unpaved roads have been shown to increase surface erosion by two or more orders of magnitude compared to adjacent undisturbed hillslopes in the Virgin Islands." And the second study found that gravel roads and native soil roads have the highest levels of erosion, 65% and 78% respectively compared to paved roads (61%).

Information from the Objective Maintenance Level Definitions for Forest System Roads, indicates OML 2 and OML 3 roads are constructed of native soils. OML 2 roads are unmaintained roads and OML 3 roads receiving only "spot surfacing." These 2 studies indicate that much of the proposed Border to Border Route will be on road types prone to the highest levels of erosion of sediments into streams and riparian areas. Importantly, on single lane roads, 2 way traffic at increased levels will elevate erosion run off from vehicles driving partially off road in order to pass one another, as well as destroy buffer zone vegetation that helps prevent further erosion.

In Lake County, there are 38.7 miles of low standard construction USFS roads on the proposed route that, due to funding shortfall, have not been maintained. There is no identified plan or funding in place for maintenance of these roads which will continue to deteriorate at an accelerated pace with increased Border to Border Route traffic. An Environmental Assessment is needed to determine whether due to their current unmaintained, deteriorating condition these roads can still be considered existing roads if they no longer have the existing capability to functionally protect the environment.

An unmaintained, deteriorating road may have the existing capability for high clearance vehicle traffic, but no longer have existing capacity to protect the environment with an increase in high impact traffic, and therefore, should no longer be considered an existing road capable of accommodating Border to Border Route traffic.

ROAD PROXIMITY TO STREAMS / BUFFER ZONES

“Within the transportation network high risk areas for increased sediment and fluvial conveyance exists for roads in close proximity to streams, especially roads draining to ditches which drain directly to streams. This is especially true for all road-stream crossings which serve as a direct connection of roads to streams (Croke et al., 2005). –Dutton, 2012. ” (Lake Superior Streams Sediment Assessment Phase 1, pg. 19)
<https://www.pca.state.mn.us/sites/default/files/wq-b2-04.pdf> (Doc 43) pg.309

“Following MacDonald and Coe (2008) the likelihood of road related sediment conveyance to streams increases as road-stream distances decrease, less than 30 m therefore the minimum connectivity expected for study watersheds is 5.11-6.92% (30.5 m). Channel initiation processes observed in the field were incorporated into the investigation of road connectivity. On a per site level, gully processes were found to increase drainage area by 0.53-0.99%.”

<https://www.pca.state.mn.us/sites/default/files/wq-b2-04.pdf> (Doc 44) pg. 310

The buffer is frequently vegetated except after wildfires. In most conditions, it is an area of high infiltration leading to deposition as the transport capacity of the overland flow is reduced. The effectiveness of the buffer is dependent on the length of road generating runoff, and the length of buffer absorbing it. The effectiveness also varies with the water content of the buffer. For large runoff events on shorter buffers, a significant amount of runoff will pass over the buffer, along with the entrained sediment. On smaller storms, sediment will be deposited near the road.

Sediment plumes are frequently visible in forest buffers, but the presence of a plume from small event deposition does not necessarily imply that there was no sediment carried across the buffer from a large runoff event (e.g. Grace and Elliot, 2008). Buffers are less effective in wetter climates in absorbing runoff and reducing sediment delivery."

Inadequate buffer zones at stream and riparian area crossings on single lane roads with increased levels of 2 way traffic will be further compromised by vehicles driving partially off road in order to pass one another.

<https://www.fs.usda.gov/treesearch/pubs/34119> (Doc 45) pg. 311

Off road vehicle Best Management Practices for Forestlands from the Journal of Conservation Planning states:

Locate routes a minimum distance (as listed below) from waterbodies and wetlands:

- **Fish-bearing streams and lakes** – 91 m (300 ft)
- Permanently flowing non-fish-bearing streams – 46 m (150 ft)
- Ponds, reservoirs, and wetlands greater than one acre – 46 m (150 ft)

- **Do not designate new routes requiring stream crossings and prioritize closure, re-routing or creating bridge crossings for existing routes that have stream crossings.**

https://www.lsohc.leg.mn/materials/16_Mtg/Dec_14_2016_ATV.pdf, pg 15.

(Doc 46) pgs. 312-13

Photos on the following pages of the Proposed Border to Border Route in Lake County show examples of road types and the potential for the following:

- Low standard construction roads subject to pooling of water and flooding - Road-stream connectivity
- Insufficient buffer zones to streams, wetlands and lakes
- Flow paths creating rutting - Sediment erosion increasing runoff to waters
- Narrow single lane roads for a 2-way designated route requiring vehicles to go off road to pass one another, destroying buffer zone vegetation which diminishes erosion control, as well as enables vehicles to both pick up and drop of invasive species seeds.
- Vehicles passing through pooled water, significantly increases the probability of seeds being washed off, thereby significantly increasing the probability of invasive species spread.

Watershed risk impacts of a designated, highway licensed OHV route on unpaved roads, with insufficient buffer zones and increased traffic volume which would include OHV clubs and Jeep Jamboree events with large numbers of vehicles, have the significant potential to also result in :

- Increased sedimentation and fugitive dust pollution to waters at crossings.
- Increased water temperature due to sedimentation and habitat destruction of special fish species and macroinvertebrates that depend on cold, clear water for survival.
- Increased sediment in stream beds that disrupts the natural food chain by destroying the habitat where the smallest stream organisms live, causing massive declines in fish populations.
- Increased sedimentation and fugitive dust pollution of wetlands situated along the edges of gravel roads. This affects wetlands ability to absorb water overflow of rain events and destroys habitat for diversity of wetland life.

In addition :

-Sediment is the greatest pollutant of forest streams.

In the absence of wildfire, forest road networks are usually the main source of sediment in forest watersheds.

<https://www.fs.usda.gov/treesearch/pubs/34119> pgs. 4078-80

-Field Assessment of road impacts on sediment supply

Within the transportation network high risk areas for increased sediment and fluvial conveyance exists for roads in close proximity to streams, especially roads draining to ditches which drain directly to streams

<https://www.pca.state.mn.us/sites/default/files/wq-b2-04.pdf>

-Unsealed roads (or native-soil roads) are known to be prime contributors of sediment, often affecting water quality (Luce & Wemple, 2001, Ramos-Scharron & MacDonald, 2007).

-Road surfaces can either act as a sediment source or as a conveyance of runoff influencing erosion nearby.

<https://www.pca.state.mn.us/sites/default/files/wq-b2-04.pdf>. Appendix 1, pgs. 1,21,22 / 124

-Rutting and Road maintenance

Ruts tend to concentrate the flow on the surface, and generally increase surface erosion rate and sediment delivery to streams. To minimize surface erosion, a management strategy is needed to minimize rut development. Surface ruts can be reduced by limiting traffic, particularly in wet weather, by regular maintenance with a grader, by the application of high quality aggregate.

<https://www.fs.usda.gov/treesearch/pubs/34119> pgs. 4078-80.

-Photos of the proposed route on next pages-













CONCLUSION

Buffer zones at stream crossings on the proposed route do not exist in some areas or are only a few feet wide. These insufficient buffer zones at stream crossings, with an increase in traffic, would create the significant potential of fugitive dust and sedimentation pollution entering waters. This increased sedimentation would risk threatening the survival of sensitive cold water fish species and macroinvertebrates.

Implications from the above studies for potential negative environmental impact from the proposed Border to Border Route: Narrow, single lane, minimally constructed roads with little or no shoulders and ditches such as OML 2 and OML 3 roads (see page 119) have very close proximity (short buffers) to the streams and riparian areas they cross, enabling increased levels of sediments to enter waters. This would be further increased by higher levels of vehicle traffic on the proposed designated, nationally advertised Border to Border Route.

Although all roads result in some level of erosion and sediment transfer into adjacent riparian areas this action increases as the distance (buffer) decreases between the road and stream/riparian area crossed.

As indicated in the Grace & Eliot report:

“ For large runoff events on shorter buffers, a significant amount of runoff will pass over the buffer, along with the entrained sediment.

In addition, on narrow single lane roads used for the two way route, going off road to pass vehicles, would result in crushed vegetation, thereby reducing both erosion control and runoff control.

TRAFFIC LEVELS

Roads were developed for traffic, yet trafficking can greatly affect sediment transport and erosion rates along roads. Vehicle traffic (especially heavy vehicle traffic) can encourage rut development and deform the road surface.

If vehicle traffic is seasonal or changes intensity, this can break up the armored road surface creating a highly erodible condition.

Gravel roads aggregates are broken down when forced into the sub-grade, this can decrease hydraulic conductivity and increase runoff and erosion (Reid & Dunne, 1984).

Increased traffic rates on gravel roads are reported to increase sediment concentration by 2.7 fold in Marysville Australia (Sheridan et al., 2006). Ramos-Scharron and MacDonald (2005) found greater traffic levels increased the supply of fine material by 2 – 1000 times that of lower levels.

Even temporary changes in usage can amount to large differences in road sediment losses, as noted by Reid and Dunno (1984) whom compared weekdays to weekends finding a 7.5 rate increase for weekends”

<https://www.pca.state.mn.us/sites/default/files/wq-b2-04.pdf>.

(Doc 47) pgs. 314-17

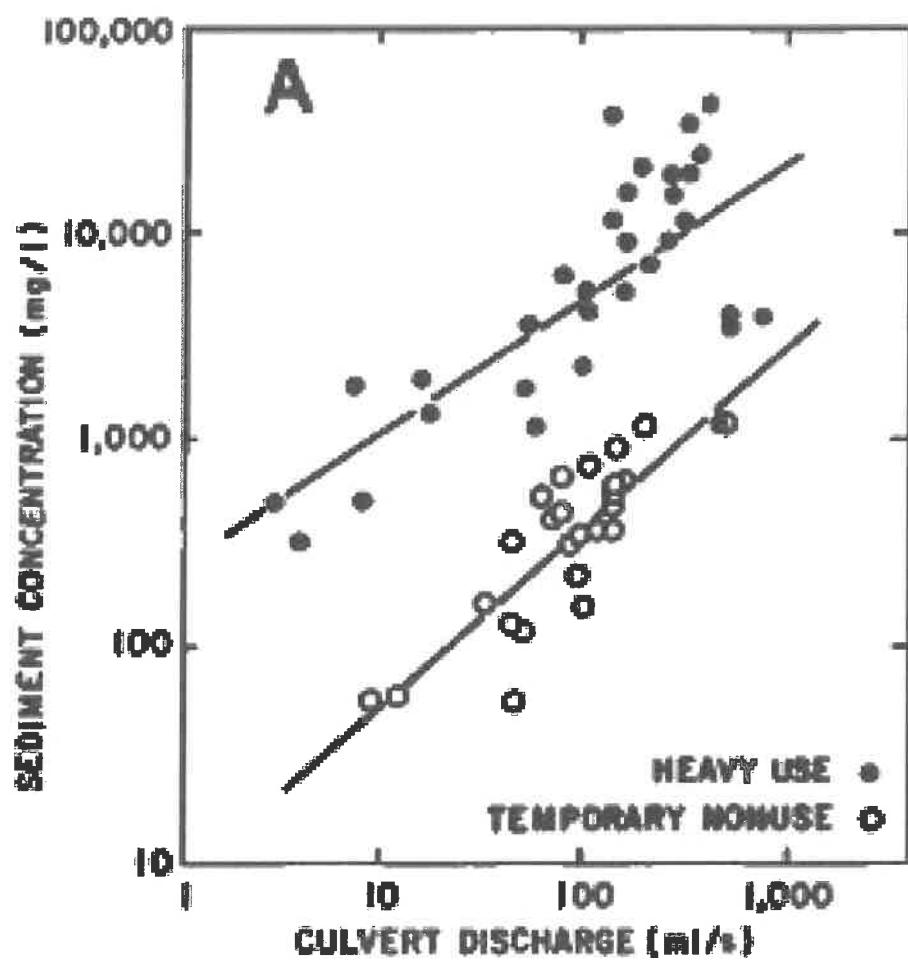


Figure 6. Sediment concentrations as a result of traffic usage (from Reid and Dunne 1984) (Lake Superior Streams Sediment Assessment Phase 1 <https://www.pca.state.mn.us/sites/default/files/wq-b2-04.pdf>. pg. 25/124

Survey sites were visited once in the summer of 2010, with the assumption that observed traffic patterns may fluctuate by the hour, weekday and seasonally. To counteract possible bias, roads were given a binary indicator of "1" if in use or "0" if closed and vegetated. Using logistic regression the presence of erosion was best predicted at the road segment scale by traffic ($p=0.1326$, weighted AIC = 0.5924).

Low levels of traffic had a negative relationship to the presence of erosion, therefore minimally trafficked roads were observed to have limited erosion observations.

<https://www.pca.state.mn.us/sites/default/files/wq-b2-04.pdf>.

(Doc 48) pg.318

QUANTIFYING TRAIL EROSION AND STREAM SEDIMENTATION WITH SEDIMENT TRACERS

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Abstract--The impacts of forest disturbance and roads on stream sedimentation have been rigorously investigated and documented. While historical research on turbidity and suspended sediments has been thorough, studies of stream bed sedimentation have typically relied on semi-quantitative measures such as embeddedness or marginal pool depth.

To directly quantify the impacts of a functioning off-highway vehicle (OHV) trail on stream sedimentation, we employed a marked-recapture sediment tracer approach that allowed us to directly measure the movement of sand eroded from the trail and transported through the stream. We seeded a controlled section of an operating OHV trail with manufactured limestone sand (MLS). Fine fractions of the MLS were washed from the road and increased stream water calcium concentrations, $[Ca^{2+}]$.

Stream water $[Ca^{2+}]$ began to return to pretreatment levels within 12 weeks.

Coarser fractions, greater than 0.5 mm, were eroded from the road with rain events and moved along the study reach in pulses. Much of the coarse sediment appeared to be within the study reach eight weeks following application of the tracer. **Tracer results and estimated stream bed sediment transport times indicated the small section of OHV trail had contributed at least 2.45 kg (302 kg/ha) of coarse sediment to the stream bed in 8 weeks (1,960 kg/ha/yr).**

Bed Material Sediment

Sedimentation of the streambed in response to the MLS tracer application developed over time and occurred in pulses. **Runoff from individual rain events washed new sediments into the stream while those from previous storms were transported short distances down stream or flushed entirely from the reach. As no MLS was detected immediately downstream of the junction between the study reach and Raper Creek, these events must have flushed the MLS sediments beyond the study boundary. Despite these large flushing events, additional MLS was still being transported from the OHV trail to the stream at rates approximately 400 times greater than background levels (100 ppm vs. 0.25 ppm).** This was evident as subsequent pulses of the MLS were detected in stream bed sediments. This result suggested there was a mechanism that influenced the availability of coarse sediments for erosion from the trail. The

Author suggests the most likely mechanism would be OHV traffic and disturbance of the trail surface.

Conclusions of the study

The results of this study were preliminary in nature as they have not been replicated. **Despite this, they indicated the OHV trail was having enormous impacts on water quality, sediment yield and stream bed sedimentation in the study reach.**

Most importantly, the use of MLS as a sediment tracer showed great promise as a tool to document soil erosion impacts on stream water quality and stream bed sedimentation.

This method allowed for the direct quantification of sand and fine gravel transport into, through, and out of the stream bed. **These processes define stream bed sedimentation and strongly influence stream ecology by affecting nutrient cycling (Boulton and others, 1998), development of aquatic invertebrate communities (Chiao and Wallace, 2003), and ultimately the survival and reproduction of numerous river fishes (Suttle and others, 2004).**"

https://www.srs.fs.usda.gov/pubs/ja/ja_riedel001.pdf

ROAD-EFFECT ZONE

Road-effect Zone

Not surprisingly, the highly diverse ecological effects of roads vary widely in how far outward they extend from the road. These distances of significant impacts from the road surface have been summarized by Reck & Kaule (1993) and Forman (1995), and vary from a few meters to a few kilometers (Fig. 3).

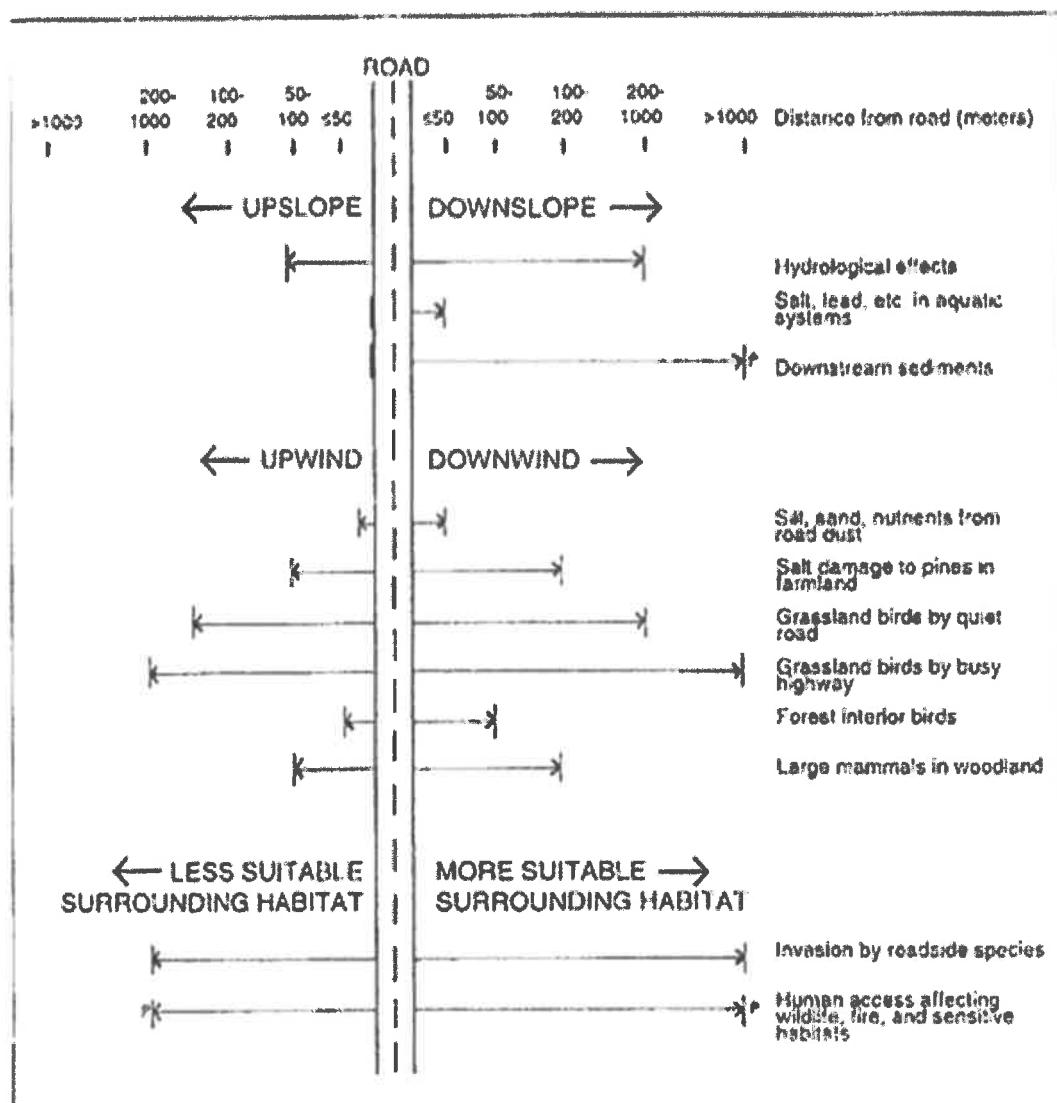
Most ecological effects are relatively continuous along a road. However, a few effects are concentrated at specific spots, such as sedimentation downstream of a bridge or hunting effects around a human access point in a remote area (Fig 3).

Finally, the road-effect zone is many times wider than the road surface with its roadsides. For example, let us assume that the average road and roadside is 30 m (e.g., road surface 10 m, plus the combined width of adjacent 10 m roadsides, which may include scraped, mowed, ditched, etc. areas) for the 6 million kilometers of public roads covering one percent of the contiguous United States. Then averaging the lengths of arrows in Fig. 3 provides a conservative estimate that direct ecological effects extend over a distance

of 400 m width (some 200 m on each side of the road surface). Dividing 400 by 30 suggests that direct ecological effects extend over an area >10 times the road/roadside width, though note that both the numerator and denominator are rough estimates and that many variables are involved. Nevertheless, as a preliminary hypothesis, more than 10% of the contiguous United States is directly impacted ecologically by roads.

http://www.lauxen.net/conecte/referencias/Forman_1997a.pdf

(Doc 49) pgs. 319-321



FUGITIVE DUST POLLUTION

Monitoring fugitive dust emissions from off highway vehicles traveling on unpaved roads and trails using passive samplers

Abstract: “ Vehicles traveling on dry, unpaved roads generate copious quantities of fugitive dust that contribute to soil erosion and potentially threatens human health and ecosystems. The purpose of this study was to develop a low-cost technique for monitoring road dust that would enable land managers to estimate soil loss.

“ The results showed that the dust plume created by vehicle traffic was heterogenous: larger particles were in the lower part of the plume and deposited closer to the source , smaller particles were carried higher in the plume and traveled at least 100 meters (328 feet) away from the source.”

“The study demonstrated that OHV traffic contributes to a substantial erosion of roadbeds because of aeolian transport.”

Fugitive dust plumes on unpaved roads have been measured to travel as far as 100 meters (328 feet).



"Off-highway traffic on unpaved roads clearly disturbs the roadbeds, loosening the surface increasing the potential of surface erosion during rain events and aeolian transport when it is dry. Erosion of road surfaces during rain not only damages the road, but can also lead to siltation of streams and wetlands, harming habitat, degrading water quality and potentially impacting drinking water resources.

Aeolian transport of dust during dry spells leads to accumulation of dust on roadside vegetation, which can impair foliar function by reducing photosynthetic capacity and gas exchange. (Farmer 1993; Granz et al. 2003). Fugitive dust also damages foliage by abrading surfaces reducing the integrity of the cuticle boundary (Eveling 1986). And clouds of dust are irritating to human lungs; prolonged exposure may lead to long term impairment of pulmonary capacity."

"There were many different types of vehicles on the trails, from small 150 cc motorcycles to large four wheel drive pick-up trucks- undoubtedly , the larger the vehicle generated more dust.

(Gilles et al. 2005)."

Monitoring Fugitive Dust Emissions from Off-highway vehicles traveling on unpaved roads and trails using passive samplers (Doc 50) pgs.322-332

STRESSORS TO AQUATIC LIFE

The MPCA states the stressors to sensitive cold water aquatic life and macroinvertebrates that populate the exceptional streams and tributaries in the LSN along the proposed B2B route are:

Stressors and Sources:

- **High water temperatures** that do not support cold water species such as brook trout.

Causes of high water temperatures may include beaver dams, **turbid water**, loss of vegetation and shade, low flows, low groundwater input and climate change.

- **Physical habitat degradation and loss of habitat diversity** that reduces spawning areas, cover or pool for fish, and critical habitat for aquatic macroinvertebrates. Habitat loss can be due to bank erosion (caused by channel incisions and widening), sediment deposition, beaver dams, **road and ditch run off**, **major flooding events**, **sediment transport issues related to road culverts and invasive species that have the potential to affect hydrology and aquatic organisms**.

- **High Sediment and associated nutrient concentrations** that are a result of high magnitude, low frequency snowmelt and precipitation events. Sediment and nutrient sources are varied:

Streambank and valley wall erosion

- **Watershed run off from open lands, gravel and dirt roads**, and development and impervious surfaces (eg **roads**, **driveways**, **ditches/conveyances**, **culverts**, **crossings**, **other land management activities**.)

<https://www.pca.state.mn.us/sites/default/files/wq-ws4-51a.pdf> (Doc 51)pgs.334-35

In a review of literature by the Backcountry and Anglers it states:

" All-terrain vehicle operation in or near streams and waterways poses a serious water pollution threat (Havlick 2002). This can have detrimental impacts on populations of aquatic animals. (Garret 2001) as cited in Taylor 2006) reported that environmentally sensitive aquatic species (including fish) were absent from OHV impacted sites on the Nueces River in Texas, while unimpacted sites hosted numerous environmentally sensitive species.

https://www.lsohc.leg.mn/materials/16_Mtg/DEC_14_2016_ORV_WHITE_PAPER_BackcountryHuntersAnglersofAmerica.pdf

(Doc 52) pg. 336-38

Many of the watershed's streams support sensitive, stenothermic organisms that depend on perennial, cold water streams carrying low concentrations of sediment and nutrients.

LSN Watershed and Monitoring Assessment report, 2017

<https://www.pca.state.mn.us/sites/default/files/wq-ws3-04010101b.pdf>

(Doc 53) pg.339

Fugitive dust and sedimentation clouds the water and makes it difficult for fish and other aquatic life to find food, breathe and reproduce.

MPCA report, April 2015, Swimmable, fishable, fixable?

(Doc 54) pg.341-42

" These streams(referring to the 40% exceptional streams in the LSN watershed) typically contain Brook Trout and other fishes that require clean, cold water, including species that are rarely found outside of Lake Superior- North Watershed (e.g. Longnose Sucker. Lake Chub, a state listed Species of Special Concern was found in several streams in the far northeast corner of the watershed.

<https://www.pca.state.mn.us/sites/default/files/wq-ws3-04010101b.pdf> (Doc 55)pg.343

Understanding and controlling the impacts of sedimentation is crucial to maintain the ecological fitness of river systems.

Excessive loading can have catastrophic effect on river ecosystem function. The main direct physical effect are reduction in habitat availability and modification of habitat biogeochemical conditions through reduction of oxygen and increased concentrations of toxic compounds (Kemp et al. 2011; Jones et al 2012). Sediment suspended in the water column can also cause sublethal effects from turbidity and direct physical damage, particularly to fish species (Wilber & Clarke 2001).

Sediment can trigger invertebrate decline in various ways including: scour damage, burial of heavy or immobile species, the clogging of gills or feeding structures and reduction in interstitial habitat and primary production. (Newcombe and MacDonald, 1991)

The consequences of increased suspended sediment concentrations on fish are also include

- Mortality
- Reduction in suitable spawning habitat and declines in egg/early life stage success
- Gill irritation and trauma
- Altered blood physiology
- Altered movement/ swimming performance
- Changed foraging behavior and reduced territoriality

<https://www.salmontrout.org/wp-content/uploads/2017/09/STC-The-impact-of-excess-fine-sediment-on-invertebrates-and-fish-in-riverine-systems.pdf> (Doc 56) pgs.-344-57

TROUT STREAMS

As noted, trout are sensitive cold water fish. They will seek to move to new locations when temperature changes vary by little more and 1 to 4 degrees fahrenheit .

(Doc 57 & 58) pgs. 358-360

Part of their diet consists of aquatic insects and small fish whose population are negatively impacted by increased runoff and sedimentation. A study of 33 coldwater streams in Wisconsin and Minnesota found that when impervious surfaces covered 11% of a watershed, trout were eliminated from streams.

(Doc 59) pgs.361-62

In the Rainy River Headwaters watershed, some drainages provide excellent brook trout habitat. The Isabella River, which is crossed by the proposed route, is a stream dominated system with many cold water stream resources that produce a vibrant brook trout population.

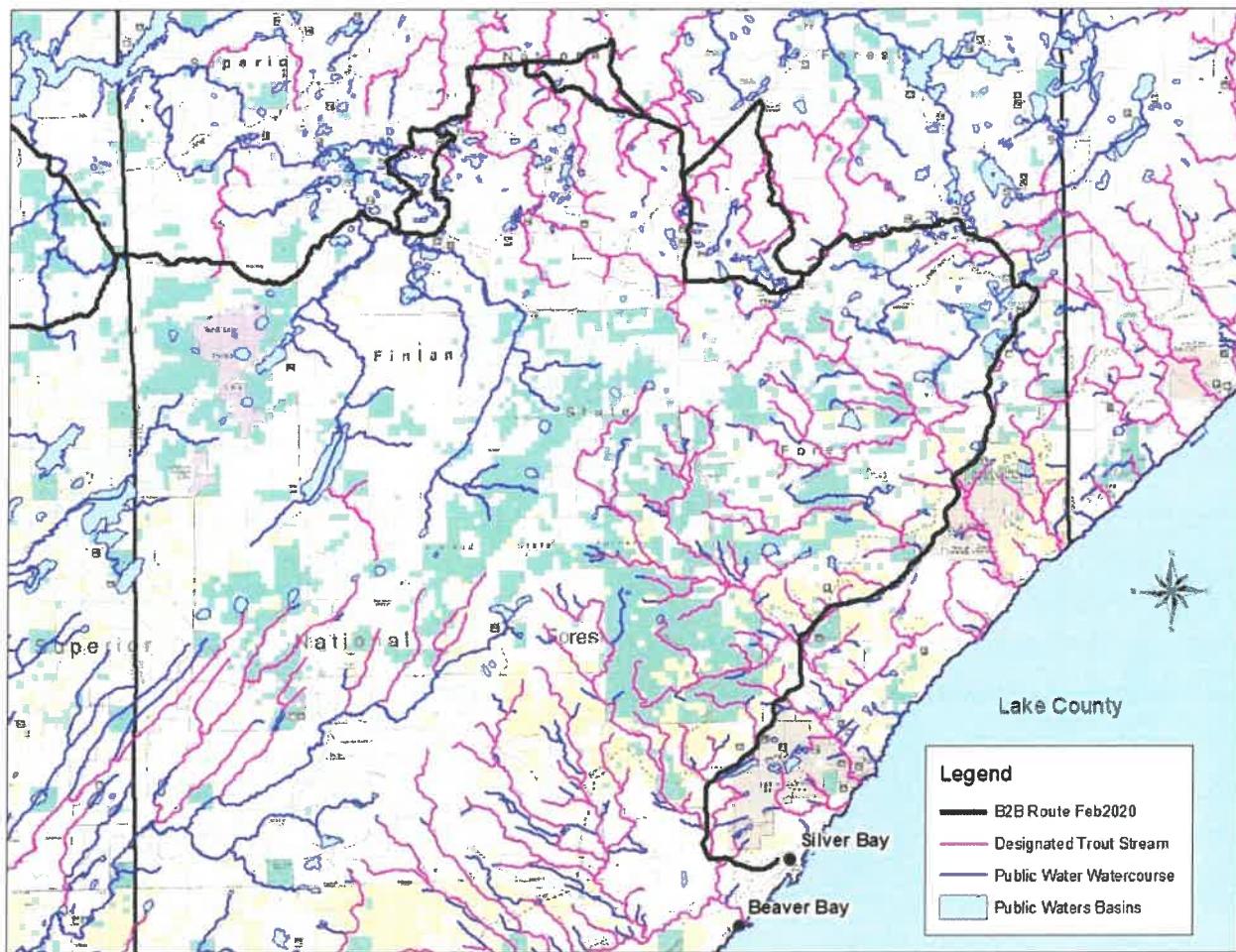
Some of the streams that are designated cold water include streams that are crossed by the proposed Border to Border route : Arrowhead, Dumbell, Inga, Little Isabella, and Mitawan.

<https://www.pca.state.mn.us/sites/default/files/wq-ws3-09030001b.pdf>

(Doc 60) 363-64

MN DNR TROUT Rivers and Streams crossings

27 MN DNR Trout streams would be crossed on unpaved roads 61 times, within the Lake County portion of the Superior National Forest, which encompasses the Rainy River-Headwaters and Lake Superior-North Watersheds.



1. Nip Creek
2. Camp East Creek
3. Little Isabella River/Sphagnum Creek
4. Inga Creek
5. Mitawan Creek
6. Jack Pine Creek
7. West Camp Creek
8. Camp Creek
9. Arrowhead Creek
10. Dumbell River
11. Trappers Creek
12. Scott Creek
13. Houghtaling Creek
14. Two Island River
15. Moose Creek
16. Ninemile Creek
17. Manitou River
18. Rock Cut Creek
19. Blesener Creek
20. East Branch Baptism River
21. Egge Creek
22. West Branch Baptism River
23. Baptism River Tributaries
24. Lindstrom Creek
25. Nicado Creek
26. East Branch Forty Three Creek
27. East Branch Beaver River

(MN Legislature Office of Revisor Statutes List of MN Trout streams by county)

<https://www.revisor.mn.gov/rules/6264.0050/> (MN DNR Trout Angling-North Shore Inland Maps)

https://files.dnr.state.mn.us/maps/trout_streams/northeast/maps9-20.pdf SOURCES: (Doc 61)pg.365

ALL STREAM AND RIVER CROSSINGS BY THE PROPOSED ROUTE IN THE RAINY RIVER HEADWATERS AND LAKE SUPERIOR NORTH WATERSHEDS

31 different streams that would be crossed 63 times.

Below is a complete list of stream crossings, including all MN DNR Trout streams and Exceptional MPCA ranked streams, within the Lake County portion of the Superior National Forest, which encompasses the Rainy River-Headwaters and Lake Superior-North Watersheds that would be crossed by the proposed Border to Border Route for Highway Licensed Off Road vehicles.

Rainy River-Headwaters Watershed

1. Nip Creek
2. Stony River
3. Stony River Tributary (unnamed)
4. Camp East Creek
5. Little Isabella River/Sphagnum Creek
6. Inga Creek
7. Mitawan Creek
8. Jack Pine Creek
9. West Camp Creek
10. Camp Creek
11. Arrowhead Creek
12. Dumbell River
13. Trappers Creek
14. Scott Creek
15. Unnamed Creek connecting Scott Creek and Homestead Lake
16. Elixir Lake/Fulton Creek headwaters

Lake Superior North Watershed

17. Houghtaling Creek
18. Two Island River
19. Moose Creek
20. Ninemile Creek
21. Manitou River
22. Rock Cut Creek
23. Blesener Creek
24. East Branch Baptism River
25. Egge Creek
26. West Branch Baptism River
27. Baptism River Tributaries
28. Lindstrom Creek
29. Nicado Creek
30. East Branch Forty Three Creek
31. East Branch Beaver River

EXCEPTIONAL MPCA ranked Water Crossings

9 Exceptional Streams are crossed 24 times.

These Exceptional waters, designated as outstanding stream resources, are classified to receive special protection strategies by the MPCA and to receive additional protections from a more stringent water quality standard. Streams that have exceptional performing biological, chemical, and physical parameters are worthy of additional protection in order to preserve them.

<https://www.pca.state.mn.us/sites/default/files/wq-ws3-09030001b.pdf>

(Doc 62) pg.366-67

Aquatic life use protections are divided into 3 tiers of biocriteria: Exceptional, General and Modified. Exceptional use waters support fish and macroinvertebrate communities that have minimal changes in structure and function from natural condition.

<https://www.pca.state.mn.us/sites/default/files/wq-ws3-04010101b.pdf>

(Doc 63) pg. 368

Within the Lake County portion of the Superior National Forest, which encompasses the Rainy River-Headwaters and Lake Superior-North Watersheds, the following MPCA designated **EXCEPTIONAL WATERS** rivers and streams would be crossed by the proposed Border to Border Route for Highway Licensed Off Road vehicles.

Rainy River Headwaters Watershed

1. Little Isabella River
2. Mitawan Creek
3. Jack Pine Creek
4. Arrowhead Creek

Lake Superior North Watershed

5. Houghtaling Creek
6. Two Island River
7. Manitou River
8. East Branch Baptism River
9. West Branch Baptism River

Prohibited Protection Waters and stream crossings

Prohibited Protection Waters

3 Streams crossed 8 times

3 Minnesota Statute PROHIBITED PROTECTION WATERS (listed below) would be crossed within the Lake County portion of the Superior National Forest which encompasses the Rainy River-Headwaters Watershed.

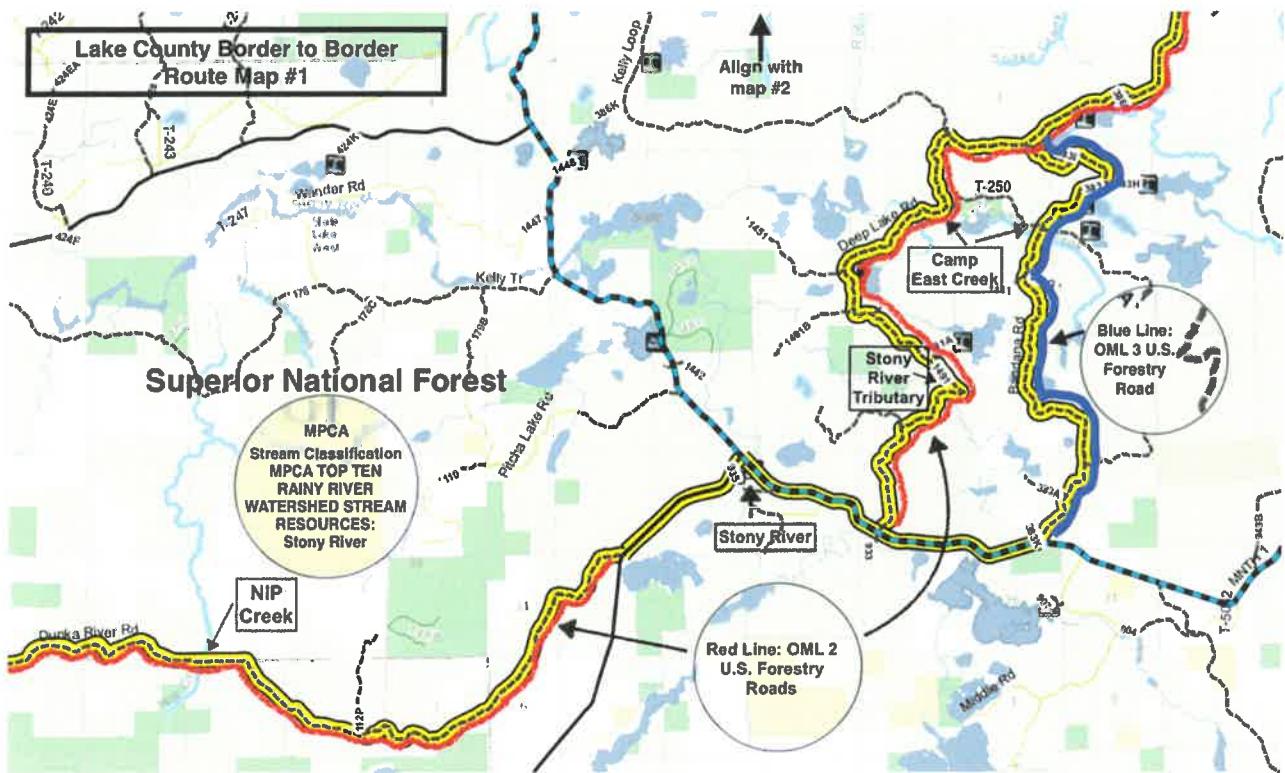
The Boundary Waters Canoe Area Wilderness also has PROHIBITED PROTECTION WATERS status and receives inflow from 16 rivers and streams that would be crossed on unpaved roads by the proposed Route in Lake County.

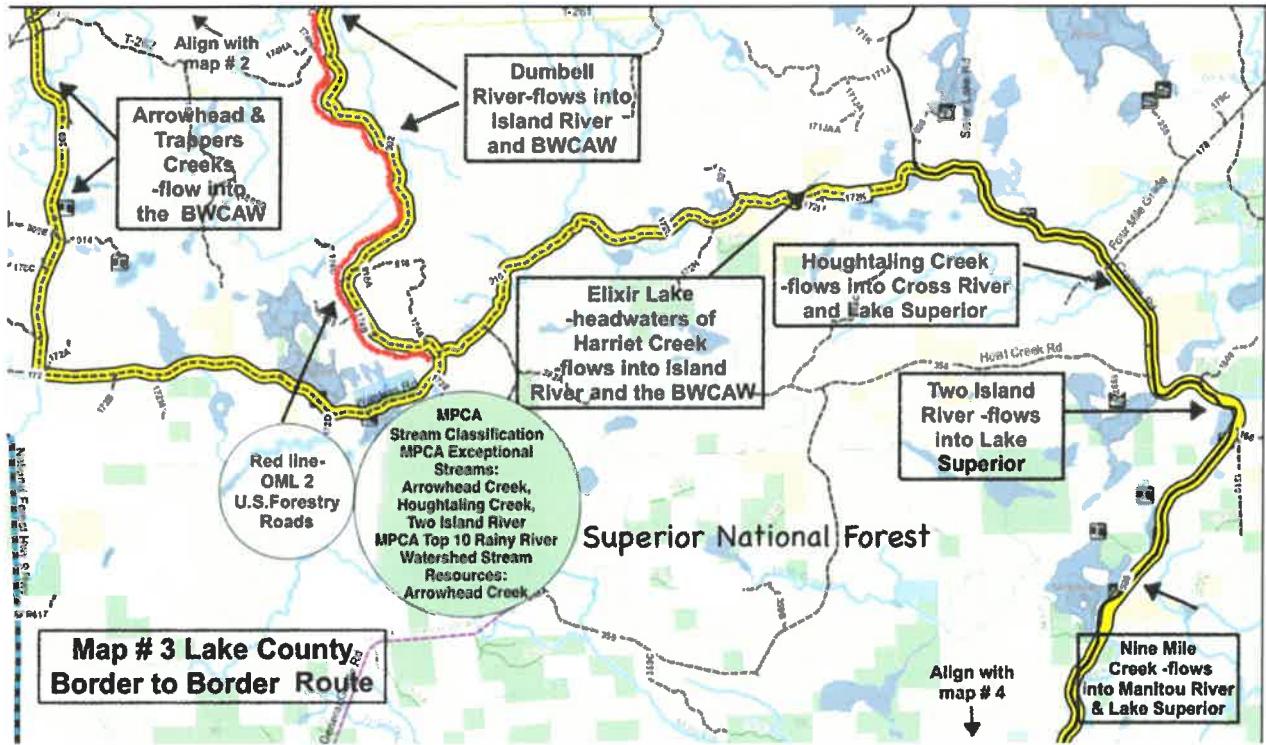
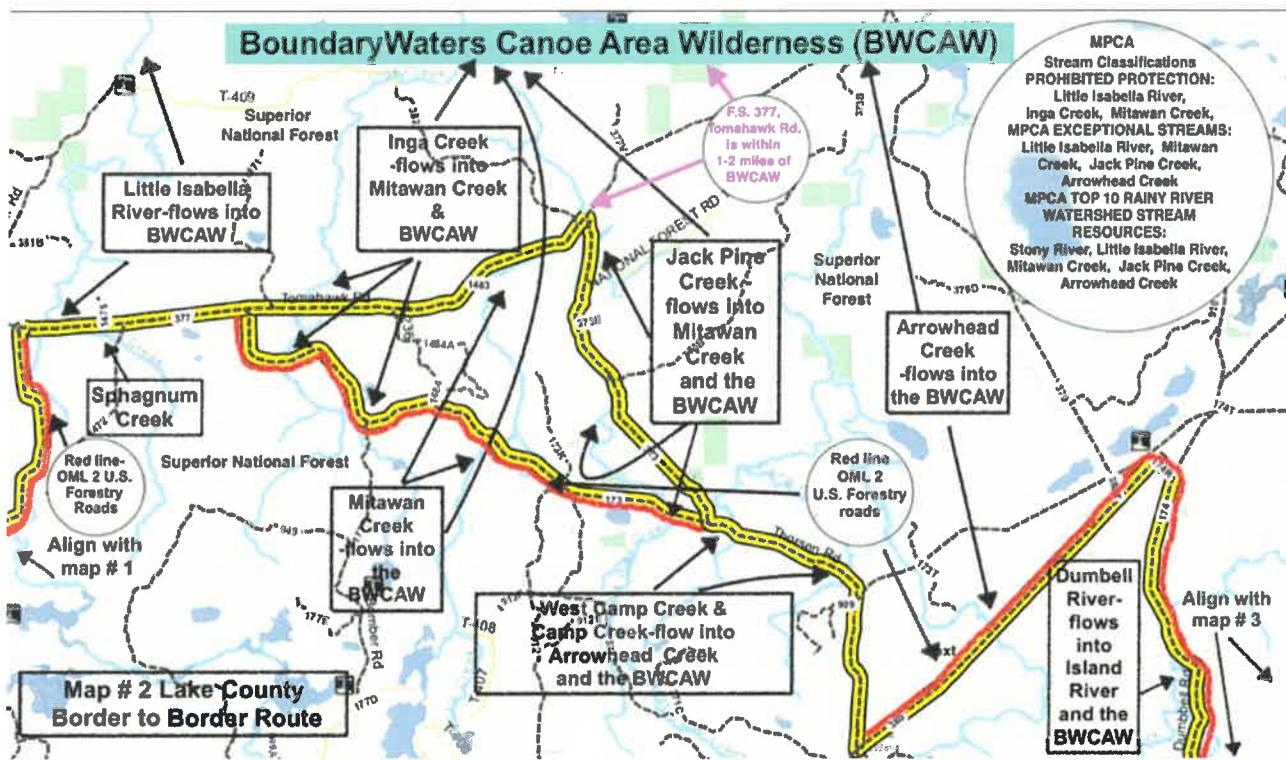
By Minnesota Law, "the exceptional characteristics of specific waters designated in Minnesota rules as outstanding, very sensitive or unique resource value waters-called "outstanding resource value waters" or ORVWs (Minn.R. 7050.0335)—must be maintained and protected. ORVWs listed as prohibited include the Boundary Waters Canoe Area Wilderness and the streams mentioned below." "New or expanded discharges are banned in these and other prohibited waters." <https://www.pca.state.mn.us/water/water-quality-standards>

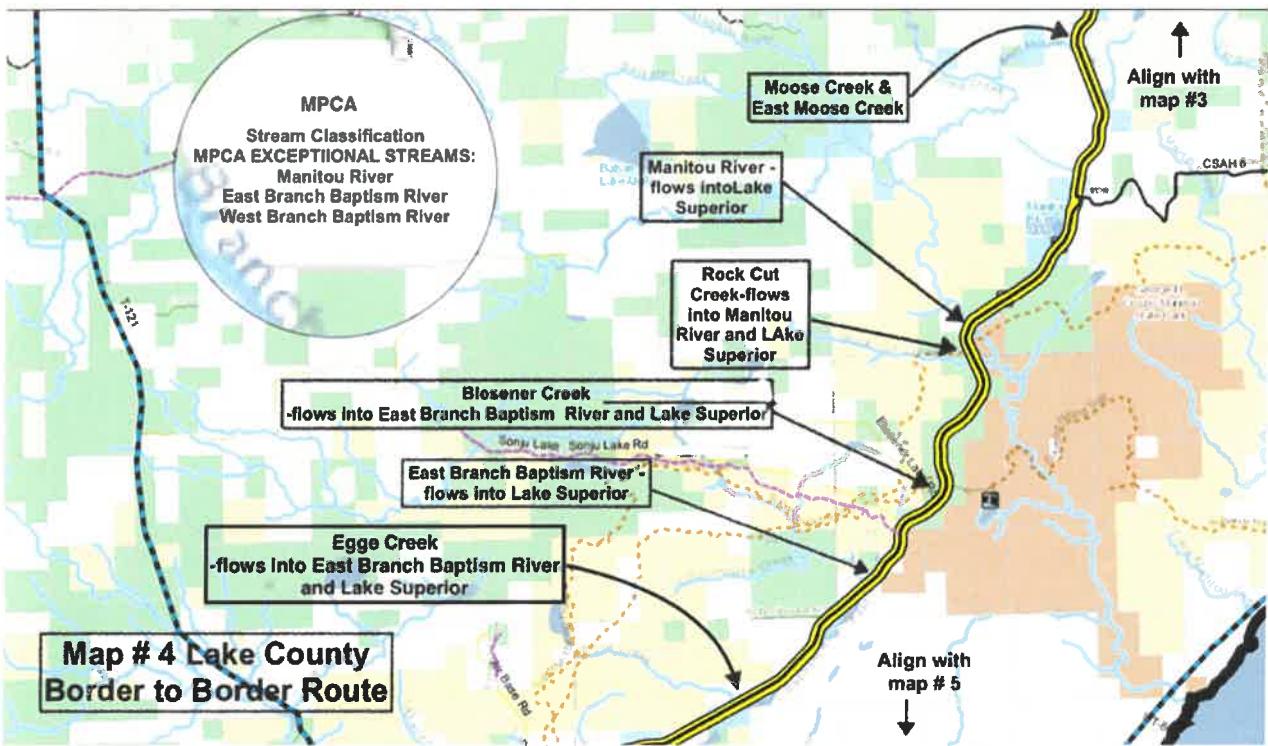
Rainy River Watershed

1. Little Isabella River
2. Inga Creek
3. Mitawan Creek
4. Boundary Waters Canoe Area Wilderness

Maps of waters crossed by the proposed route in Lake County









RAINY RIVER HEADWATERS WATERSHED

16 rivers, creeks and tributaries would be crossed 29 times in the Rainy River Headwaters Watershed portion of Lake County by the proposed Border to Border Route .

4 of the streams crossed are Exceptional MPCA ranked.

3 of the streams crossed are Prohibited Protection Status, MPCA ranked.

All of the waters crossed drain into Boundary Waters, which are MPCA ranked Outstanding Resource Value Prohibited Protection Status waters.

To protect and maintain existing high water quality uses, all waters, including wetlands, within the BWC AW and those within Voyagers National Park are prohibited from receiving net increases in pollutant loading or other causes of degradation in accordance with Minn. (R.ch 7050 parts 0265 and 0270 and MPCA Adopted Permanent Rules Relating to Antidegradation of State Waters 8/2016).

<https://www.pca.state.mn.us/sites/default/files/wq-rule3-61f.pdf>

(Doc 64) pgs. 369-72

-Streams designated as Exceptional receive additional protections from a more stringent water quality standard. (Rainy River-Headwaters Watershed Monitoring and Assessment Report • June 2017.

<https://www.pca.state.mn.us/sites/default/files/wq-ws3-09030001b.pdf>

(Doc 65) pg. 373

-The immaculate waters found within this watershed produce some of the highest quality fisheries in the state

Rainy River Watershed • June 2017, Executive Summary

<https://www.pca.state.mn.us/sites/default/files/wq-ws3-09030001b.pdf>

(Doc 66) pg. 374

The Rainy River Basin has six fish species listed by the state of Minnesota as being of special concern (DNR, August 2013). These species include; *Ichthyomyzon fossor* (northern brook lamprey), *Acipenser fulvescens* (lake sturgeon), *Coregonus zenithicus* (shortjaw cisco), *Couesius plumbeus* (lake chub), *Lepomis gulosus* (warmouth), and *Lepomis peltastes* (northern longear sunfish). Anthropogenic stressors were few throughout this watershed and resulted in sufficient habitat and water chemistry to support these assemblages. Overall, the presence of relatively sensitive species and a limited number of tolerant species indicates exceptional water quality.

Rainy River-Headwaters Watershed Monitoring and Assessment Report • June 2017

<https://www.pca.state.mn.us/sites/default/files/wq-ws3-09030001b.pdf>

(Doc 67)pgs. 375-76

Overall, water quality conditions are good to excellent and can be attributed to the forest and wetlands that dominate land cover within the Rainy River-Headwaters Watershed.

The majority of the waterbodies within this watershed had exceptional biological, chemical and physical characteristics that are worthy of additional protection.

(Rainy River -Headwaters Watershed Monitoring and Assessment Report, June 2017,

<https://www.pca.state.mn.us/sites/default/files/wq-ws3-09030001b.pdf>

(Doc 66) pg. 374

Another special feature present throughout the wetlands in the Rainy River watershed is the presence of wild rice. Analysis of a recent compilation of waters known to support wild rice finds 170 locations where wild Rice grows in the Rainy-River-Headwaters Watershed, the majority of these locations are lakes, however 18 locations are emergent or shallow water wetlands. (Rainy River Watershed Report, June 2017

<https://www.pca.state.mn.us/sites/default/files/wq-ws3-09030001b.pdf>

(Doc 68) pg. 377

Impairment found on stream segments within the Rainy River-Headwaters Watershed are likely a function of both natural and anthropogenic stressor. Streams with more erosive soils tend to have higher suspended sediment in lower reaches.

These conditions likely have a natural component, but the suspended sediment can result in stressful conditions for biological communities and may be amplified by poor land use practices.

<https://www.pca.state.mn.us/sites/default/files/wq-ws3-09030001b.pdf> (Doc 22) pg.274

RAINY RIVER-HEADWATERS SUBWATERSHEDS AND WATERS CROSSED

UPPER STONY RIVER SUB WATERSHED

Stony River is crossed by the proposed route.

This is one of the MPCA ranked top 10 stream resources in the Rainy River- Headwaters Watershed. In monitoring, a total of 8 fish species were captured, with several sensitive species present.

F-IBI scores were well above exceptional use threshold. However the M-IBI scores were just below the exceptional threshold.

<https://www.pca.state.mn.us/sites/default/files/wq-ws3-09030001b.pdf>

(Doc 69) pg.378

LITTLE ISABELLA RIVER SUBWATERSHED

Little Isabella River is an Exceptional Stream and a Prohibited Protection Water crossed by the proposed route.

Numerous cold-water streams exist within this subwatershed with robust populations of brook trout .

In-stream habitat was in good condition with the highest overall habitat score (84.08 out of 100) in the Rainy River-Headwaters Watershed . As a result of quality in-stream habitat and good water quality, a relatively diverse fish and macroinvertebrate community was surveyed during monitoring.

The low amount of disturbance within this subwatershed almost assures excellent biological integrity. A portion of this subwatershed had exceptional performing biological, chemical, and physical parameters and are worthy of additional protection in order to preserve them.

A use class analysis was conducted on all assessed waterbodies within the Rainy River-Headwaters Watershed. **Streams designated as exceptional receive additional protections from a more stringent water quality standard.** The upstream reach of the Little Isabella River from its headwaters to Flat Horn Lake, met the exceptional use criteria.

One biological monitoring station (14RN079) was located just upstream of the Little Isabella River Campground (Superior National Forest). All five of the fish visits were above the exceptional use standard, with numerous sensitive fish species present during monitoring. A total of 14 fish species were captured consisting primarily of blacknose dace, brook trout, and longnose dace.

The macroinvertebrate community indicated similar conditions, with a high number of species and several sensitive individuals. The Little Isabella River and its tributaries have a vibrant brook trout population that is well known to local anglers .

The downstream reach (-561) of the Little Isabella River had one biological monitoring station (14RN008) that was monitored just upstream of BWC AW entry point #75 (Little Isabella River). This station had a diversity of in-stream habitat and a variety of fish species

Although the F-IBI is just below the exceptional use threshold, numerous sensitive species (longnose dace, mottled sculpin, blacknose shiner, etc.) were captured including brook trout, which is a sensitive cold-water obligate. The macroinvertebrate community performed well on the M-IBI, with a score (54.66) above the exceptional use threshold. Numerous sensitive species were present during monitoring; including several cold-water obligates (Glossosoma, Brachycentrus, and Rhyacophila).

<https://www.pca.state.mn.us/sites/default/files/wq-ws3-09030001b.pdf>

(Doc 70 & 71) pgs.379-80

MITAWAN CREEK SUB WATERSHED

This entire subwatershed lies within the Superior National Forest, with a portion (18.34%) of it within the BWC AW.

Numerous cold water streams exist within this subwatershed. Most streams throughout this subwatershed are designated trout streams and have a vibrant brook trout population.

<https://www.pca.state.mn.us/sites/default/files/wq-ws3-09030001b.pdf> (Doc 72 & Doc 73)
pgs. 381-82

Mitawan Creek and Jack Pine Creek are Exceptional Creeks, MPCA ranked, crossed by the proposed route. Mitawan Creek enters the BWC AW and is a Prohibited Protection Status Stream.

As a result of quality in-stream habitat and high water quality, a relatively diverse fish and macroinvertebrate community was captured during monitoring. The low amount of disturbance within this subwatershed almost assures excellent biological integrity. Streams that have exceptional performing biological, chemical, and physical parameters are worthy of additional protection in order to preserve them.

A use class analysis was conducted on all assessed waterbodies within The Rainy River-Headwaters Watershed. Streams designated as Exceptional receive additional protections from a more stringent water quality standard. Two stream reaches, **Jack Pine (-564)** and **Mitawan Creek** met all the required parameters for this designation.

Jack Pine Creek , a tributary to Mitawan Creek, is a small headwater stream that supports a robust fish and macroinvertebrate community. The only biological monitoring station (14RN081) located on this reach had a fish community dominated by individuals (creek chub, mottled sculpin, etc.) that are endemic to cold-water streams, including multiple year classes of brook trout.

The average summer temperature (June 1 – August 31) of 16.5 oC is easily within the growth range for brook trout. The macroinvertebrate community was also comprised of several sensitive species, with numerous cold-water obligates present.

<https://www.pca.state.mn.us/sites/default/files/wq-ws3-09030001b.pdf> (Doc 73)pg.382

Mitawan Creek had a total of 14 fish species captured, with the most prevalent being creek chub, blacknose dace, brook trout and mottled sculpin.

Several sensitive cool and cold water obligates were sampled at three stations, indicative of excellent water quality. This reach also had a rich macroinvertebrate community dominated by several sensitive and cold-water obligate species. All of the F-IBI and M-IBI scores met the exceptional use standard, resulting in this reach being designated as Exceptional Use.

<https://www.pca.state.mn.us/sites/default/files/wq-ws3-09030001b.pdf>

(Doc 73)pg. 382

ISLAND RIVER SUB WATERSHED

This entire subwatershed lies within the Superior National Forest, with a small portion (7.00%) of it within the BWC AW.

<https://www.pca.state.mn.us/sites/default/files/wq-ws3-09030001b.pdf>

(Doc 74) pg.383

Arrowhead Creek is crossed by the proposed route. it is one of the MPCA top 10 stream resources indicated by biological and physical parameters.

It is a robust trout stream, with numerous cold water obligates present that is crossed by the proposed route.

West Camp Creek is also crossed by the proposed route and contributes its waters to Arrowhead Creek.

Arrowhead and West Camp both support a robust brook trout fishery, with numerous cold-water obligates present. However, Brook trout were most abundant in Arrowhead creek.

The macroinvertebrate community also consisted of numerous sensitive species, including several cold-water obligates.

<https://www.pca.state.mn.us/sites/default/files/wq-ws3-09030001b.pdf>

(Doc 75) pg. 384

DUMBBELL RIVER SUBWATERSHED

Scott Creek is crossed by the proposed route.

It has several sensitive species of special concern, Ocellated Darner and Boyeria grafiana.

It also has a macroinvertebrate community consisting of several sensitive species.

<https://www.pca.state.mn.us/sites/default/files/wq-ws3-09030001b.pdf>

(Doc 76) pg. 385

RAINY RIVER-HEADWATERS WATERSHED

TABLE OF 10 HIGHEST QUALITY STREAM RESOURCES :

5 of which would be crossed by the proposed route

In the following Table, is a complete list of the top 10 highest quality stream resources within the Rainy River Headwaters watershed as indicated by biological (F-IBI and M-IBI) and physical (MSHA) parameters.

Those streams that have exceptional biological, chemical and physical parameters are worthy of additional protections in order to preserve their valuable aquatic resources.

5 that would be crossed by the proposed route are highlighted in the table on the following page.

<https://www.pca.state.mn.us/sites/default/files/wq-ws3-09030001b.pdf>

(Doc 23) pg. 275

Table 59. Top 10 stream resources in the Rainy River-Headwaters Watershed as indicated by biological and physical parameters.

Bezhik Creek	14RN036
Denley Creek	14RN067
Little Isabella River	14RN079
Mitawan Creek	05RN073, 06RN014, 05RN190
Snake River	14RN064
Jack Pine Creek	14RN081
Cross River	14RN011
Moose River	14RN035, 05RN076, 14RN034
Stony River	14RN073, 14RN072, 05RN074, 14RN007
Arrowhead Creek	10RN070, 14RN086, 14RN085

SEDIMENTATION RISK TO BOUNDARY WATERS classified as Outstanding Resource Value Waters

All 16 streams that would be crossed unpaved roads by the proposed route in the Rainy River-Headwaters, drain into the Boundary Waters and present an increased sedimentation risk to the Boundary Waters, classified as outstanding resource value waters.

Due to the increased traffic load of a designated, nationally advertised, mapped and signed highway licensed OHV route, the potential exists for a significant increase in road surface erosion, run-off and sedimentation, all of which risk being deposited by these stream waters, into the BWCAW.

Refer to Quantifying Erosion and Stream Sedimentation with Sediment Tracers, page 65 of this petition: (https://www.srs.fs.usda.gov/pubs/ia/ja_riedel001.pdf)

The following 3 maps of the proposed Border to Border Route indicate crossings of streams that flow into the BWCAW.

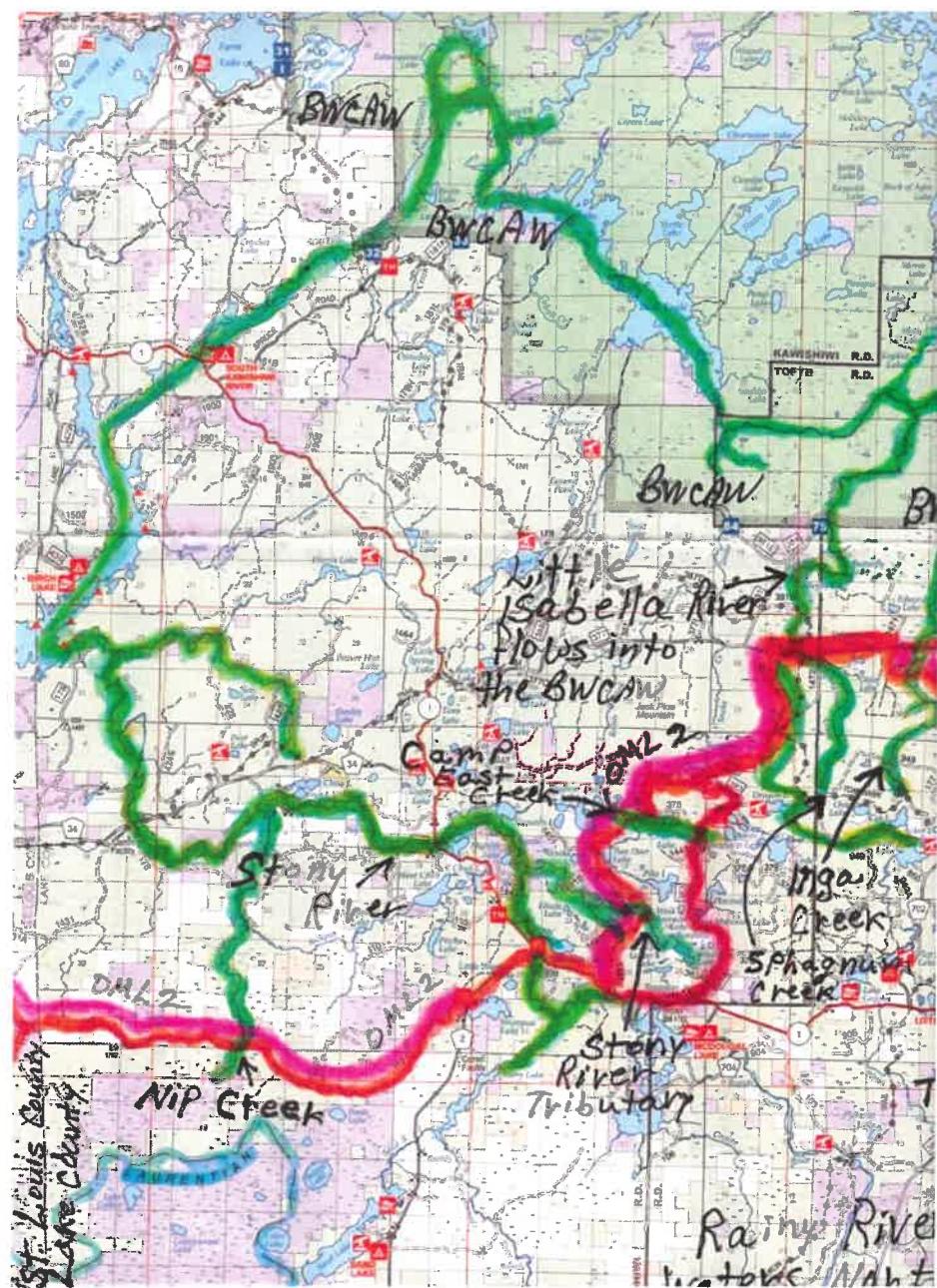
KEY:

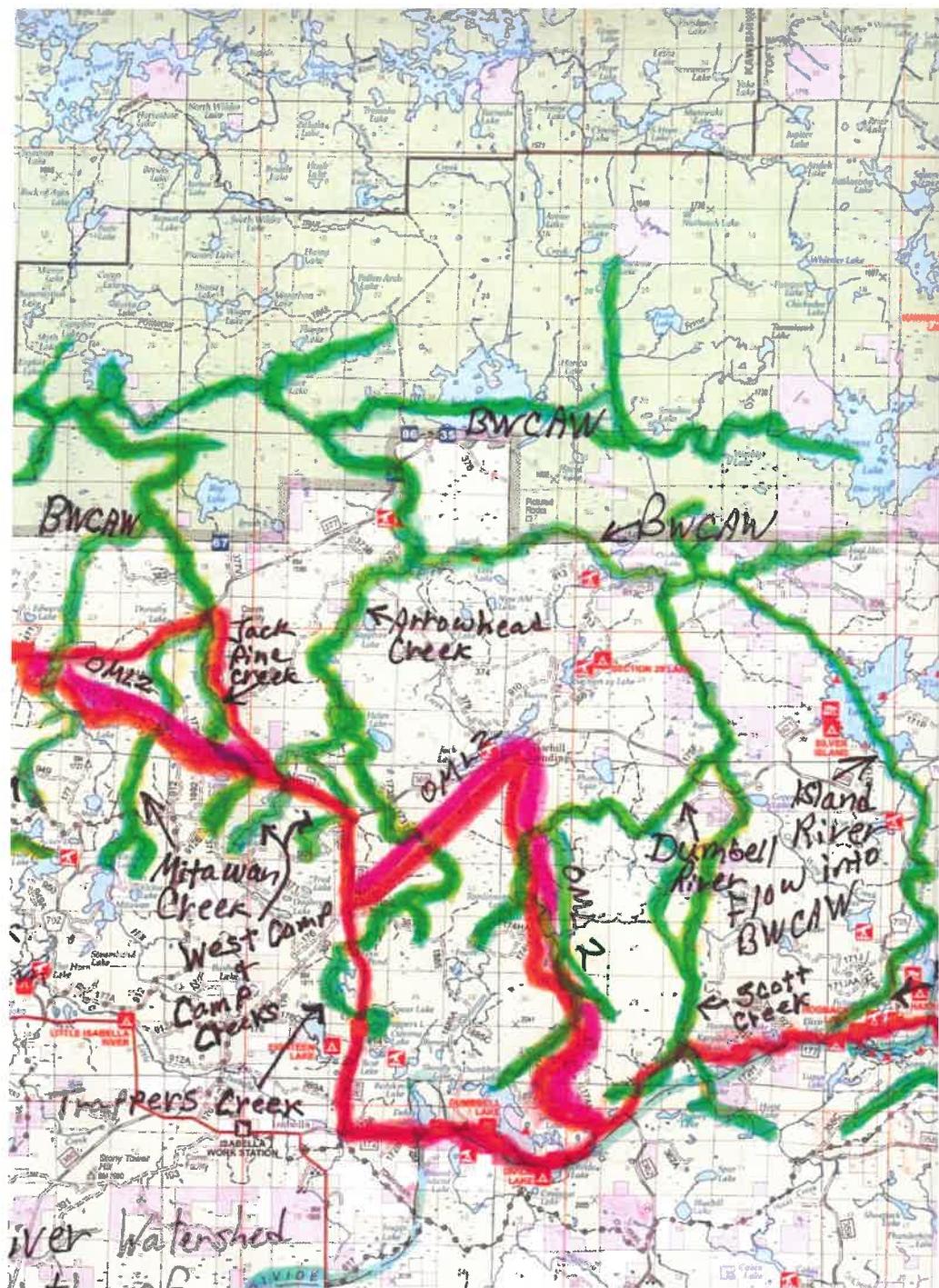
ORANGE- Proposed Route

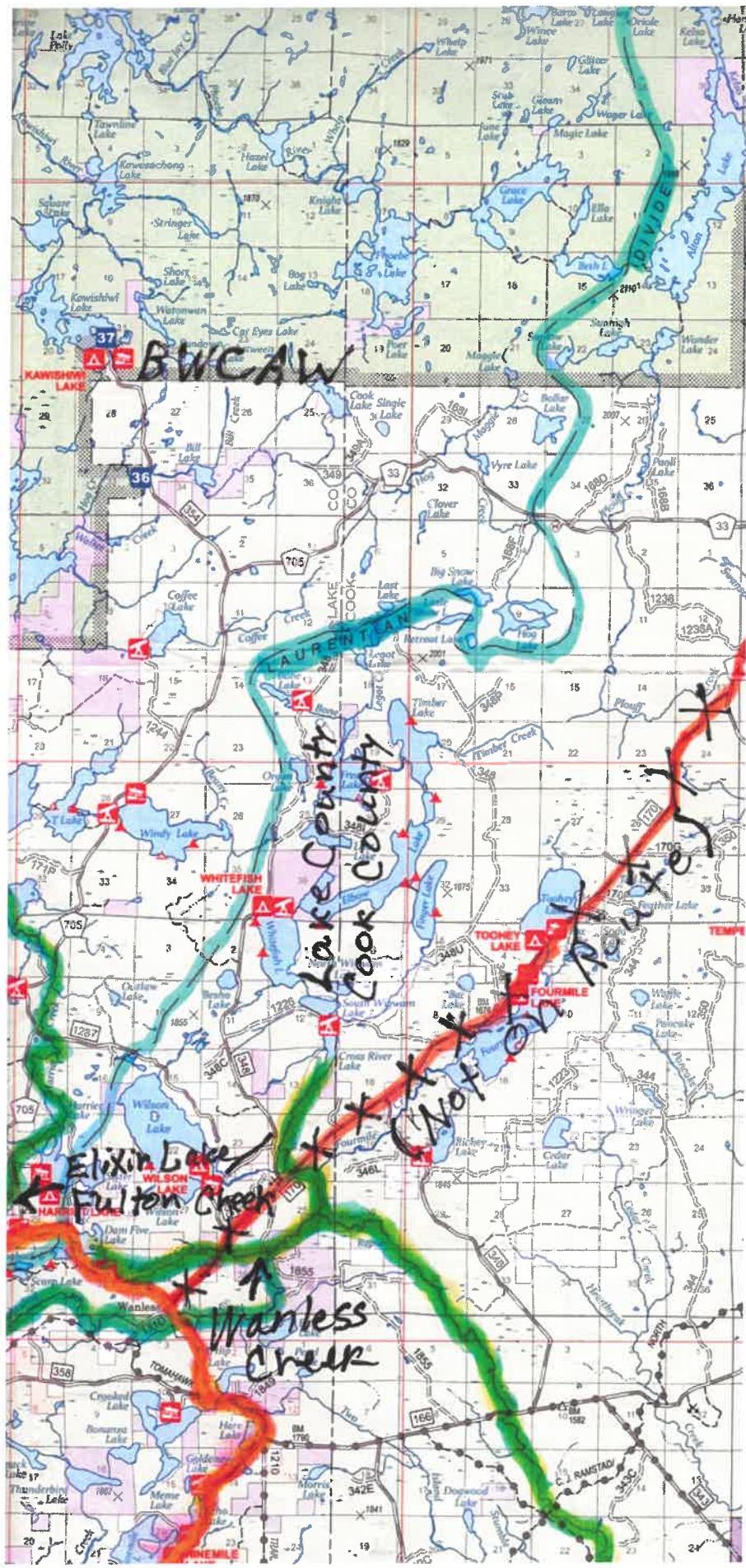
PINK- OML 2 low standard U.S. Forestry roads

GREEN- Streams/Rivers crossed by the proposed route that flow into the BWCAW

BLUE- Laurentian Divide







LAKE SUPERIOR NORTH WATERSHED

15 rivers, creeks and tributaries would be crossed 34 times in the Lake Superior North Watershed portion of Lake County by the proposed Border to Border Route.

5 of the streams crossed are Exceptional MPCA ranked.

All of the these waters that would be crossed on, almost entirely on unpaved roads, pour into Lake Superior, an outstanding international value resource water by Minnesota Rule must be maintained and protected.

Cross River Subwatershed

Protection strategies for the Cross River subwatershed's high quality streams should include a focus on maintaining ecological connectivity through its many road-stream crossings intersections. Emphasis may also be placed on minimizing new road stream crossings where possible.

<https://www.pca.state.mn.us/sites/default/files/wq-ws3-04010101b.pdf>

(Doc 77) pg. 386

Houghtaling Creek and Two Island River are Exceptional MPCA ranked waters that would be crossed by the proposed Border to Border Route.

“ Protection strategies should be developed for these and other high-quality aquatic resources found throughout the subwatershed.”

<https://www.pca.state.mn.us/sites/default/files/wq-ws3-04010101b.pdf>

(Doc 78) pg.387

Houghtaling Creek has high quality cold water habitat meeting the exceptional criteria and has the presence of Brook Trout, Mottled Sculpin and macroinvertebrates that require cold clear water.

Apsectroptanypus (a type of midge that lives in cold, clear streams) was found in Houghtaling Creek and has only been recorded in 3 other locations in the state of Minnesota.

Other sensitive, stenothermic insects found in Houghtaling Creek include pollution- intolerant Chimarra, Emphererella, Nigronia and Glossosoma nigrior.

<https://www.pca.state.mn.us/sites/default/files/wq-ws3-04010101b.pdf>

(Doc 79) pg.388

Two Island River meets Exceptional criteria, indicating excellent coldwater habitat and water quality. **It has the presence of a state listed species of special concern , the dragonfly, Boyeria Grafiana.**

Also present are Brook Trout and the stenothermic Slimy Sculpin, capable of surviving only a very narrow range of temperatures. The macroinvertebrate communities included nine stenothermic taxa and several other highly sensitive insects.

Road-stream intersections are extremely concentrated in the Two Island River catchment and some may negatively impact stream function and inhibit ecological connectivity.

Potential barriers have been in the form of poorly functioning road crossings have been documented on Two Island River.

<https://www.pca.state.mn.us/sites/default/files/wq-ws3-04010101b.pdf>

(Doc 77) pg.386

Mantiou River Subwatershed

Aquatic life and recreation indicators for lakes, rivers and streams of the Manitou River subwatershed consistently reflected good water quality. In general, FIBI and MIBI scores were high, and streams were characterized by low levels of sediment, nutrients, and bacteria. In-stream and riparian habitat was excellent; the subwatershed's average MSHA core of 82.3 was the highest across the entire Lake Superior North Watershed. **Three streams met exceptional use biocriteria based on FIBI and MIBI scores: protection strategies should be developed for these and other high-quality aquatic resources found throughout the subwatershed.**

<https://www.pca.state.mn.us/sites/default/files/wq-ws3-04010101b.pdf>,
(Doc 80) pg. 389

Manitou River is an Exceptional MPCA ranked river that would be crossed by the proposed Border to Border Route.

Water quality and biological communities of the Manitou River were monitored downstream of the North Branch and Moose River confluences. An intensive water chemistry monitoring station was established just downstream of the Cramer Road; at this location the river had consistently low concentrations of bacteria, sediment, and nutrients. Biological indicators reflected the excellent water quality and habitat conditions; FIBI and MIBI scores met exceptional use biocriteria.

MPCA biomonitoring crews have monitored this location several times since the late 1990s. Over the years, the fish community has consistently included Brook Trout, Mottled Sculpin, and Longnose Dace. The macroinvertebrate community has included 13 different mayfly genera, and eight different stenothermic insects. Thermal monitoring suggests that the Manitou River at this location is a relatively cold stream compared to others of similar size, making it a unique resource.

<https://www.pca.state.mn.us/sites/default/files/wq-ws3-04010101b.pdf>,
(Doc 81) pg.390

Baptism River Subwatershed

There are 3 streams in the subwatershed that meet Exceptional Use biocriteria. Protection strategies should be developed for these and for other high quality aquatic resources found throughout the subwatershed.

<https://www.pca.state.mn.us/sites/default/files/wq-ws3-04010101b.pdf>

(Doc 82)pg.391

West Branch of Baptism River is an Exceptional MPCA river that would be crossed by the proposed route.

The fish community includes Brook Trout, slimy Sculpin, and Longnose Dace, all of which are sensitive species. The macroinvertebrate community is characterized by a high proportion of sensitive taxa, including six stenothermic insects and **Boyeria grafina**, a state listed species of special concern. A noteworthy macroinvertebrate is the mayfly **Ameletus**, which the MPCA has only found at four other locations

In Minnesota.

<https://www.pca.state.mn.us/sites/default/files/wq-ws3-04010101b.pdf>

(Doc 82)pg. 391

East Branch of the Baptism River is an Exceptional MPCA ranked river that would be crossed by the proposed route.

The fish community is dominated by the pollution intolerant Longnose Dace and also included good numbers of Brook Trout. The macroinvertebrate community is particularly robust, including 62 taxa in a single sample.

Six different stenothermic insects were observed including the **Boyeria grafiania**, a species of state listed special concern.

IT SHOULD BE NOTED : some potential stressors are present along this reach, in the form of a road encroaching upon the stream for a significant portion of it length. Protection strategies for this reach of the East Branch may include working with private land owners to promote riparian land uses that promote cool water temperatures and minimizing inputs of sediment and nutrients.

<https://www.pca.state.mn.us/sites/default/files/wq-ws3-04010101b.pdf>

(Doc 83) pg.392

Summaries and Recommendations from the Lake Superior-North Watershed Monitoring and Assessment Report

<https://www.pca.state.mn.us/sites/default/files/wq-ws3-04010101b.pdf>

(Doc 84)pgs. 393-96

LAKE SUPERIOR, an outstanding international value resource water

As stated, all of the streams crossed by the proposed Border to Border Route in the Lake Superior North Watershed, ultimately flow into Lake Superior itself, which is an MPCA ranked outstanding international resource.

The exceptional characteristics of specific waters designated in Minnesota rules as outstanding, very sensitive, or unique resources — “outstanding resource value waters” or ORVWs (Minn. R. 7050.0335) — must be maintained and protected. Minnesota rules specify two classes of ORVWs: “prohibited” and “restricted”

“All surface waters in the Lake Superior basin are designated as outstanding international resource waters (OIRWs). Antidegradation protections for the Lake Superior basin focus on reducing the contribution of bio-accumulative pollutants to the basin.”

<https://www.pca.state.mn.us/water/water-quality-standards>

(Doc 85) pgs. 397-98

Lake Superior is recognized nationally and internationally as one of the world’s most important fresh water lakes.

Lake Superior has also been identified for protection consideration, as it has experienced some change in trophic status in near shore areas with increasing levels of attached algae and turbidity.

<https://www.pca.state.mn.us/sites/default/files/wq-ws4-51a.pdf>

(Doc 86)pg.400

Due to water quality concerns along the shore of Lake Superior, Cook County SWCD began sampling Lake Superior near shore sites in 2014. Sediment plumes had been observed in the lake at tributary inputs, in addition to increased levels of algae.

<https://www.pca.state.mn.us/sites/default/files/wq-ws4-51a.pdf>, (Doc 87)pg.401



[University of Wisconsin Cooperative Institute for Meteorological Satellite Studies](#)

A satellite image from June 18, 2018 shows plumes of sediment flowing into the south shore of Lake Superior following heavy rains over June 15-17.

The Outsize Impact Small Streams have On Lake Superior

*Plumes Fed by Minor Tributaries Affect Ecology of the Great Lakes,
Great Lakes Echo , 12/27/2018*

<https://www.wiscontext.org/outsized-impact-small-streams-have-lake-superior>
(Doc 88) pgs.402-406

This study counted approximately 2,800 tributaries that empty into Lake Superior.

“ That was a significantly bigger number than anyone else had calculated before and really helped to emphasize the potential importance of streams as contributors to the Lake Superior ecosystem,” said Colin Brooks, co-author of the study and manager of the Environmental Science Laboratory at the

Michigan Tech Research Institute in Ann Arbor, Michigan.

Stream outputs into Lake Superior don’t get mixed in immediately. Instead, they form plumes, which lead researcher and ecosystem ecologist at the Michigan

Technological University, Amy Marcelli, described as “ mini water bodies” that are slowly mixed into the lake. Most of the time they are fairly small. “But sometimes, the plumes are very big, particularly after snow melts or big storms,”

Marcelli said.

These plumes are visible because the water coming out of the tributaries is quite different than the water in the lake.

“It’s important to realize that plumes are part of the natural lake dynamic”, Marcelli said. “They contain nutrients delivered into the lake, which fuel the productivity of algae, which feed the zooplankton, which feed the little fish,

which feed the bigger fish. But human activity modifies the amount of nutrients in the plumes, which can lead to negative effects,” she said.

“Large summer rain storms appear to be connected to cyanobacterial blooms,” Marcelli said.

“ When those storms happen, they cause a lot of erosion in the watersheds,” she said. When they do, the plumes tend to have a lot of sediment with phosphorous bound to it, which researchers think can then lead to these cyanobacterial blooms.”

WILD RICE LAKES

The Minnesota Board of Water and Soil Resources is working in conjunction with the DNR on putting in place protections for sensitive Wild Rice Lakes for current and future generations to enjoy.

Four of the Counties on the proposed route are part of a small list of counties where wild rice lakes remain in the state.

Wild rice provides important ecological benefits. Wild rice shoreland encompasses a complex of shallow lakes, rivers, and shallow bays of deeper lakes that support rice and provide some of the most important habitat for wetland-dependent wildlife species in Minnesota. Wild rice also improves and protects water quality by keeping soil and nutrients in place and acting as a buffer to slow winds across wetlands.

https://bwsr.state.mn.us/sites/default/files/2018-12/Protecting%20Minnesota%27s%20Wild%20Rice%20Lakes_0.pdf (Doc 88A)pg. 407

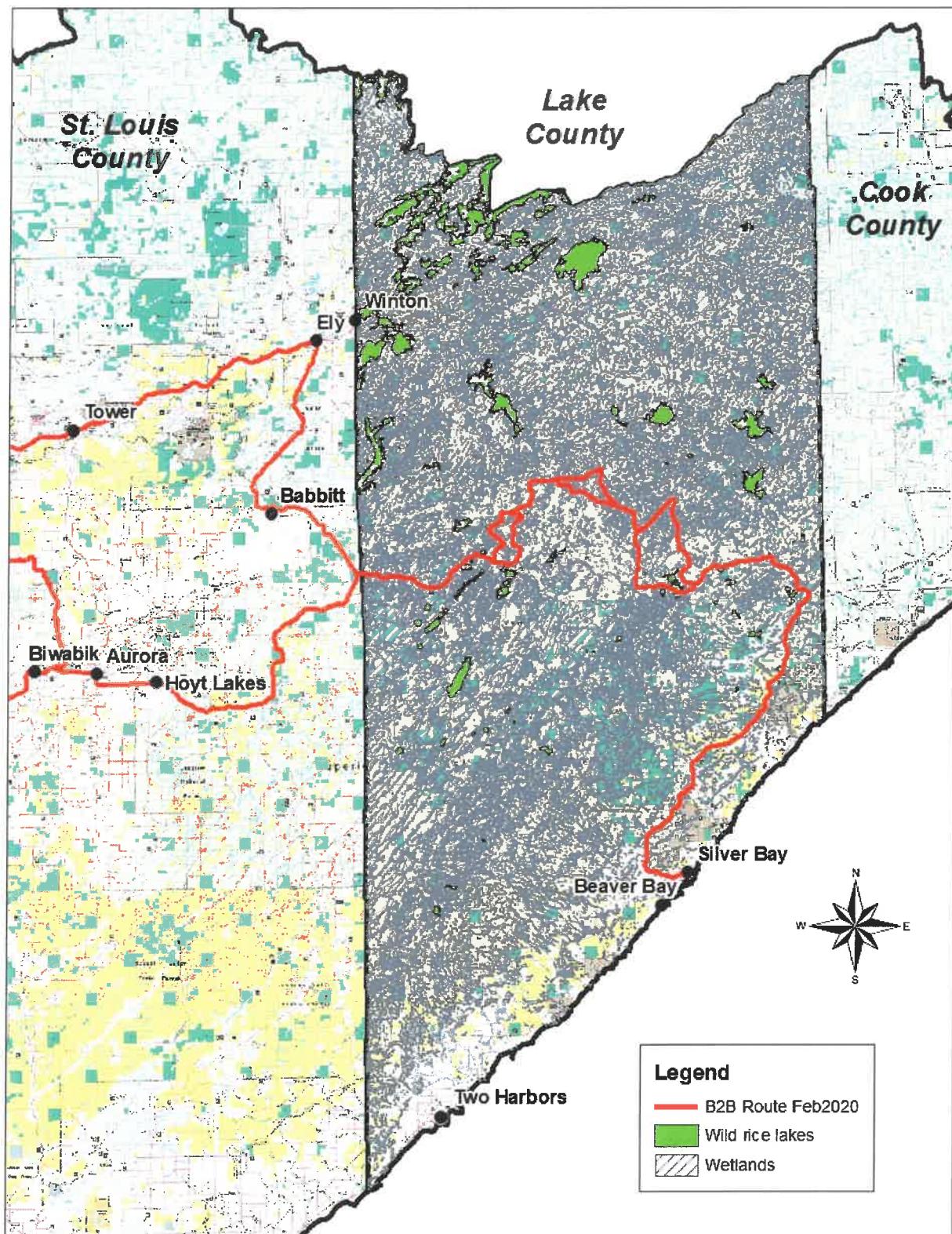
Another special feature present throughout the wetlands in the Rainy River watershed is the presence of wild rice. Analysis of a recent compilation of waters known to support wild rice finds 170 locations where wild Rice grows in the Rainy-River-Headwaters Watershed, the majority of these locations are lakes, however 18 locations are emergent or shallow water wetlands. (Rainy River Watershed Report, June 2017

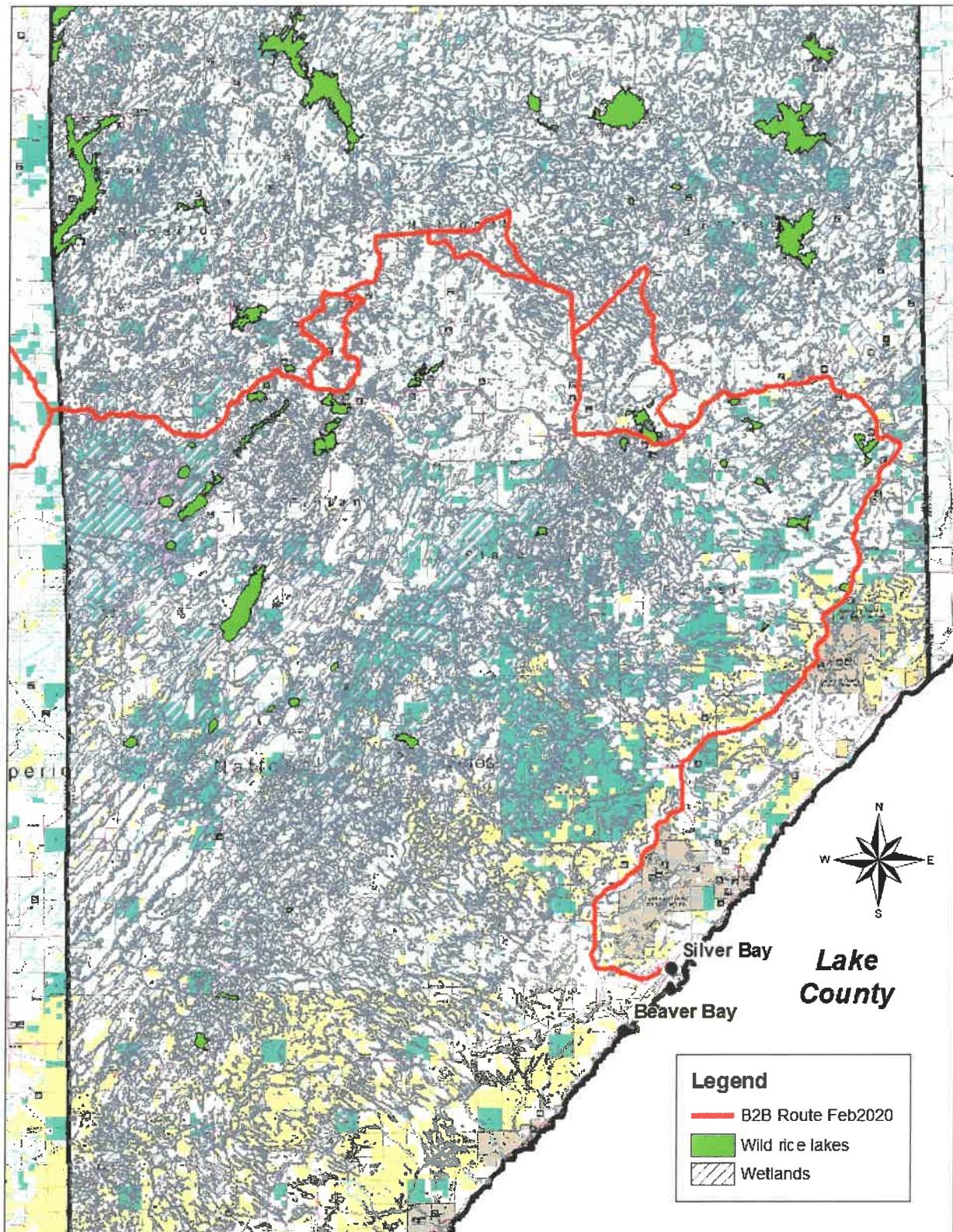
<https://www.pca.state.mn.us/sites/default/files/wq-ws3-09030001b.pdf>
(Doc 68)pg.377

CONCLUSION:

Lake County, as an example, has 50 Wild Rice lakes. As seen in the map below, the proposed route in Lake County would travel very near to a number of wild rice lakes that could risk erosion and sedimentation pollution from an increase in highway licensed OHV traffic from a nationally advertised, designated route.

https://bwsr.state.mn.us/sites/default/files/2018-12/Protecting%20Minnesota%27s%20Wild%20Rice%20Lakes_0.pdf (Doc 88 A) pg. 407





The Minnesota Board of Water and Soil Resources (BWSR) has received Outdoor Heritage Funds to support and protect our state grain. Working in cooperation with the DNR and soil and water conservation districts, BWSR will complete 46 easement projects on 29 lakes and rivers. Funding for wild rice protection began in 2012. This first phase of the project was awarded \$1.89 million which yielded 18 completed projects extending permanent protection to almost 10 miles of wild rice shoreland. Phase II began in 2013 and is still underway. Working together with the Department of Natural Resources and Soil and Water Conservation Districts (SWCDs), the program has prioritized the list of wild rice lakes for protection efforts and is working on outreach with landowners to fully allocate \$1.63 million in funds.

Over 25 easement applications are in the pipeline to provide permanent protection for these valuable lakes.

This program is expected to continue in the coming years with \$2.66 million in funding available for phases three and four of the program. In addition to continuing to promote easements and permanent land protection, BWSR and SWCDs will hold more local wild rice lake prioritization sessions to focus protection on the most significant wild rice resources.

Overall, these efforts have resulted in protection over 20 miles of wild rice shoreland. "Wild rice, and the lakes that support it, are an important part of Minnesota's cultural livelihood and ecological health," Board Conservation Dan Steward said, "and we're pleased with the work we've been able to do so far to protect this resource for future generations. We will continue to partner with state and local agencies to make sure wild rice shoreland continues to be a healthy, thriving part of the landscape.

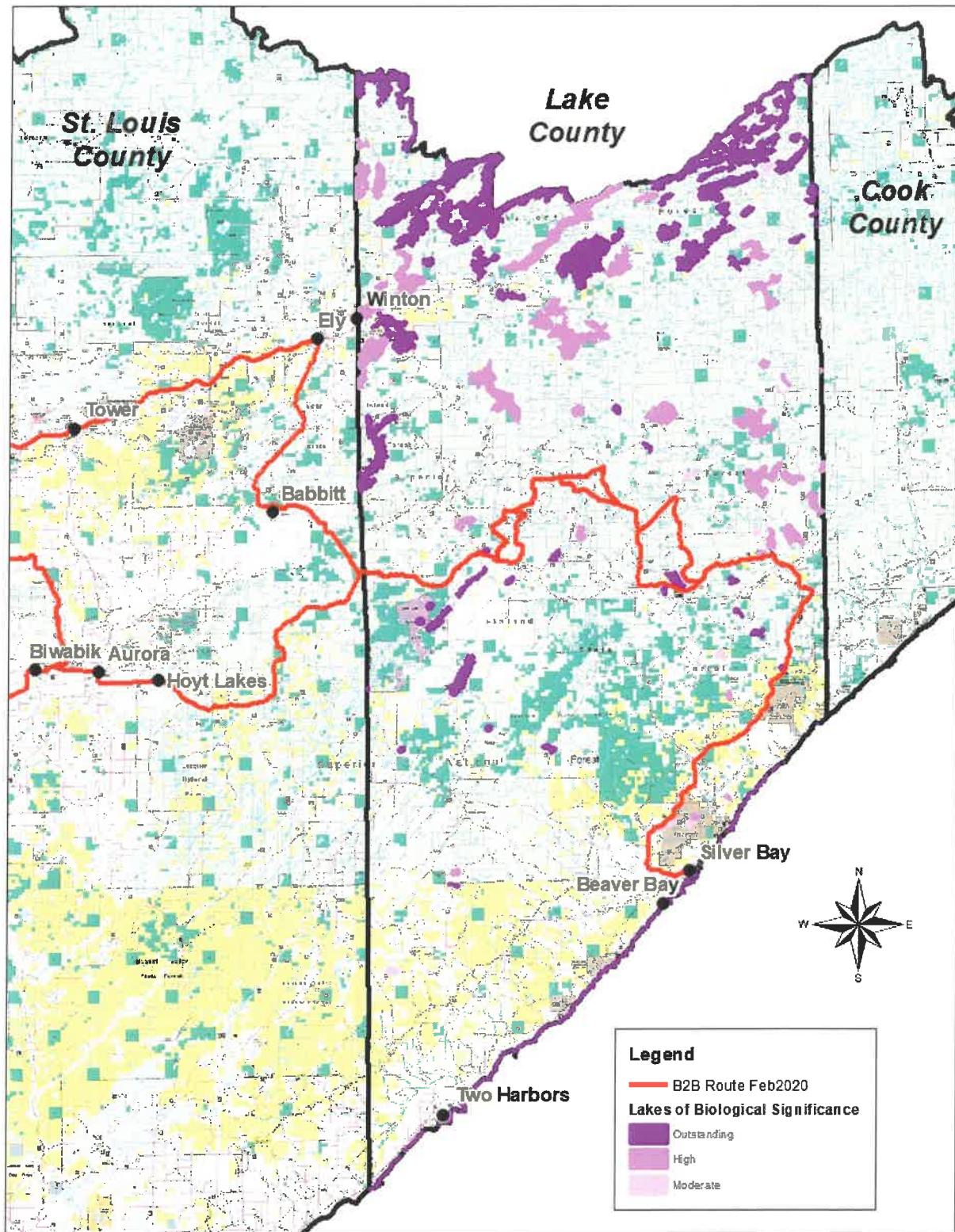
https://bwsr.state.mn.us/sites/default/files/2018-12/Protecting%20Minnesota%27s%20Wild%20Rice%20Lakes_0.pdf (Doc 88 A) pg.407

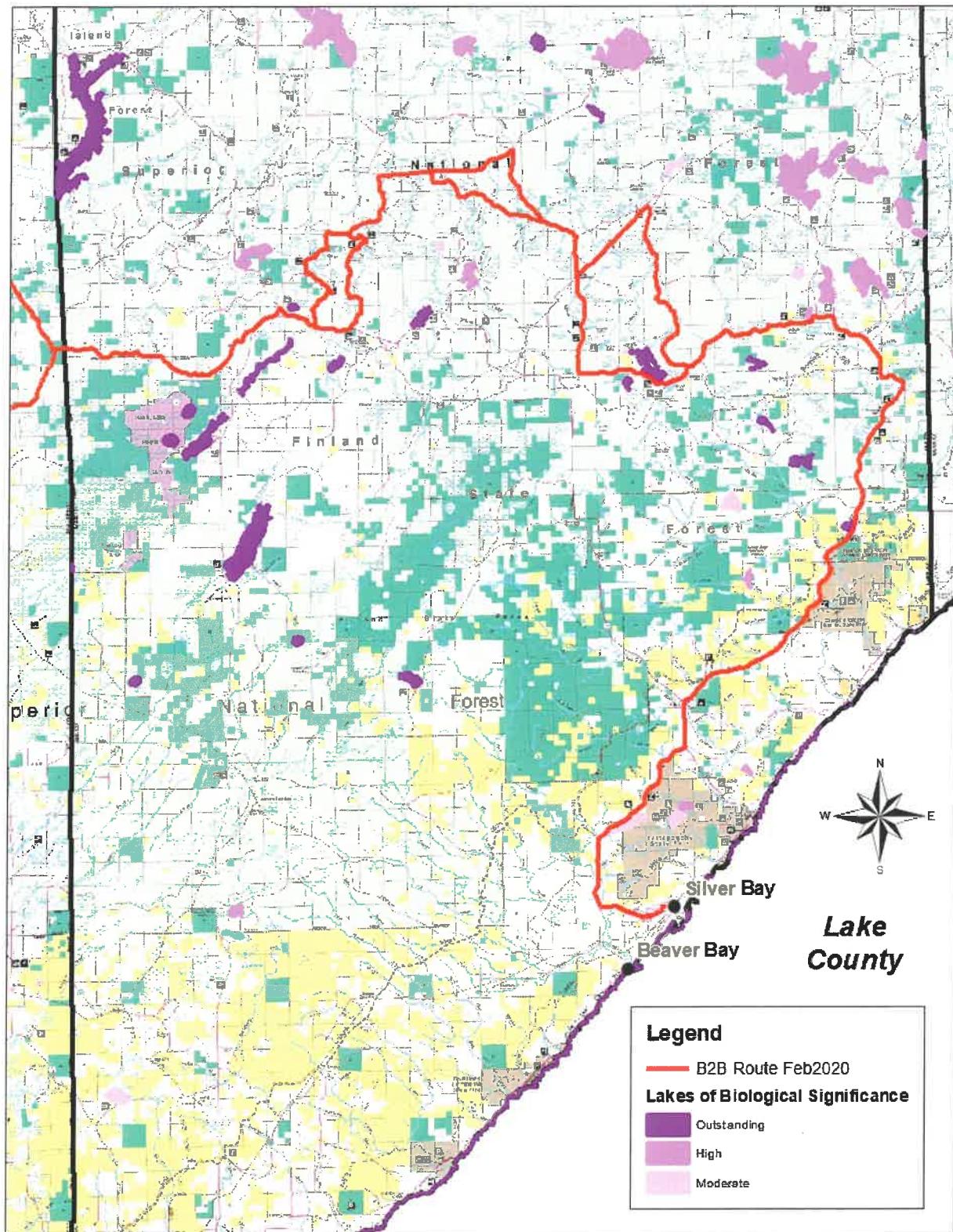
LAKES OF OUTSTANDING BIOLOGICAL SIGNIFICANCE

The proposed route in Lake County would travel by a number of lakes of outstanding biological significance, as can be seen in the maps on the following pages. These lakes have the best occurrences of the rarest of species and the most outstanding examples of the rarest of plant communities.

Increased highway license OHV traffic from a designated, nationally advertised route, has the potential to degrade these outstanding resources with erosion, runoff and sedimentation pollution, as well as fugitive dust pollution to these lakes.

To protect and prevent against water degradation, a 300 foot buffer zone of Best Management Practices should be in place for these proposed roads running alongside lakes of outstanding biodiversity along the entire proposed route.





ROADS: Road Types, Funding, Maintenance Levels, Closures, Erosion, Sediment Run Off Issues and Environmental Sustainability

Maintenance Funding:

The appropriations bill passed in 2019 for the \$200,000 in funds available until 2023, states for a county or township to be eligible for reimbursement, "the claimant must demonstrate that the needs resulted from additional traffic generated by the border-to-border touring route.". Also the increased use must be attributable to a border-to-border touring route that has caused at least a 50 percent increase in the maintenance cost for roads under the claimant's jurisdiction, based on a 10-year maintenance average.

(Doc 15)pg. 254

David Hann, the Executive Director of the Minnesota Association of Townships has stated that the \$200,000.- for road repair reimbursement for the proposed 764 mile route is insufficient and the terms for reimbursement almost impossible to meet.

Clearwater County also opposed the route with an Official Resolution of Opposition for multiple reasons, one of them being road maintenance reimbursement. (Doc 13) pg. 248 Red Lake County also opposed the proposed route, in part, out of maintenance concerns. and like Clearwater County, was subsequently dropped from the route.

The Executive Director of the Minnesota Association of Townships, David Hann, was quoted in a 9/1/2019 Cook County News Herald article on the proposed route's maintenance funds and terms.

As to the ability of townships to receive aid to repair roads damaged by vehicles used on the B2B route under the state's new legislation, Hann said the state didn't ask for input from the townships about a plan for reimbursement for repairs, "Which was ridiculous. Townships don't have the ability to track a baseline over many years, this is unworkable. For a township to try to keep track of off-road vehicle use on their roads is crazy. Who's going to pay for the maintenance and repair of those roads?

The townships, that's who," he said, adding, "One township just repaired five miles of road at a cost of \$35,000. How far will that \$200,000 go?

The next step for the Minnesota Association of Townships, said Hann is, "to try to meet with the commissioner and see if we can slow this thing down or stop it all together."

(Doc 14)pgs. 251-53

The Grand Portage Reservation also had concerns about the proposed route and the impact of increased, high level traffic on their roads and the impact on tribal members being able to exercise their hunting, fishing and gathering rights.

----- Forwarded message -----

From: **Susan Perrin Schubert** <susanpschubert@gmail.com>

Date: Sun, Dec 2, 2018 at 1:41 AM

Subject: Response from Seth Moore/ Biologist Grand Portage Reservation

To: Susan Perrin Schubert <susanpschubert@gmail.com>

Hi Susan,

Our views on the B2B have basically been to ask that the Grand Portage Reservation not be included in the B2B trail system. The reservation land-base is tribally owned and is not part of the public domain. We too are concerned about high levels of additional traffic on our forest roads and how that might impact tribal members exercising their rights to hunt, fish, and gather for subsistence or cultural purposes. Our view would render the B2B trail system a B2AlmostB because the trail would end in Hovland rather than transecting the reservation and reaching the border. We have not developed a formal response yet, but have had a few consultations with Federal and state leadership familiar with the initiative.

Seth

Seth Moore, PhD
Director of Biology and Environment Grand Portage Band of Chippewa
27 Store Rd., Grand Portage, MN 55605
PH. 218-475-2022 Cell: 218-370-9310 FAX: 218-475-2615
samoore@boreal.org

Roads within the Superior National Forest

Within the Lake Superior North Watershed and Rainy River Watershed portion of the route, there are 88.7 miles of USFS roads in the Superior National Forest.

USFS road maintenance funding for the Superior National Forest has decreased over 60% since 2000 without a similar decrease in total road mileage.

In 2015 the **SNF Forest-wide Roads Study Report, (Travel Analysis Report)**, stated:

“At the current level, we are not able to properly maintain the road system.” This funding situation has not improved.

The report continued:

At the current funding level, roads cannot be maintained to standard and the Forest is not able to meet the Forest Plan Desired Conditions of providing safe traveling conditions for the public and providing reasonable access to private land and other public lands. The Forest recognizes that the trend of decreasing funding will most likely continue.

https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd526559.pdf,

(Doc 89) pg. 408

In the Forest-Wide Roads Study report 2015, it was stated that based on a model developed by the Region 9 Regional Office, the total estimated funding needed to maintain the 2500 mile road system is approximately \$2,000,000 per year for basic road maintenance.” This equates to \$800.- per annum per mile.

The proposed route would travel approximately 88.7 miles on SNF roads, and would require according to the 2015 Forest-Wide Road Study report, \$70,960.- per year for *solely* basic road maintenance.

The 2015 study went on to state:

Additional funds are needed for bridge replacement and replacement of surfacing on maintenance level 3-5 roads. We currently have a backlog of approximately \$15,000,000 for surfacing replacement. The past few years we have been receiving \$500,000 to \$600,000, approximately 30% of the amount needed. The analysis completed for this TAP did not result in identifying a significant number of roads or miles that are likely not needed in the future.

[https://www.fs.usda.gov/Internet/FSE DOCUMENTS/fseprd526559.pdf](https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd526559.pdf)

(Doc 89) pg. 408

CONCLUSION

The B2B project proposer has neither assessed nor identified sufficient funding to cover repairs and maintenance costs from the use of this route and future related routes and challenge loops. The burden of estimating, projecting and sourcing adequate, long term guaranteed funds for this new recreational use should be placed upon the proposer before the route is put to use.

Further, If the USFS cannot properly maintain its current road system on which locals, workers and a variety of users depend to navigate an area, providing reasonable access to private and other public lands, logically it could not handle the additional maintenance load required for a nationally advertised, designated, signed and mapped route for Off Highway vehicles using USFS roads for purely recreational purposes.

It is not in the overall general public interest to prioritize maintenance of these roads for the recreational use of highway licensed Off Road Vehicles over maintaining the USFS roads used by the general public to access their properties, stores and places of business.

TO DATE- no maintenance terms between the DNR and the Superior National Forest have been made public to taxpayers.

Objectives for Road Maintenance

Forest-Wide Travel Management Project

https://www.fs.usda.gov/nfs/11558/www/nepa/38755_FSPLT1_024887.pdf

(Chapter 4, pg. 3)

“Each Forest system road is to be maintained to a level commensurate with the planned function and use of the road. The intended level of maintenance to be received by each road is termed the Objective Maintenance Level (OML). OMLs are divided into five levels of maintenance intensity, with the levels numbered from 1 through 5. OML 1 designating the lowest level of maintenance, and OML 5 designating the highest level of maintenance.

The Objective Maintenance Levels are defined in Table F-1 on the following page.

Table F-1. Objective Maintenance Level Definitions for Forest System Roads (FSM 7709-58)

OML 1	Basic custodial care (closed)	Assigned to intermittent service roads when they are closed to street legal motorized vehicular traffic. The closure period must exceed one year. Roads receiving OML 1 maintenance would generally be managed at OML 2 during the time they are open for traffic. Basic custodial maintenance is performed to keep damage to adjacent resources to an acceptable level and to perpetuate the road to facilitate future management activities. Emphasis is normally given to maintaining drainage facilities and runoff patterns.
OML 2	High clearance vehicles	Assigned to roads operated for use by high clearance vehicles. Passenger car traffic is not a consideration. Traffic is normally minor, usually consisting of one or a combination of administrative, permitted (such as log haul), dispersed recreation, or other specialized uses. Log haul may occur at this level.
OML 3	Suitable for passenger cars.	Assigned to roads open and maintained for travel by a prudent driver in a passenger car. User comfort and convenience are not considered priorities. Roads are typically low speed, single lane with turnouts and have only spot surfacing.
OML 4	Moderate degree of user comfort	Assigned to roads that provide a moderate degree of user comfort and convenience at moderate travel speeds. Most roads are double lane and aggregate surfaced.
OML 5	High degree of user comfort	Assigned to roads that provide a high degree of user comfort and convenience. These roads are normally double lane, and may be aggregate surfaced or paved facilities.

Forest-Wide Travel Management Project

https://www.fs.usda.gov/nfs/11558/www/nepa/38755_FSPLT1_024887.pdf

(Chapter 4, pg. 3)

Road type overview of the Proposed Border Route in the Superior National Forest

An analysis of mileage and the classification of Operational Level Maintenance roads and stream crossings proposed for the Border to Border Route within the **Superior National Forest (SNF)**, provides the following information.

OML 2 roads (Low standard single lane U.S. Forestry Service (F.S.) roads, unmaintained):

1. F.S. 112 / Dunka River Rd. (10.2 miles).
2. F.S. 1491 / Deep Lake Rd. (6.1 miles).
3. F.S. 386 / Kelly Loop Rd. (4.4 miles).
4. F.S. 173 / Thorsen Rd. (5.9 miles).
5. F.S. 380 (3.3 miles)
6. F.S. 174 / Dumbell Road 8.8 miles

Total miles of OML 2 low standard single lane roads on the proposed Route: 38.7 miles.

OML 3 roads (Single lane U.S. Forestry Service (F.S.) roads with only spot surfacing):

1. F.S. 383 / Bandana Lake Rd. (5.2 miles)

Total miles of OML 3 single lane roads on the proposed Route: 5.2 miles.

OML 4 (Double lane and aggregate surfaced U.S. Forestry Service (F.S.) roads):

1. F.S. 377 / Tomahawk Rd. (5.9 miles).
2. F.S. 373 / Northwest Rd. (5.4 miles).
3. F.S. 369 / Sawbill Landing Rd. (5.8 miles).
4. F.S. 172 / Wanless Rd. (11.9 miles).

Total miles of OML 4 double lane roads on the proposed Route: 29 miles.

Lake County county roads:

1. Lake County 2 / F.S. 15 (1.6 Miles).
1. Lake County 7 / Cramer Rd. (23.6 miles).
2. Lax Lake Rd. / 402 / Lake County 31. (8.7 miles).
3. Lake County 5 / 11 (3.4 miles).

Total miles of Lake County county roads on the proposed Route:

37. 3miles.

Minnesota Hwy 1:

1. From Lake County 2 to F.S. 383 / Bandana Lake Rd. (3.4 miles).
2. From Lake County 7 / Cramer Rd. to Lax Lake Rd. / 402 / Lake County 31 (1.9 miles)

Total miles of Minnesota Hwy 1 on the proposed Route: 5.3 miles.

Total miles in Lake County of all roads on the proposed Route: 115. 5 miles.

Total Miles of roads in the Superior National Forest portion of Lake County on the proposed Route: 88.7 miles.

(Map of the Superior National Forest 2018)

(Objective Maintenance Levels (OML) for Superior National Forest Roads, Forest-Wide Travel Management Project)

https://www.fs.usda.gov/nfs/11558/www/nepa/38755_FSPLT1_02488_7.pdf,

pg. 3 pdf report

Superior National Forest Road Definitions

Forest system roads are classified roads under Forest Service jurisdiction that the national forests plan to maintain for long-term use (permanent). These roads are given road management objectives, and have road maintenance commensurate with their intended use and function. They may be closed either seasonally or for longer periods of time when no land management activities are in progress. The Superior NF further defines Forest system roads and their intended purpose and use.

The proposed Border to Border in the SNF uses 38.7 miles of OML 2

Roads. These primitive roads are single lane, unmaintained roads that are classified as minor traffic, usually consisting of one or a combination of administrative, permitted,

(such as log haul) dispersed recreational traffic, high clearance vehicles. Log haul may occur at this level. These roads have no erosion control or drainage measures.

The following Guidelines for Road Maintenance Levels, United States Department of Agriculture, Forest Service provides additional important descriptors about OML 2 roads as it pertains to road construction and road closings:

"Maintenance level 2 roads have the following attributes:

- Are maintained for use by high-clearance vehicles and not suitable for passenger cars.
- Do not consider passenger car traffic, user comfort, and user convenience.

• **Have low traffic volume and low speed.**

• Typically, are local roads that connect to collectors and other local roads.

• Have dips or cross drains as the preferred drainage treatments.

• Avoid the use of culverts, arches, and bridges when possible.

• Typically, have very few, if any, signs or other traffic control devices.

- Are subject to the requirements of EM-7100-15 and MUTCD for all signs.

- Do not consider surface smoothness.

• Do not always provide motorists with alerts to potential hazards.

May not be passable during periods of inclement weather.

- **Summer Seasonal roads** are constructed for dry weather use, and are normally constructed of native or pit run borrow material. **In addition to normal spring load restrictions, these roads are normally closed to use during unseasonably wet weather periods. These are typically Objective Maintenance Level 1 and 2 roads.**

Forest-wide Travel Management Project-

https://www.fs.usda.gov/nfs/11558/www/nepa/38755_FSPLT1_024887.pdf,

(Doc 90) pg.409

Maintenance level 2 prescription guidelines include:**Shoulder**

Shoulder is usually not defined and maintenance is not required unless necessary to maintain structural integrity of the roadway, drainage functionality, or access by high-clearance vehicles.

Drainage

Drain as necessary to keep drainage facilities functional and prevent unacceptable environmental damage while maintaining passage for high-clearance vehicles.

Structure

Maintain all structures to provide for the passage of high-clearance vehicles and to protect natural resources.

https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprd3793545.pdf

(Doc 91) pgs.410-12

Maintenance ON OML 2 Mostly Eliminated

"The Forest has mostly eliminated expenditure of road maintenance funds on ML 2 roads and the reduced amount of funding is focused on higher traveled ML 3, ML 4, ML roads".

https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd526559.pdf

(Doc 92) pg. 413

The United States Department of Agriculture, Forest Service, Eastern Region, acknowledges the environmental impacts of OML 3,4, and 5 roads have less impact than OML 2 rated roads.

March 30, 2009 RE: Appeal of the Decision Notice and Finding of No Significant Impact for the Forest-Wide Travel Management Project Environmental Assessment, Superior National Forest, Appeal # 09-09-09-0029 A215

"More generally, the Forest Service's reasoning in support of the FONSI is fundamentally flawed...It follows from this increased demand that even with fewer road miles open to OHV use near the Boundary Waters, OHV use will continue to rise. Also, illegal use of roads recently closed to OHV use will undoubtedly continue." (NOA, p. 6).

Response: While the analysis does acknowledge that OHV use may increase in the near future, the DN (p. 17) states that most of the increased use will be focused on existing OML (Operational Maintenance Level) 3, 4 and 5 roads (DN, p. 17).

These roads are built to a higher standard thus having fewer impacts based on road design.

OML 2 Road Design, Maintenance issues and Environmental Impact Risks

A two-way, nationally advertised, promoted, designated route for highway licensed vehicles that is mapped and signed, that uses OML 2 roads and adds no increase in staff to monitor and close roads as needed, risks the potential for significant environmental impacts due to the following criteria that would be in conflict with the proposed Border to Border Adventure Touring Route.

OML 2 Roads are:

- Classified for minor traffic and dispersed recreational traffic
- Shoulders are undefined and there are no erosion or drainage control measures.
- Constructed for dry weather and summer seasonal use
- Maintenance and closure oversight for wet weather eliminated for OML 2 roads due to lack of resources

Due to an increase in OHV traffic for a nationally advertised, designated, signed and mapped two-way directional route on single lane OML 2 roads, that are classified for dispersed recreation and minor traffic and local connector traffic, the route risks the potential to significantly increase the incidence of two full size vehicles having to pass one another on the route. To do this, both vehicles would have to go off road, on undefined shoulders, to pass one another.

This forced manoeuver to go off road to pass another vehicle would:

- Destroy vegetation
- Braid the road
- Significantly increase the risk of sedimentation and fugitive dust pollution at stream crossings
- Increase the risk of vehicles picking up, shedding and spreading invasive species seed
- Damage and decrease stream and riparian area buffers

Due to no funds for closure or maintenance oversight on OML 2 roads, there is the potential for a significant increase in road rutting, during unseasonably wet seasons or sudden, severe rain events, leading to road conditions and travel on these roads resulting in elevated environmental harm to streams and riparian areas.

Due to Climate Change with more frequent and extreme rainfall, increased high impact traffic on unmaintained, primitive OML 2 roads, risks severe rutting and gully development with more frequent and extreme rainfall, combined with lack of closure oversight for unmaintained OML 2 roads.

Plumes Fed by Minor tributaries Affect Ecology of the Great Lakes,

Great Lakes Echo , (Doc 88) pgs. 402-06

<https://www.wiscontext.org/outsized-impact-small-streams-have-lake-superior>

Due to limited drainage measures and the unraised road bed design of single lane OML 2 roads, even during normal summer weather there are frequent pools of standing water across the entire road and cases where streams are flowing across the road. An increase in traffic on OML 2 roads with a designated OHV route has the significant potential when crossing these pools of water and streams that flow across roads to:

- significantly increase road rutting
- significantly increase sedimentation to waters
- significantly increase fugitive dust pollution to waters
- significantly increase the contamination of waters with invasive species

Failed culverts and washouts on OML2 roads risk the significant potential for these same environmental impacts listed immediately above.

Nationally advertising a designated route for highway licensed OHV traffic risks significant potential for traffic resulting in vehicle caravans and packs, as recognized by the US Fish and Wildlife service.

OML2 roads are classified for dispersed recreation.

(US Fish and Wildlife Service letter to DNR dated March 6, 2017) (Doc 6)pg.231

A designated route promoted by the MN DNR, NOHVCC and also by 4 Wheel Drive clubs risks concentrating vehicles in large numbers on OML 2 roads classified for *dispersed* recreation, exacerbating road rutting and stream sedimentation.

One example of large group caravans and packs is the popular is Jeep Jamboree USA events:

Jeep Jamboree.com,

<https://jeepjamboreeusa.com/tripsregister/>



24TH NORTHWOODS – MOLE LAKE 2019

Crandon, Wisconsin

JULY18-20

TRIP DETAILS

3-7 Trail Rating (/trail-ratings) Classic Jamboree (/faq/#classic) Event Itinerary

(<https://jeepjamboreeusa.com/pdfs/northwoods-mole-lake-2019.pdf>) Facebook Group

(<https://www.facebook.com/groups/jjusa.northwoods.mole.lake/>) Photos

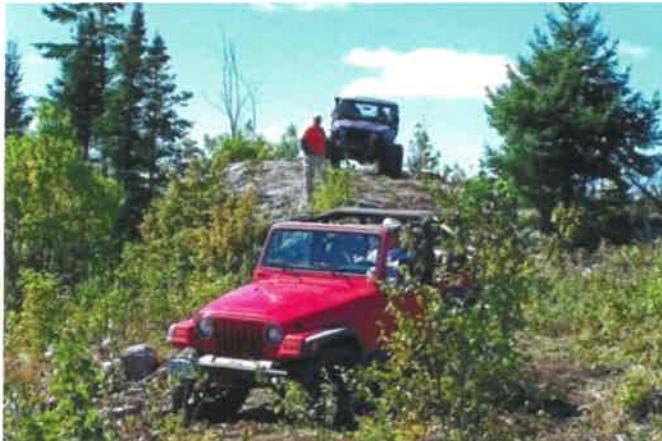
(<https://www.facebook.com/media/set/?set=a.471749328764.250754.143647533764>)

FAQ (/faq/)

Venture through heavily forested trails, passing creeks, ponds, and lakes that dot this northern backcountry. Discovered in 1634 by French explorer Jean Nicolet, the 661,000-acre

Nicolet National Forest surrounds the Sokaogon/Chippewa community of Mole Lake. You'll go deep into beautiful forest on old logging roads and abandoned railroads.

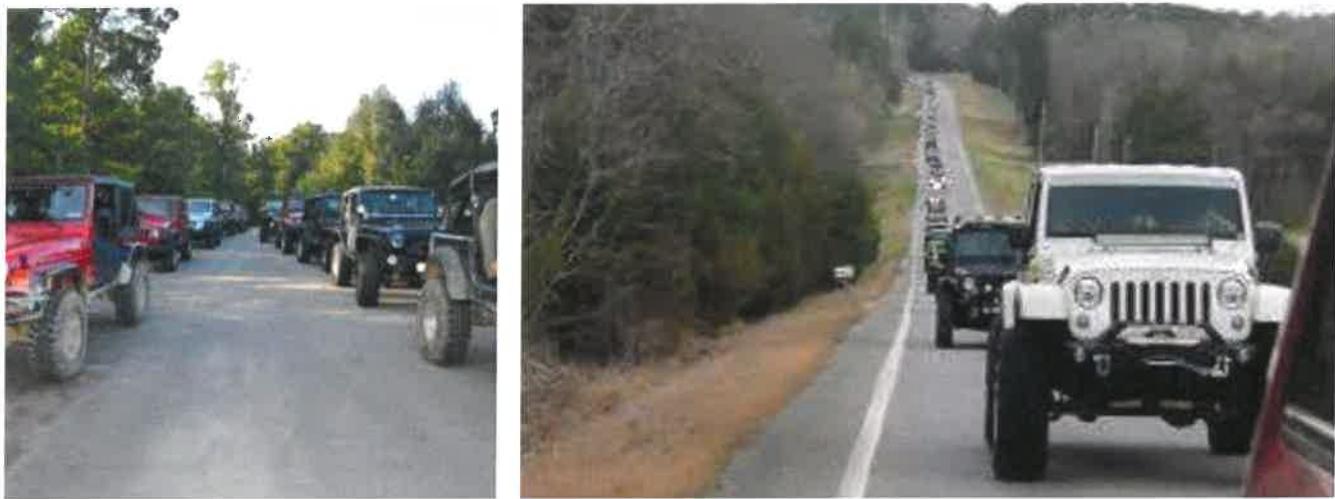
Skirt the headwater swamps of the Peshtigo, Wolf, and Wisconsin Rivers. Keep an eye out for plenty of indigenous wildlife, including deer, beaver, bald eagles, loons, foxes, and black bear. The region is also a paradise for paddlers and fishers alike. Come explore the northwoods with us in this land of lakes





Other examples of the popular caravan events:





OML 3, 4 and 5 Road types

OML 3 roads are single lane roads with only spot surfacing and some turn outs.

Therefore, the use of OML 3 roads for the proposed designated route that risks substantially increasing traffic of a two-way directional route on a single lane road, risks the same significant potential for environmental impacts posed by an OML 2 single lane classified route when two oncoming vehicles must pass one another.

This forced manoeuvre to go off road to pass another vehicle would:

- Destroy vegetation
- Braid the road
- Significantly increase the risk of sedimentation and fugitive dust pollution at stream crossings
- Increase the risk of vehicles picking up and spreading invasive species seed

Although OML 3, 4 and 5 roads have fewer environmental impacts than OML 2 roads, according to the USDA Forest Service, the SNF states in its 2000 Forest Wide Study Report, that all roads cannot be maintained to standard, increasing the risk of environmental damage for all OML 3,4, and 5 roads on the route, in addition to the OML 2 roads on the proposed route.

At the current funding level, roads cannot be maintained to standard and the Forest is not able to meet the Forest Plan Desired Conditions of providing safe traveling conditions for the public and providing reasonable access to private land and other public lands. The Forest recognizes that the trend of decreasing funding will most likely continue.

SNF Forest-wide Roads Study Report, 2015 (Travel Analysis Report)

[https://www.fs.usda.gov/Internet/FSE DOCUMENTS/fseprd526559.pdf](https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd526559.pdf)

(Doc 89) pg. 408

Trespass and Violation of route closures

Another issue with significant potential to affect road maintenance, safety and environmental damage is the fact that OHV users acknowledge they stray from the route. As noted on the website Thrillcraft: The Environmental Consequences of Motorized Recreation: "A major problem endemic with the thrillcraft culture is the notion that one straddles these machines to go where " no one else has gone." As a consequence, there is a strong tendency to ignore trail and road closures, and violate any limitations placed upon the use of the machines.

For instance, a study in Georgia documented that of the 59 routes surveyed, in the Chattahoochee National Forest, illegal ORV use occurred o 67%, including designated wilderness and trails restricted to pedestrians.

Another study conducted in Colorado on behalf of the Colorado Coalition for Responsible ORV Riding found that despite the fact that most thrillcraft enthusiasts understood that they should not stray from the designated trails, more that 2/3s admitted they go off the trail occasionally and 15-20% admitted they regularly rode off legal routes."

<https://www.stopthrillcraft.org/culture.htm> (Doc 93) pg. 414-15

"In 2003, Forest Service Chief Dale Bosworth declared that " unmanaged recreation" was one of the top four threats to the integrity of national forests.

CLIMATE CHANGE

ROAD CONDITIONS

Of the 30 risks facing the world by both impact and likelihood, climate change related risks topped the list compiled by the World Economic Forum from 1,000 business, policy and thought leaders. The WEF which hosts the Davos, Switzerland meeting and has taken the poll for the last 14 years, reported that the climate change concerns have led the list for the past three years.

Wall Street Journal, 1/17/2019, pg. A2. (Doc 94) pg.416

The report on Precipitation and Climate Change in Minnesota indicates the increasing frequency of "large runoff events:

"Heavy rains are now more common in Minnesota and more intense than at any time on record. Long-term observation sites have seen dramatic increases in 1-inch rains, 3-inch rains, and the size of the heaviest rainfall of the year."

https://www.dnr.state.mn.us/climate/climate_change_info/climate-trends.html

(Doc 95)pg. 417

The Minnesota Department of Natural Resources Website provides the following information on future precipitation and climate trends for Minnesota:

Minnesota has warmed by 2.9F between 1895 and 2017, while getting an average of 3.4 inches wetter. While Minnesota has gotten warmer and wetter since 1895, the most dramatic changes have come in the past several decades.

Compared to 20th century averages, all but two years since 1970 have been some combination of warm and wet, and each of the top 10 combined warmest and wettest years on record occurred between 1998 and 2017. Although climate conditions will vary from year to year, these increases are expected to continue through the 21st century.

Since 2000, Minnesota has seen a significant uptick in devastating, large-area extreme rainstorms as well. Rains that historically would have been in the 98th percentile annually (the largest 2%) have become more common. Climate projections indicate these big rains will continue increasing into the future.

https://www.dnr.state.mn.us/climate/climate_change_info/climate-trends.html

FIGURE VII-1: HISTORIC MEGA-RAIN EVENTS 1866 - 2012 FIGURE

VII-1: HISTORIC MEGA-RAIN EVENTS 1866-2012



Source: Pete Boulay, DNR Climatologist, Minnesota Climatology Working Group.
MINNESOTA CLIMATE CHANGE VULNERABILITY ASSESSMENT 2014, pg. 47

<https://www.health.state.mn.us/communities/environment/climate/docs/mnclimvulnreport.pdf>

Implications of the above study for potential negative environmental impact from the proposed Border to Border Route:

As indicated in several of the above studies, precipitation is a natural environmental factor that combines with all of the other anthropogenic environmental factors (type of road construction, road stream connectivity, and traffic levels) to result in increased levels of stream sedimentation.

The increased negative environmental effects of lower construction standard roads such as OML 2 and OML 3 level roads, combined with higher precipitation levels would have the significant potential to substantially increase the levels of sediments entering adjoining streams and riparian areas. These roads tend to be at the same elevation as the surrounding terrain and therefore prone to flooding low wet spots and increased rutting.

However, during extreme rain events, ANY OML level road that is unpaved and crosses waters with insufficient buffer zones, puts waters at risk for significantly increase sediment runoff pollution and degradation.

Minnesota seasonal weather variability with sudden heavy rainfalls, combined with the potential for a significant increase in traffic due to a designated, nationally advertised route, would have significant potential to increase erosion and transfer of sediment to waters along the route and at stream crossings.

Though rainfall can vary in intensity and time of year, rainfall totals in the northeast region display no significant trend over the last 20 years. **However, precipitation in northeast Minnesota exhibits a significant rising trend over the past 100 years (p=0.001). This is a strong trend and matches similar trends throughout Minnesota.)"**
<https://www.pca.state.mn.us/sites/default/files/wq-ws3-04010101b.pdf>

pg. 23 (Doc 96)pg. 418

"Precipitation both in terms of rainfall intensity and volume can encourage rill and gully development. Poesen et al. (2003) cites "rain thresholds" of 7.5 mm as a lower limit for rilling, 14.5 mm for gullies extending to 22 mm of rain.

Other observations cited within the literature review by Poesen et al. (2003), indicate rain on snow events can have a considerable effect on frozen/thawing soils, initiating ephemeral gullies (observed in Norway) (Oygarden (2003) cited in Poesen et al., 2003).

Sullivan and Foote (1983), found water related erosion was most frequently observed along roadsides, accounting for 15,309 occurrences or 81.5% of the dataset.

Precipitation intensity and duration were primary factors for sediment detachment, often dictating where sediment was deposited along a buffer.”

(Lake Superior Streams Sediment Assessment Phase 1

<https://www.pca.state.mn.us/sites/default/files/wq-b2-04.pdf>

(Doc 97) pg.419

“Climate change has caused rain patterns to change, with more frequent and extreme rainfalls,” said Evan Kane, a researcher in the School of Forest Resources and Environmental Science at Michigan Technological University.

“It’s important to understand the connection between the lake (Lake Superior) and its tributaries to predict the long-term impacts of climate change,” said Amy Marcarelli, the lead researcher and ecosystem ecologist at Michigan Technological University.

(The Outsize Impact Small Streams have On Lake Superior)

Plumes Fed by Minor tributaries Affect Ecology of the Great Lakes,
Great Lakes Echo , 12/27/2018

<https://www.wiscontext.org/outsized-impact-small-streams-have-lake-superior>

(Doc 88) pgs.402-406

Climatologist Kenny Blumenfeld from the Minnesota State Climatology Office notes that while things might tend to be drier, large rainfall events, like the one experienced in Duluth a few years ago, are getting slightly larger and more frequent.

<https://queticosuperior.org/blog/climate-change-northwoods-part-ii-climate-change-means-boundary-waters-region/> (Doc 98) pgs.420-428

Precipitation is increasing in some areas, and this trend is expected to continue because climate warming increases the intensity of the hydrological cycle, leading to greater evaporation and evapotranspiration, greater return rainfall, and greater runoff.

In higher latitude temperate regions, precipitation increases appear to result from greater frequency of intense storms. Increased hurricane intensity and more hurricane landfalls at more northerly locations are also expected, at least in the Atlantic (Emanuel 2005 , Webster et al. 2005). **The implications of increased storminess, runoff, and flooding are obvious in enhanced storm damage to trees and increased abundance of damaged trees that can serve as infestation loci for pests such as borers. Meanwhile, the increased areas of soil disturbance from flooding and treefall will subject ecosystems to potential enhanced establishment of invasive plants such as tamarisk in the Southwest. Note that the foregoing illustrates the fact that the effects of climate change are often driven by the increased *climate variability and extremes* that overlie the slow, chronic increase in mean temperatures. This increase in climate variability is predicted to continue with warming and is likely to produce the most obvious effects on ecosystem functioning (Overpeck et al. 1990).**

https://www.fs.fed.us/research/docs/invasive-species/wo_gtr79_83/wo_gtr79_83_091.pdf
(Doc 98A) pgs.428 A-C

Tributaries and water quality importance for Climate Change

Importance of Boundary Waters as cold water refuge

Peter Jacobson is a research scientist with the Minnesota Department of Natural Resources. Jacobson says it will be critical that we protect the cold water lakes and ensure they are going to be refuges from climate change in the future, protecting their water quality.

He notes that cold water fish are showing signs of change and that lakes in the Boundary Waters could provide a refuge for such species.

<https://queticosuperior.org/blog/climate-change-northwoods-part-ii-climate-change-means-boundary-waters-region/> (Doc 98) pgs. 420-28

Cold tributaries like Sixmile Creek and other cold, clear water streams in the Lake Superior North and Rainy River Headwaters watersheds, are also an important component of larger waters biological integrity and should be included in protection strategies for larger subwatershed systems .

Not only does the Sixmile Creek tributary contribute cold water to the Temperance River, but the creek itself likely provides important thermal refugia for trout and other stenothermic organisms when temperature in the mainstem river reach stressful levels.

CONCLUSION

It is critical the water quality of these tributaries not be degraded by increased sedimentation which increases water temperature and degrades habitat.

<https://www.pca.state.mn.us/sites/default/files/wq-ws3-04010101b.pdf>

LSN Watershed Monitoring and Assessment Report, January 2017.

(Doc 99) pg. 429

Understanding the importance of small, cold tributaries to the ecological integrity of larger River systems may be of critical importance in protection planning efforts.

Tributaries offer spawning and nursery habitat for trout and other fishes and may serve as critical refugia for fish and other aquatic organisms during periods of thermal stress.

<https://www.pca.state.mn.us/sites/default/files/wq-ws3-04010101b.pdf>

(Doc 53) pg.339

While land management, riparian and shoreland development, and road-stream intersections may represent acute threats to aquatic health in the Lake Superior – North Watershed, threats may be posed by climate change, and the interaction of longer-term and more nebulous change with other stressors.

Many of the watershed's streams support sensitive and stenothermic organisms that depend on perennial cold water streams carrying low concentrations of sediment and nutrients. These habitat and water quality conditions are the result of interacting factors of climate, hydrogeology, and land cover, and may be degraded by changes in any of these factors.

Predictive models incorporating climate and land use changes suggest that aquatic resources of the Lake Superior – North Watershed are likely to experience higher temperatures, reduced dissolved oxygen, increased erosion, and other associated stress in the near future (Johnson et al. 2013, Herb et al. 2014).

These changes are likely to have negative effects on the health of aquatic systems, though planning and BMP implementation may mitigate some impacts.

Climate change is perhaps the most relevant potential stressor for the watershed's aquatic resources. Land managers, community leaders and other stakeholders should consider the best available information regarding climate change and other potential stressors when developing restoration and protection strategies for the watershed.

<https://www.pca.state.mn.us/sites/default/files/wq-ws3-04010101b.pdf>

(Doc 53A) pg.340

For example, understanding the importance of small, cold tributaries to the ecological integrity of larger river systems may be of critical importance in protection planning efforts. Tributaries often spawning and nursery habitat for trout and other fishes, and may serve as critical refugia for fish and other aquatic organisms during periods of thermal stress.

A watershed-based focus that recognizes the connection between landscapes, riverscapes, and the condition of aquatic resources will be essential to protection and restoration efforts.

<https://www.pca.state.mn.us/sites/default/files/wq-ws3-04010101b.pdf>

(Doc 100) pg. 430

INVASIVE SPECIES and SPREAD RISK of the PROPOSED BORDER TO BORDER ROUTE

The Minnesota DNR states invasive plants are difficult to eradicate once established, recommending that the best way to protect natural areas is through prevention of the spread of invasive species(6) pg. 432. Motorized vehicles are considered to be efficient in the transport and spread of invasive species with plant seeds, spores and fragments adhering to multiple areas of vehicles(1)pg. 432, typically lodging in tires, treads, wheel wells, and underbodies(2) pg. 432 . In addition, transportation corridors often provide disturbed sites that allow invasive plants to establish(1)pg. 432.

Invasive species are better adapted to vehicular dispersal than noninvasive species, and difficult to eradicate once established. (3) pg.432

Roads and OHV impacts to vegetation and invasive species spread

“Roadways have been found to contribute to the spread of non-native species in many different systems. Maintenance of roads, coupled with increased vehicular traffic (on and off road), presents a unique conservation challenge in terms of preventing and managing the spread of non-native and invasive plant species.” (21) pg. 438

Invasives are already established along road corridors for much of the proposed trail.

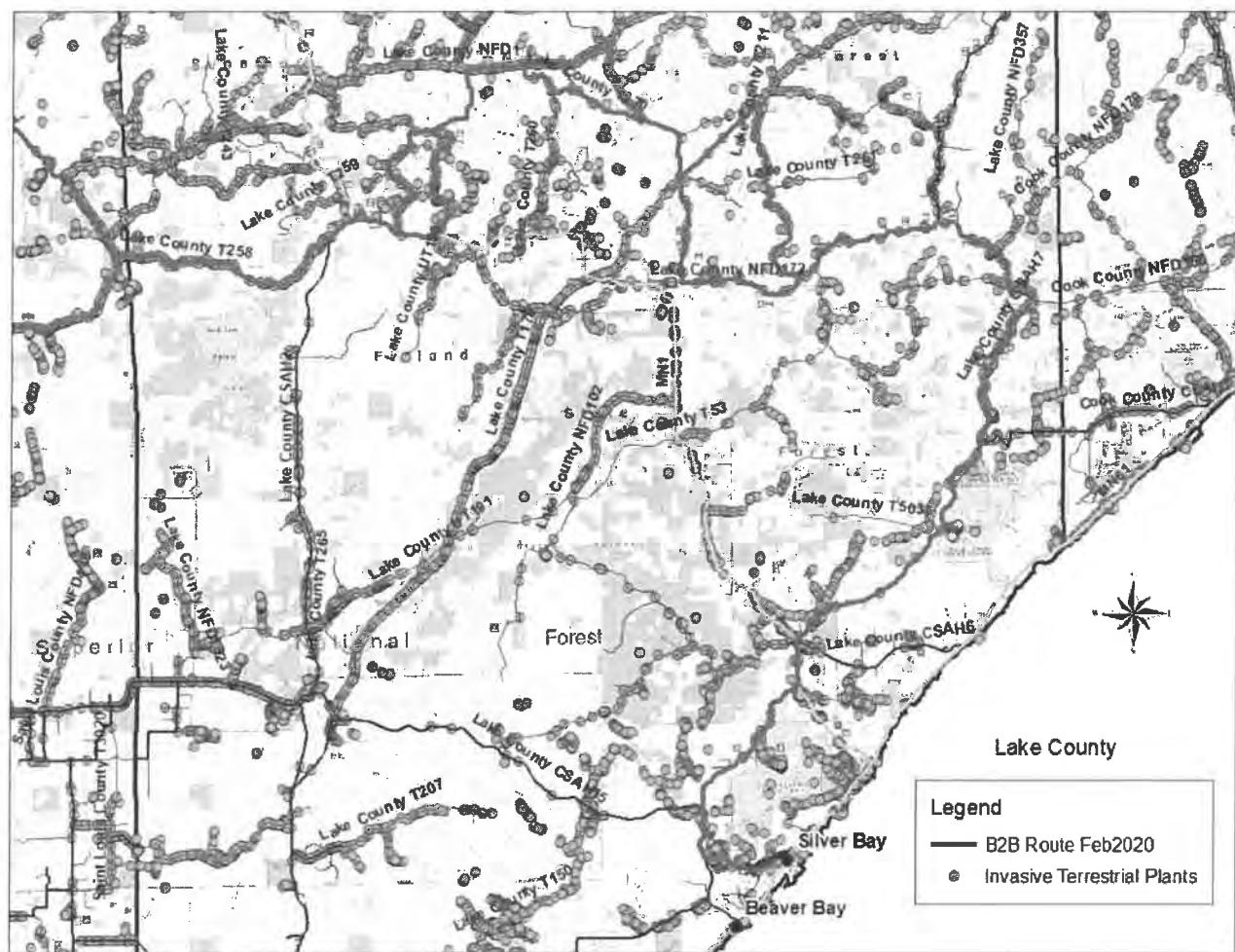
But more traffic means MORE invasives are constantly being introduced, on top of ongoing and spotty efforts to control what is already there.

There are continual ROW invasive treatments along all road jurisdictions (state, county, township, USFS, DNR, etc.), as managers do what they can to control them.

And these efforts are limited by funding, prioritized by hotspots, never completely remove established invasives, and need to be repeated every year. Invasive species have been classified that way by the MN Department of Agriculture because of their ability to aggressively spread and establish following introduction.

The map on the following page is of Lake County point data of invasives that shows reported opportunistic sightings only, by Mn DNR staff. This does not map any invasive species movement further into the surrounding landscape. It is a point of occurrence map for record keeping only and doesn't give a complete picture of what has spread how far from point of origin.

However, it shows quite clearly how corridors are *significantly* degraded and create a foothold for invasives to establish and spread, posing the potential of significant risk to ecosystems.



According to the Minnesota DNR, the designated, nationally advertised 764 mile B2B OHV touring route "will increase traffic and road usage ...an estimate may be a few thousand (vehicles) a year to start with on the more attractively marketed segments"(20). Pgs.434-436

The proposed Border to Border Route is a designated, 2 way route that would use mostly unpaved roads. Many of these roads would be primitive, single lane unpaved roads or Operational Management Level 2 or 3 Forest Service roads that would require vehicles to go off road to pass one another.

These primitive single lane roads have little or no shoulders and vehicles passing one another would be encroaching on and crushing roadside vegetation and buffer zones.

Vehicular impacts on vegetation range from selective kill-off of the most sensitive plants to complete loss of vegetation. Having to go off the route to pass other vehicles can crush and simultaneously shed invasive species seed they have collected along the route. This increases invasive species spread by dropping invasive species seeds in these areas where the vehicle tires have crushed native vegetation and scarified the soil which results in more effective implantation.

As a result of ORV use, the size and abundance of native plants may be reduced, which in turn permits invasive or nonnative plants to spread and dominate the plant community (GAO 2009). Impacts to vegetation can have cascading effects throughout an ecosystem. For example, on an intensively used ORV route in Idaho, native shrubs, bunch grasses, and biological crust were greatly reduced close to the route and replaced with rabbitbrush (*Chrysothamnus* spp.) and non-native cheat grass (*Bromus tectorum*; Munger et al. 2003). Because of these habitat changes, fewer reptiles were found alongside the route than were found 100 m away (328 ft).

In another example of cascading impacts, Waddle (2006) found that three out of four species of ground-dwelling anurans in Florida were negatively influenced by ORVs due to trampling of vegetation and altered hydrology.

(25)pgs. 457-458.

Vehicle and 4 WD seed accumulation

In addition to trampling effects, ORVs are a major vector for non-native invasive plant species. With deeply grooved, wider treads for traction and large undercarriages, ORVs can unintentionally transport invasive non-native species deep into forestlands.

For example, one study found that in a single trip on a 16.1 km (10 mi) course in Montana, an ORV dispersed 2,000 spotted knapweed (*Centaurea stoebe*) seeds (Montana State University 1992). In Wisconsin, a survey of seven invasive plant species along ORV routes found at least one of these exotic plant species on 88% of segments examined (Rooney 2005). (25)

pgs.452-458

A Montana State University seed accrual study found that most seeds (99% on paved and 96% on unpaved roads) stayed attached to a study vehicle after travelling 160 miles under dry conditions. Further, seeds picked up in mud which then dries on a vehicle can travel almost indefinitely until it rains or the road surface is wet, allowing for long distance transport of seeds. This transport may result in deposition of seeds in areas where those species did not previously exist(1). Pg.432

Another study on seed accrual rates on different types of vehicles by a group that included the Department of Land Resources and Environmental Sciences of Montana University and the USDA Forest Service, found that a 4 WD vehicle driven on a dry unpaved road, accrued seeds at a rate of 420 seeds per 100 km, with a 19.6 fold increase under wet conditions of 8232 seeds per 100 km.

The same study reviewed non-native plant interception using vehicle wash units. They concluded that washing should focus on vehicles that recently had driven great distances, on unpaved surfaces or off-road.

These are the same conditions presented by proposed Border to Border Touring route, which is 764 miles, would have traffic from out of state due to national advertising, and is comprised of almost all unpaved roads. (21) pgs. 437-445

Invasive Species prevalent in Northeastern Minnesota and effects

Invasive species can have significant deleterious impacts to native systems, including the loss of native species and loss of wildlife habitat (7,8). pg.432

Invasive species are among the leading threats to native wildlife. Approximately 42 percent of threatened or endangered species are at risk due to invasive species.

Invasive species cause harm to wildlife in many ways. When a new and aggressive species is introduced into an ecosystem, it may not have any natural predators or controls. It can breed and spread quickly, taking over an area. Native wildlife may not have evolved defenses against the invader, or they may not be able to compete with a species that has no predators.

The direct threats of invasive species include preying on native species, outcompeting native species for food or other resources, causing or carrying disease, and preventing native species from reproducing or killing a native species' young.

There are indirect threats of invasive species as well. Invasive species can change the food web in an ecosystem by destroying or replacing native food sources.

The invasive species may provide little to no food value for wildlife. Invasive species can also alter the abundance or diversity of species that are important habitat for native wildlife.

(26)pg. 459

The proposed designated route that would be nationally advertised and result in an increase of highway licensed OHV traffic, would travel directly through significant areas of outstanding biodiversity in Lake County. Vehicles traveling long distances on unpaved roads have been shown in studies to be some of the most efficient carriers of seeds. These outstanding areas

and others like it along the entire route, would be put at increased risk for invasive species spread that has the potential to degrade habitat, reduce biodiversity and alter the ecosystem.

At the conclusion of work in a geographic region, Minnesota Biological Survey (MBS) ecologists assign a biodiversity significance rank to each survey site. These ranks are used to communicate the statewide native biological diversity significance of each site to natural resource professionals, state and local government officials, and the public. The biodiversity ranks help to guide conservation and management.

A site's biodiversity significance rank is based on the presence of rare species populations, the size and condition of native plant communities within the site, and the landscape context of the site (for example, whether the site is isolated in a landscape dominated by cropland or developed land, or whether it is connected or close to other areas with intact native plant communities). (28) pg.462

Biodiversity significance rankings

Biodiversity significance is a ranking based on the size and condition of native plant communities and how they fit in an ecological landscape. It also includes the presence or absence of rare species populations. The rankings are 'outstanding', 'high', 'moderate' and 'below'. Ecologists with the Minnesota Biological Survey determine this status. **This ranking is used to help prioritize Natural Area protection efforts.**(29) pg. 464-66

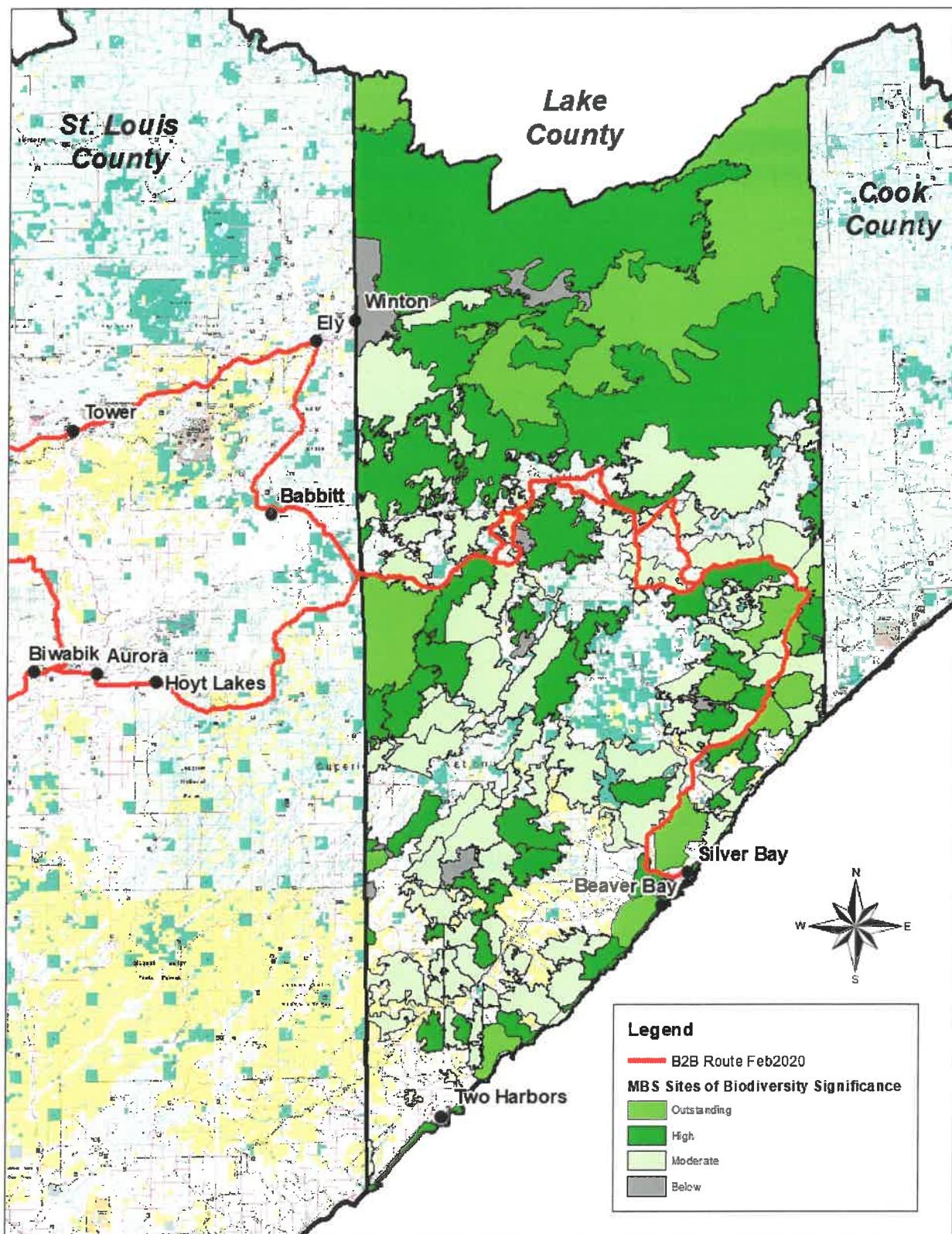
There are four biodiversity significance ranks, outstanding, high, moderate, and below:

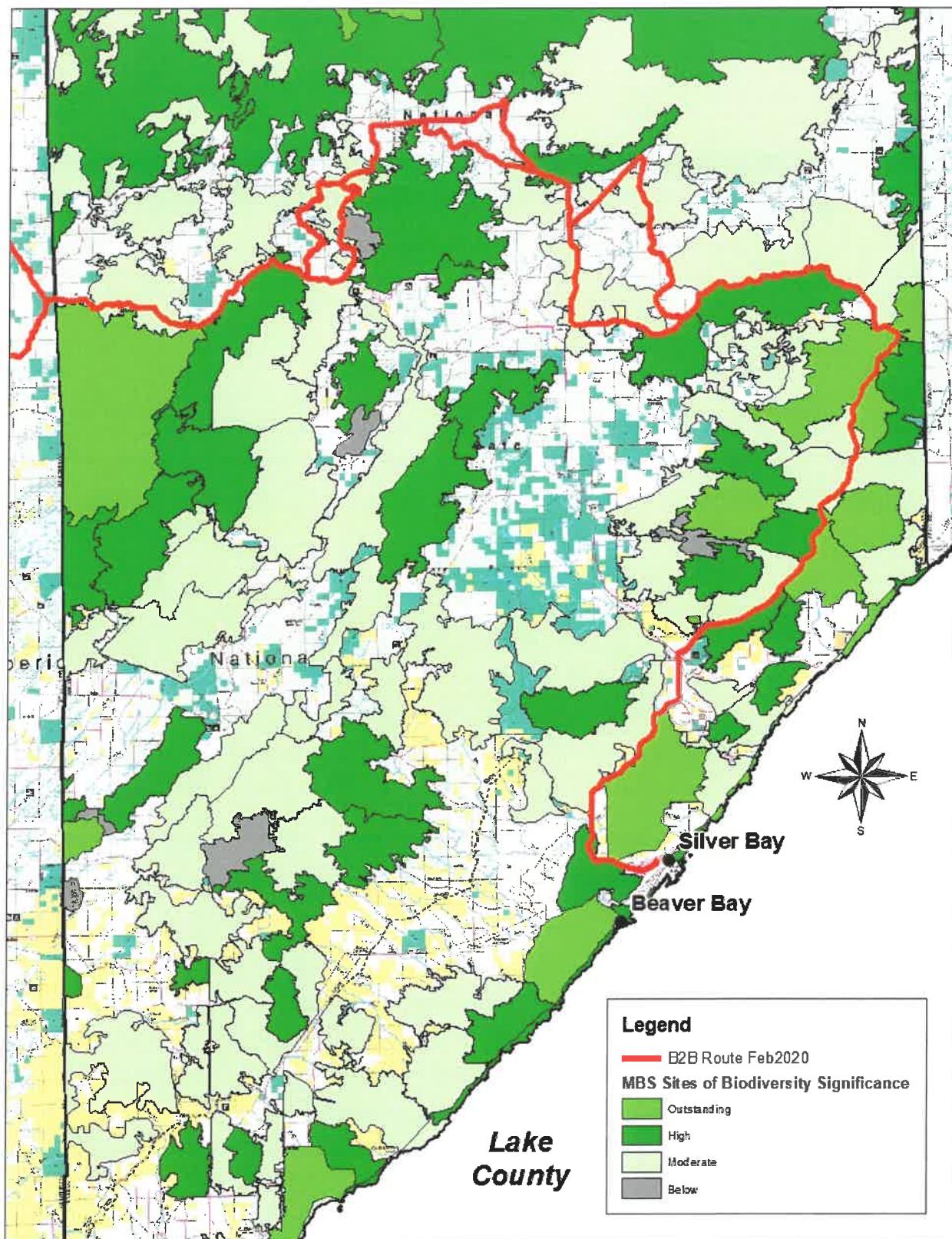
- **"Outstanding"** sites contain the best occurrences of the rarest species, the most outstanding examples of the rarest native plant communities, and/or the largest, most ecologically intact or functional landscapes
- **"High"** sites contain very good quality occurrences of the rarest species, high-quality examples of rare native plant communities, and/or important functional landscapes.
- **"Moderate"** sites contain occurrences of rare species, moderately disturbed native plant communities, and/or landscapes that have strong potential for recovery of native plant communities and characteristic ecological processes.
- **"Below"** sites lack occurrences of rare species and natural features or do not meet MBS standards for outstanding, high, or moderate rank. These sites may include areas of conservation value at the local level, such as habitat for native plants and animals, corridors

for animal movement, buffers surrounding higher-quality natural areas, areas with high potential for restoration of native habitat, or open space.(28) pgs.462-63

https://www.dnr.state.mn.us/eco/mcbs/biodiversity_guidelines.html

As the two maps on the following pages show, the proposed route in Lake County, would pass through regions of the two highest rankings for biodiversity, Outstanding and High. These rankings of Biodiversity Significance are used to prioritize areas for protection efforts. Increased traffic of a designated, nationally advertised route for high impact, highway licensed OHVS on historically low traffic volume, unpaved roads, has the potential to negatively impact these areas.





The value of biodiversity (the variety of life and its processes)

Minnesota's biodiversity has evolved over millennia into complex ecosystems. A myriad of species interact with each other and environmental factors such as soils, topography, hydrology and climate within these ecosystems.

Preserving biodiversity has benefits (ecosystem services) such as:

- Maintaining healthy, stable plant and animal populations
- Protecting genetic diversity
- Protecting water and soil resources
- Filtering pollution and nutrient recycling
- Contributing to climate stability and carbon storage
- Recovering from catastrophic events
- Providing sources for food, medicine and other products
- Research, education and monitoring
- Recreation, tourism and inspiration

In areas where biodiversity is threatened, losing species can affect the ecosystem's ability to function properly and provide these services. Maintaining biodiversity reduces voids and the entire ecosystem maintains a higher degree of resilience.

Conservation planning for natural areas focuses on areas of high biodiversity as well as habitats for rare species.

Resilience as a strategy

Resilience is the capacity of an ecosystem to cope with disturbance. Resilience is critical to reducing climate change and fragmentation from land development. As climate change affects ecosystems they will face increasing vulnerability. An effective strategy at easing these negative impacts is to build resilience into native communities by:

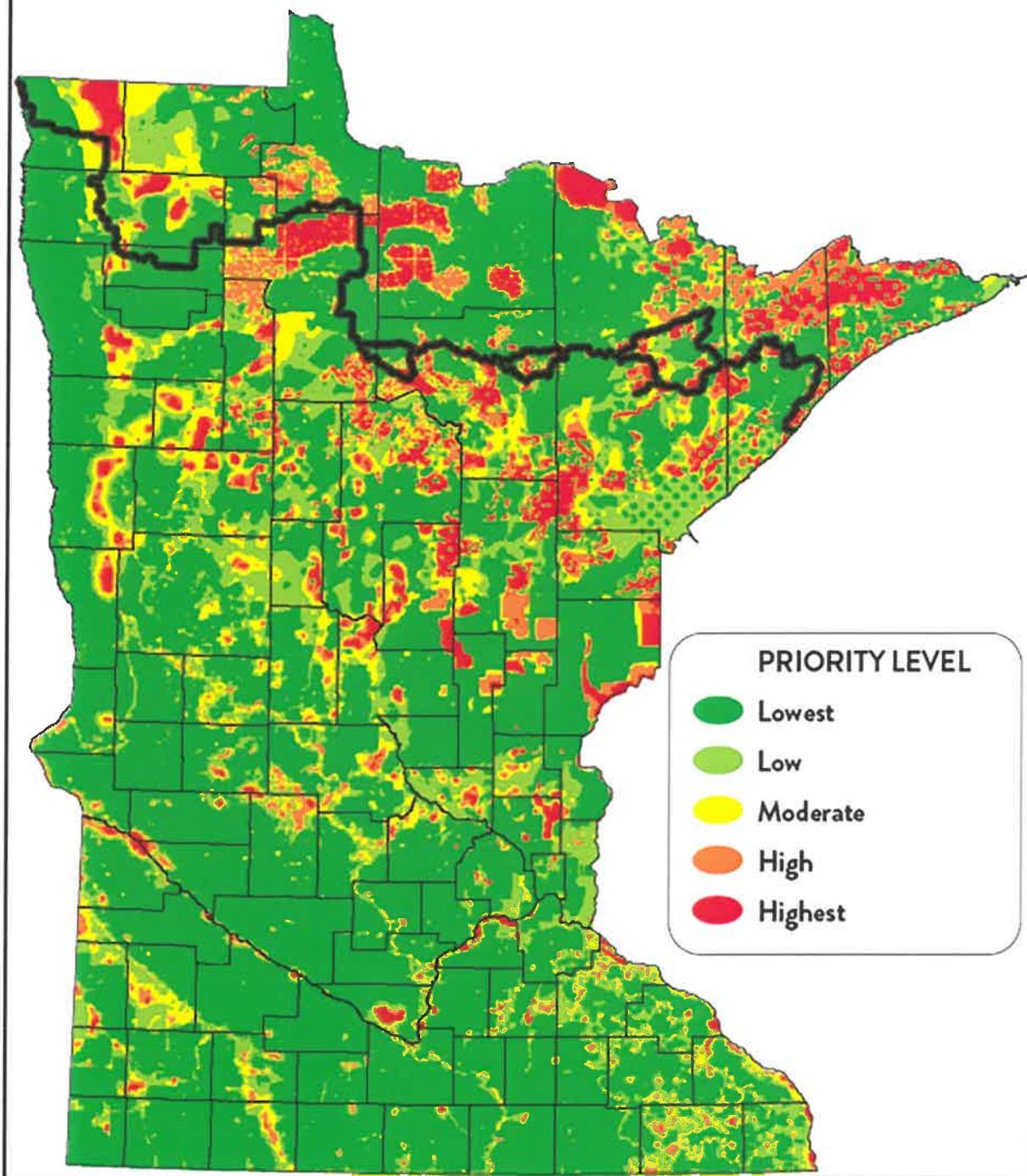
- Creating large protected areas and corridors to provide pathways for species to migrate to more suitable habitats
- Preserving a greater variety of habitats for desirable species

The SNA program is using both strategies for resilience to maintain Minnesota's biodiversity.
(29) pgs. 464-66

This is the reference for the Conservation Prioritization Map on the following page.

<https://www.dnr.state.mn.us/snap/plan.html>

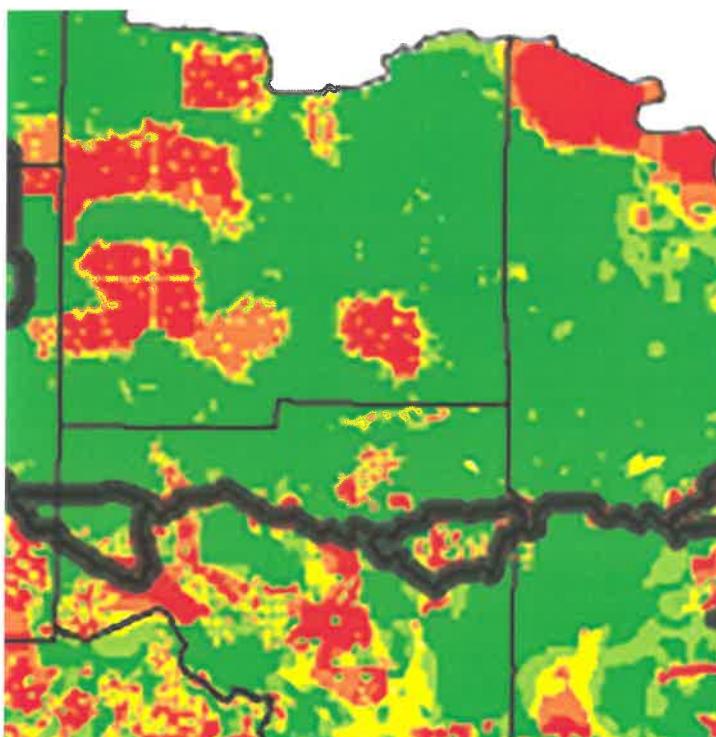
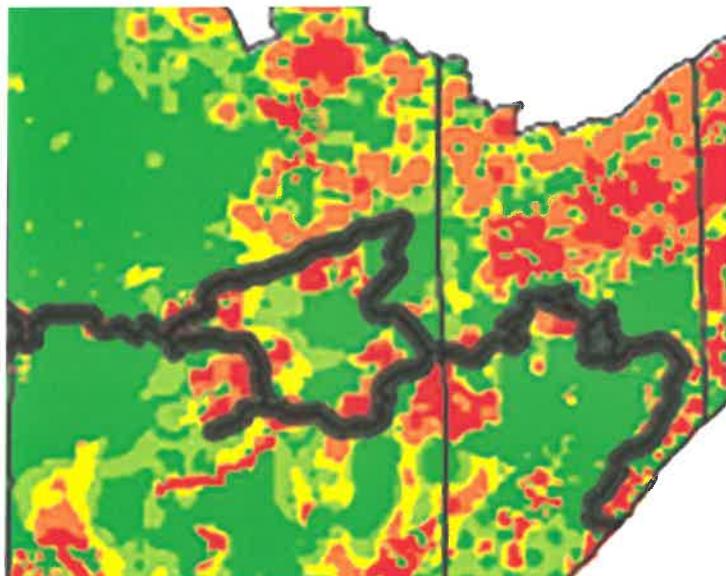
Conservation Prioritization Areas

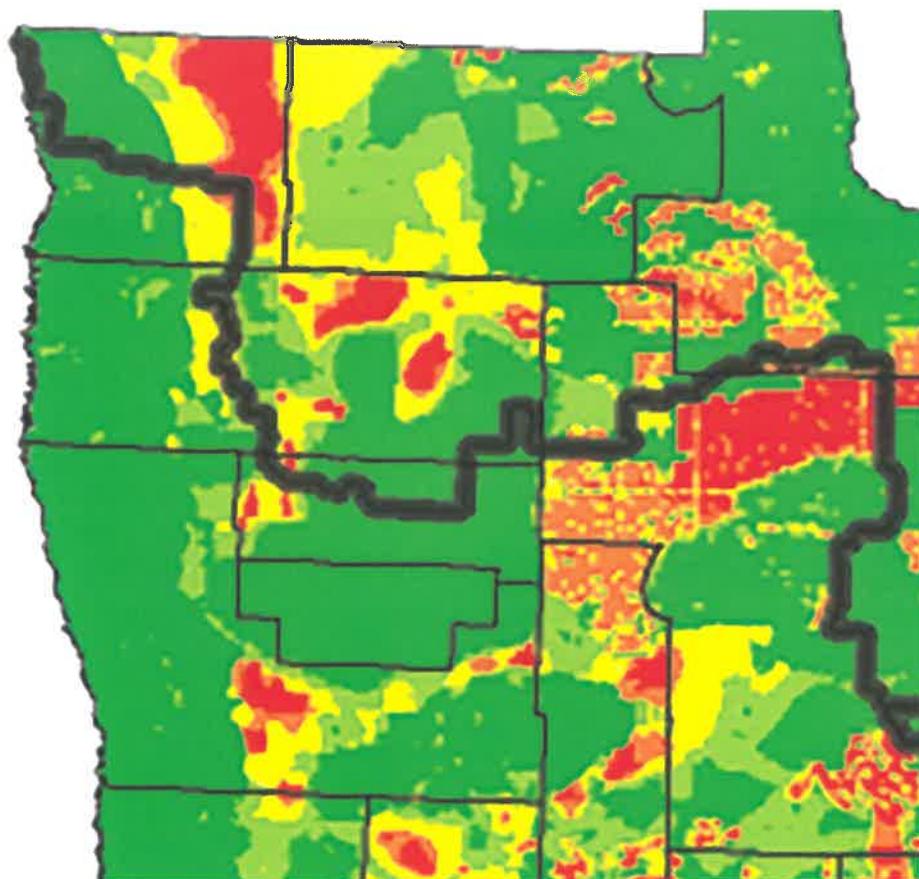


Enlargements of Proposed Route Sections, from East to West :

Red areas are the highest priority Conservation Areas

Orange areas are high priority Conservation Areas





CONCLUSION:

The proposed route travels through areas ranked for the highest conservation prioritizations and high conservation prioritization. An environmental assessment of these areas should be conducted to analyze the potential impact risks of the proposed route to the ecosystems in the near and long term future and if a designated, nationally advertised, high impact vehicle route is environmentally sustainable in these top prioritization conservation areas.

Invasive species inventoried and managed in various projects by the Minnesota Department of Natural Resources are:

Bird's foot trefoil, black locust, bull thistle, butter and eggs, Canada thistle, chicory, common buckthorn, common burdock, common teasel, cow vetch, crown vetch, cut-leaved teasel, garlic mustard, glossy buckthorn, Japanese hops, Japanese/Bohemian knotweed, leafy spurge, meadow knapweed, moth mullein, must thistle, non-native bush honeysuckles, Oriental bittersweet, poison hemlock, Queen Anne's lace, reed canarygrass, Siberian elm, Siberian peashrub, spotted knapweed, tansy, wild parsnip, wooly cupgras

Common Tansy, Canadian Thistle, Spotted Knapweed and Purple Loosestrife are some of the species of greatest concern in Northeastern Minnesota. (4,5) pg. 432

Garlic mustard is also moving north in Minnesota and is a serious threat to native plant species overtaking forest floor. It is both challenging and expensive and to manage. (24,27) pgs.449-51 & 460-61

These are prohibited noxious weeds to be controlled, meaning effort must be made to prevent the spread, maturation and dispersal of any propagating parts, thereby reducing established population and preventing reproduction and spread a required by Minnesota Statues, Section 18.78.

COMMON TANSY: Tansy is widespread across most northern United States and Canadian provinces. (17)pg. 432. Tansy can be transported on vehicles that have been in infested areas. Seeds can remain viable for up to 25 years. Common tansy often infests disturbed sites such as roadsides .(9)pg. 432. Tansy forms very dense patches that crowd out native plants. It can clog drainage ditches restricting the flow of water.

It may threaten the ecological health of areas through reduction of wildlife habitat and species diversity. It is also mildly toxic. Its effects are cumulative and long term consumption by wildlife can lead to death. Some people have reported reactions to the oil from this plant. (10) pg. 432

CANADA THISTLE: Canada thistle occurs throughout the northern U.S., and has been declared a noxious weed in 43 states. (18)pg. 432. It is highly invasive, degrades wildlife habitat, and can hinder reforestation and landscape restoration efforts. Once a population gets established, it begins to quickly displace native vegetation, including desirable pollinator habitat, and creating large stands with little biological diversity and low habitat value, creating large impassable stands. (11)pg. 432. Seed can be spread over wide distances when it adheres to the surfaces and undercarriages of road vehicles. (12). pg. 432

Seed can survive in soil for up to 20 years. It's prickly flowers and leaves are unsuitable for grazing. (Ross and Lembi, 1999). A seedling can reproduce vegetatively in as little as 6 weeks after germination, and a single plant can develop a lateral root system with a 20 foot spread in a single season.

(23) pgs. 447-448

GARLIC MUSTARD: This is a challenging and expensive invasive to manage. (27) pg. 461 . Garlic mustard is a European plant that spreads from garden to the woods where it quickly may take over the forest floor. Overwhelming native plant species, garlic mustard alters habitat for insects utilized as food by birds and small mammals. Insects, including some butterflies, may be affected through the lost diversity in plants and loss of suitable egg-laying substrate (MSU, 2008). Garlic mustard may also affect the tree composition by creating a selective barrier that some seedlings may not be able to overcome (MSU, 2008).

These changes in tree composition could have significant long-term effects. The plant has been circumstantially tied to decreased herbaceous species richness on forest floors. The tiny seeds are easily spread by birds or through human vectors such as logging equipment or recreational vehicles. Garlic mustard is classified as a prohibited noxious weed. (24)pgs. 449-51

SPOTTED KNAPWEED: Spotted knapweed is currently found throughout most of the northern half of Minnesota, and is now a common weed of roadsides in Minnesota(19) pg. 432. Spotted knapweed has a long flowering period (June through October) and produces seed throughout that period. A single plant can produce over 1,000 seeds. The seeds can remain viable in the soil for over 5 years and they can germinate in the spring through early fall in a wide range of soil depths, soil moisture contents and temperatures. The plants have few predators and are unpalatable to grazing animals. It produces a toxin called catechin in its foliage and roots which retards the growth of surrounding plants, allowing it to spread more rapidly and form monocultures. The root system does not anchor soil well leading to elevated erosion levels at highly infested sites. Because of its high competitive ability, spotted knapweed can dominate an area, leading to a reduction of species diversity. Spotted knapweed infestations lower the number and diversity of native plants with the potential for large-scale and long-term ecosystem-level effects including reduced wildlife habitat and increased surface water runoff and the subsequent erosion.(13)pg. 432. Invasive plants such as spotted knapweed have overrun vast areas of the United States to the detriment of native plants and wildlife(14).pg. 432.

Spotted knapweed is poisonous to other plants (phytotoxic)(15).pg. 432.

A Montana State University study showed that a vehicle driven several feet through a spotted knapweed infestation could pick up about 2,000 seeds. Seed longevity is greater than eight years. Seed heads are caught in the undercarriage of vehicles enabling long distance dispersal.(16) pg. 432 .

PURPLE LOOSESTRIFE : Optimum habitats for purple loosestrife include fresh water marches, open stream margins and alluvial floodplains. Purple loosestrife also invades wet meadows, pasture wetlands, cattail marshes, stream and river banks, lake shores, irrigation ditches, drainage ditches and stormwater retention basins.

One adult purple loosestrife plant can produce 2.5 to 2.7 million seeds annually. These seeds can easily be dispersed and transported by water, wind, bird feathers, animal fur, footwear, boats, boat trailers and car tires.

It displaces and replaces native flora and fauna, eliminating food, nesting and shelter for wildlife. If wildlife species are displaced, those that cannot move to new areas may be lost. By reducing habitat size, purple loosestrife has a negative impact on fish spawning and waterfowl habitat.

There is no method that will completely eliminate purple loosestrife.
(24B) pgs. 451C-E

A sound management plan will take several years of commitment. Regular follow up is critical to ensure a population is decreasing. (24A) pgs. 451 A-B

No funding for invasive spread monitoring or control

There are no funds in the proposed route project nor sufficient funds in the DNR invasive species account to add staff for the monitoring and control management of invasive species on the 764 mile proposed route. The DNR Invasive Species Account does not have sufficient funds to manage *current* invasive species issues. The DNR Invasive Species Account in the DNR 2017 Annual Budget Report States under Forecast: "The fund balance has been declining for many years due to appropriations exceeding revenues. Each year the DNR ensures a positive balance by reducing expenditures. " **The 2018-2021 DNR projections in that report estimate a *one million dollar deficit* for the Invasive Species Account by 2021.** (22) pg.446

CONCLUSIONS:

The proposed Border to Border Touring Route is an approximately 764 mile route across northern Minnesota. Much of the route currently mapped by the DNR, utilizes historically lightly traveled roads and traverses a primarily wilderness terrain. The Minnesota DNR estimates segments of the Touring Route will attract "a few thousand (OHVs) to start with" per season.

The proposed Border to Border route would carry great risk for the significant potential of cumulative, unchecked invasive species spread across the state. The designated route is on unpaved roads that would cross 4 biomes within Minnesota itself and is nationally advertised to attract out of state traffic, with no provision for wash stations and no funding for invasive species oversight or control management.

The proposed route would travel through areas that are designated highest and high conservation priority areas, as well as areas designated as outstanding and high biodiversity areas.

These areas are delineated to receive protection efforts and should be reviewed for the significant potential for an increase in environmental impacts due to an increase in high impact, off road vehicle traffic from the proposed designated, nationally advertised, signed and mapped proposed route.

There would be an increased spectrum of invasive species brought into Minnesota from out of state vehicles due to the national advertising of the route. It is currently nationally advertised on a National Off Highway Vehicle Conservation Council website and will be on the DNR website, as well as on Off Road Club websites and social media around the country.

Efforts at terrestrial invasive species control and eradication have been underfunded for years according the DNR annual invasive species report, with a projected deficit of one million dollars by 2021. To remain solvent, the DNR reduces expenditures for invasive species management and control, as noted in its annual report .

Since there is not sufficient current funding for the DNR to manage invasive species and since the Border to Border proposal allocates no additional funds or ongoing funds for professional staff to monitor and control invasive species, it is highly unlikely there would be staff or resources available to deal with an anticipated increase in terrestrial invasive species due to the increase in OHV traffic in sensitive wilderness areas as a result of the proposed Border to Border Touring Route.

Traveling in packs and caravans is not uncommon for this sport. There are many popular organized events such as Jeep Jamboree USA which averages 100 vehicles with over 500 participants per event. Caravans and packs of vehicles would

significantly add to the increased risk of invasive species spread and compound the effects of spread along the entire proposed route.

Wildlife

Overview

Nationally promoting a single, designated B2B route on unpaved forest roads will negatively impact the habitats and overall fitness of native Minnesota wildlife. While existing roads will be used, the active nation-wide promotion of the route on the DNR website and Off Roading clubs around the country and on social media, will increase road use and traffic load on historically low volume roads, resulting in increased disturbance in known habitats and home ranges of sensitive and threatened species.

No terrestrial vertebrate taxa seem immune to the myriad of road-associated factors that can degrade habitat or increase mortality. These multifaceted effects have strong management implications for landscapes characterized by moderate to high densities of roads. In such landscapes, habitats are likely underused by many species that are negatively affected by road-associated factors.

Moderate or high densities of roads sometimes index areas that function as population sinks that otherwise would function as source environments were road density low or zero.

<https://www.fs.fed.us/pnw/pubs/gtr509.pdf> (Ref 35)pgs.586-588

Effects of roads on vertebrate populations act along three lines: direct effects, such as habitat loss and fragmentation; road use effects, such as traffic causing vertebrate avoidance or road kill; and additional facilitation effects, such as overhunting or overtrapping, which can increase with road access. <https://www.fs.fed.us/pnw/pubs/gtr509.pdf> (Ref 35) pgs.568-588

Determining whether or not a project is likely to affect a listed species

Example:

To make a determination of whether the 2004 Forest Plan is likely to affect listed species or designated critical habitat the definitions for determinations of effect, given in the Section 7 consultations from the Endangered Species Consultation Handbook (USDI FWS and NMFS 1998), are used. In making the determinations in this BA the following conclusions were considered.

No Effect – the appropriate conclusion when the action agency determines its proposed action will not affect a listed species or its designated critical habitat.

May Effect - the appropriate conclusion when a proposed action *may* pose any effects on listed species or designated critical habitat. When the Federal agency proposing the action determines that a “may affect” situation exists, then they must either initiate formal consultation or seek written concurrence from the Fish and Wildlife Service that the action “is not likely to adversely affect” (see definition below) listed species.

Is likely to adversely affect – the appropriate finding in a biological assessment (or conclusion during informal consultation) if any adverse effect to listed species may occur as a direct or indirect result of the proposed action or its interrelated or independent actions, and the effect is not: discountable, insignificant, or interdependent actions, or beneficial. In the event the overall effect of the proposed action is beneficial to the listed species, but is also likely to cause some adverse effects, then the proposed action “is likely to adversely affect” the listed species. If incidental take is anticipated to occur as a result of the proposed action, then an “is likely to adversely affect” determination should be made. An “is likely to adversely affect” determination requires the initiation of formal section 7 consultation.

https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5351554.pdf

(Ref 14) pgs. 523-525

For reference, effects of the action are defined in the Section 7 Consultation Handbook (USDI FWS and NMFS 1998) as;

Effects of the Action – the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or independent with that action. These effects are considered along with the overall effects to the species for purposes of preparing a biological opinion on the proposed action.

Current knowledge of broad-scale effects on a variety of taxa is highly certain and provides an overarching paradigm from which likely or presumed effects on single species at local scales can be inferred. (Trombulak and Frissell 2000).

<https://www.fs.fed.us/pnw/pubs/gtr509.pdf> (Ref 35) pgs.587-589

Many road-associated effects on terrestrial vertebrates are intimately linked to managing human activities related to road access. Accordingly, mitigation of road-use effects requires effective control of human access to roads related to managing livestock, timber, **recreation**, hunting, trapping, and mineral development.

Forest Carnivores are especially vulnerable to road mortality because they have large home ranges that often include road crossings (Baker and Knight 2000).

<https://www.fs.fed.us/pnw/pubs/gtr509.pdf> (Ref 35) pgs.587-589

In recent research in the interior Columbia River basin, Wisdom and others (2000) identify more than 65 species of terrestrial vertebrates negatively affected by many factors associated with roads. Specific factors include habitat loss and fragmentation, negative edge effects, reduced densities of snags and logs, overhunting, over- trapping, poaching, collection, disturbance, collisions, movement barriers, displacement or avoidance, and chronic, negative interactions with people.

<https://www.fs.fed.us/pnw/pubs/gtr509.pdf> (Ref 35) pgs.587-589

The road and road-associated effects described by Wisdom and others (2000) were synthesized from research conducted across the world; the synthesis focused on multiple species encompassing diverse taxa and environmental requirements; the synthesis addressed an extreme range of environmental conditions on federal lands administered by the Forest Service, the Bureau of Land Management, and state, private, and tribal landowners; and the synthesis focused on large-scale, overarching effects common to many species and conditions.

These factors and their effects on vertebrates in relation to roads are summarized from Wisdom and others (2000) as follows:

Road construction converts large areas of habitat to nonhabitat (Forman 2000, Hann and others 1997, Reed and others 1996); **the resulting motorized traffic facilitates the spread of exotic plants and animals, further reducing quality of habitat for native flora and fauna** (Bennett 1991, Hann and others 1997). **Roads also create habitat edge** (Mader 1984, Reed and others 1996); **increased edge changes habitat in favor of species that use edges, and to the detriment of species that avoid edges or experience increased mortality near or along edges** (Marcot and others 1994).

Species dependent on large trees, snags, or logs, particularly cavity-using birds and mammals, are vulnerable to increased harvest of these structures along roads (Hann and others 1997). Motorized access facilitates firewood cutting, as well as commercial harvest, of these structures.

Several large mammals are vulnerable to poaching, such as caribou, pronghorn antelope, mountain goat, bighorn sheep, wolf, and grizzly bear (Autenrieth 1978, Bruns, 1977, Chadwick 1973, Dood and others 1986, Greer 1985, Gullison and Hardner 1993, Horejsi 1989, Knight and others 1988, Lloyd and Fleck 1977, Luce and Cundy 1994, Mattson 1990, McLellan 1990, McLellan and Shackleton 1988, Mech 1970, Scott and Servheen 1985,

Singer 1978, Thiel 1993, Van Ballenberghe and others 1975, Yoakum 1978). Roads facilitate this poaching (Cole and others 1997).

Gray wolf and grizzly bear experience chronic, negative interactions with humans, and roads are a key facilitator of such interactions (Mace and others 1996, Mattson and others 1992, Thiel 1985). Repeated, negative interactions of these two species with humans increases mortality of both species and often causes high-quality habitats near roads to function as population sinks (Mattson and others 1996a, 1996b; Mech 1973).

Carnivorous mammals such as marten (*Martes americana*), fisher (*M. pennanti*), lynx (*Lynx canadensis*), and wolverine (*Gulo luscus*) are vulnerable to overtrapping (Bailey and others 1986, Banci 1994, Coulter 1966, Fortin and Cantin 1994, Hodgman and others 1994, Hornocker and Hash 1981, Jones 1991, Parker and others 1983, Thompson 1994, Witmer and others 1998), and overtrapping can be facilitated by road access (Bailey and others 1986, Hodgman and others 1994, Terra-Berns and others 1997, Witmer and others 1998). Movement and dispersal of some of these species also is believed to be inhibited by high rates of traffic on highways (Ruediger 1996), but this has not been validated. Carnivorous mammals such as lynx also are vulnerable to increased mortality from highway encounters with motorized vehicles (as summarized by Terra-Berns and others 1997).

<https://www.fs.fed.us/pnw/pubs/gtr509.pdf> (Ref 35) pgs. 587-589

Additionally many side roads branch off the proposed B2B, and there is no guarantee that users would not explore beyond the designated route increasing traffic on roads that are less traveled and risk altering more pristine habitat. And, as popularity and awareness of the route grows, the impact of traffic on the designated route - and those who choose to venture beyond - will become increasingly more significant.

Potentially impacted wildlife includes numerous species of interest in Minnesota (Ref 7) and the Superior National Forest as well as nationally threatened species (Ref 8). This section will first address the general impacts to wildlife, and then focus specifically on the impacts to the Canada Lynx - as a federally threatened species.

For the threatened Lynx - and all wildlife along the proposed route - the increase in disturbance for recreational purposes is significant, cannot be justified and is simply not worth the risk to affected species.

(Ref 7) pgs. 490-495, (Ref 8) pgs. 496-502

General Wildlife Impacts

Traffic Increase and Noise Levels

Noise originating in human activity is a globally pervasive pollutant that can be detrimental to a range of animal species, with cascading effects on ecosystem functioning. Anthropogenic (human-created) noise affects species' occupancy, behavior, distribution, reproduction, physiology, and ultimately fitness. Noise can be an invisible source of habitat degradation, influence predator-prey dynamics, and change the provision of ecosystem services.

Terrestrial noise has been shown to affect birds, mammals, reptiles, amphibians, and invertebrates. (Ref 1) pgs.472-480

While existing roads will be used, the active, national promotion of the route will increase traffic density. The estimate by the initial B2B project manager Mary Straka in a March 2018 letter to Clearwater Lake Association President stated an estimate of 2,000 vehicles for the first year on the more attractively marketed segments. (Doc 7)pgs. 232-34

Since the B2B is a designated OHV route for 2 way traffic, that would be nationally advertised on websites with maps and posted signs defining one specific route, it is highly likely this would consolidate users in packs and caravans that does not exists with current dispersed, sustainable traffic loads.

This was the concern the US Fish and Wildlife Service wrote about to the DNR in March 2017. (Doc 6) pg. 231 In addition, OHV Club and Jeep jamboree events are popular with the OHV recreationists. Events such as Jeep Jamobree USA average 100 vehicles, with 500 passengers.

Individual vehicles traveling in these caravans will be louder than typical cars. This in combination with the vehicles traveling in caravans, has the potential to result in significantly greater auditory impact than current local traffic

CONCLUSION:

An Environmental Assessment is needed to determine if periods of cumulatively louder noise of longer duration from caravans of vehicles (sometimes numbering 100 or more), is significantly more harmful to wildlife than the current and historically brief duration of noise from a single or few vehicles in dispersed traffic.

An increase of 10 db in Sound Pressure Level is perceived to be approximately twice as loud. Thus a 20 db gain would seem to be about 4 times as loud.

<https://trace.umd.edu/docs/2004-About-dB> (Ref 33) pg. 583

1.- Noise emitted from certain types of OHVs can be as high as 110 decibels, which is near the threshold of human pain. In general, sounds above 85 db are harmful, depending on frequency and length of exposure.

<https://www.uofmhealth.org/health-library/tf4173> (Ref 34) pgs. 584-585

Although sounds from OHV motors are not the loudest anthropogenic sounds, in wildlife habitats they are emitted more frequently than other high-intensity sounds, and the effect on animals can be significant. (Ref 2) pgs.481-483

2.- Disturbance includes the myriad ways in which wildlife suffer from the noise pollution and human presence which results from ATV use. The average ATV with a muffler produces noise at a level of 81-111 dB (Bluewater Network 2002).

Being in the vicinity of this volume of noise can cause direct damage to wildlife; they can suffer auditory damage just as humans can, and the noise can also directly affect predator-prey relationships by masking the sounds that generally have an important role in those interactions. High levels of background noise can have a number of indirect effects as well.

Noise can cause wildlife to be stressed, and it can affect their balance of energy expenditures, cause an increase in animals' heart rates, and affect behavior patterns such as nesting and reproduction or feeding and foraging. (Ref 3)

pgs. 484-85

Noise generated by OHVs results in a heightened state of alert which negatively affects species fitness including survival and reproduction rates. -

If an ATV produces 80 decibels at 50 feet, and there is not dense vegetation to attenuate its noise, it will be at a volume of 56 decibels 800 feet away. This is loud enough to interfere with conversations.

If two such machines are together, and again assuming that there is not vegetation or other factors that directly interfere with the sound waves, they could be audible from two miles away. Noise has an impact on wildlife, as discussed above, and on non-motorized users. (Ref 3) pgs. 484-485A

ATV (and OHVs) travel can have a disproportionate effect on alteration of animal behavior when compared to other forms of outdoor recreation simply because of the distances a single user can travel in a day compared to more traditional methods of travel (Hershey 2011). (Ref 5) pgs. 486-489

The potential for eliciting stress responses from a broad spectrum of wildlife with noise, lights, and other disturbances associated with OHV activities exist. Indeed, studies have shown that ungulates, birds, and reptiles all experience accelerated heart rates and metabolic function during disturbance events; in turn, animals may be displaced and experience reproductive failure and reduced survivorship (Havlick, 2002).

Noise levels create a zone of impact far beyond the route

While the impact of noise on wildlife may be less tangible than other effects, we do know that more traffic means more noise, and higher level of disturbance alters behaviors. Since noise travels, the “zone of impact” created by noise from additional OHV traffic is far beyond the actual roadway.

Direct ecological effects extend over an area 10 times greater than the width of a road.

http://www.lauxen.net/conecte/referencias/Forman_1997a.pdf (Doc 49) pgs. 319-321

All-terrain vehicle travel can have a profound effect on all forms of wildlife.

- Concerns about the effect of off-highway travel on wildlife include: direct mortality, habitat fragmentation, and reductions in habitat patch size (the size of an unfragmented “patch” of land that supports at least one population of wildlife), increases in the edge: interior habitat ratio (reductions in animal populations at the edge of forest habitats referred to as the “edge effect”), and alteration of animal behavior.

Alteration of animal behavior resulting from disturbance (motorized or non-motorized)...result in three primary consequences: (Ref 5) pgs. 486-489

- Elevates metabolism at the cost of energy resources and reserves needed for the animal’s normal growth and reproductive potential.

- Can cause death, illness or reduced reproduction due to secondary effects from physical exertion and temporary confusion.
- Can lead to avoidance or abandonment of areas and to reduction in a population's range and, ultimately, to reductions of the populations due to loss of access to resources, increased predation or increased energy cost for existence.

Habitat fragmentation and displacement can alter natural behaviors such reproduction and impact access to prey/feeding grounds

Habitat fragmentation is widely regarded as a major threat to species diversity.

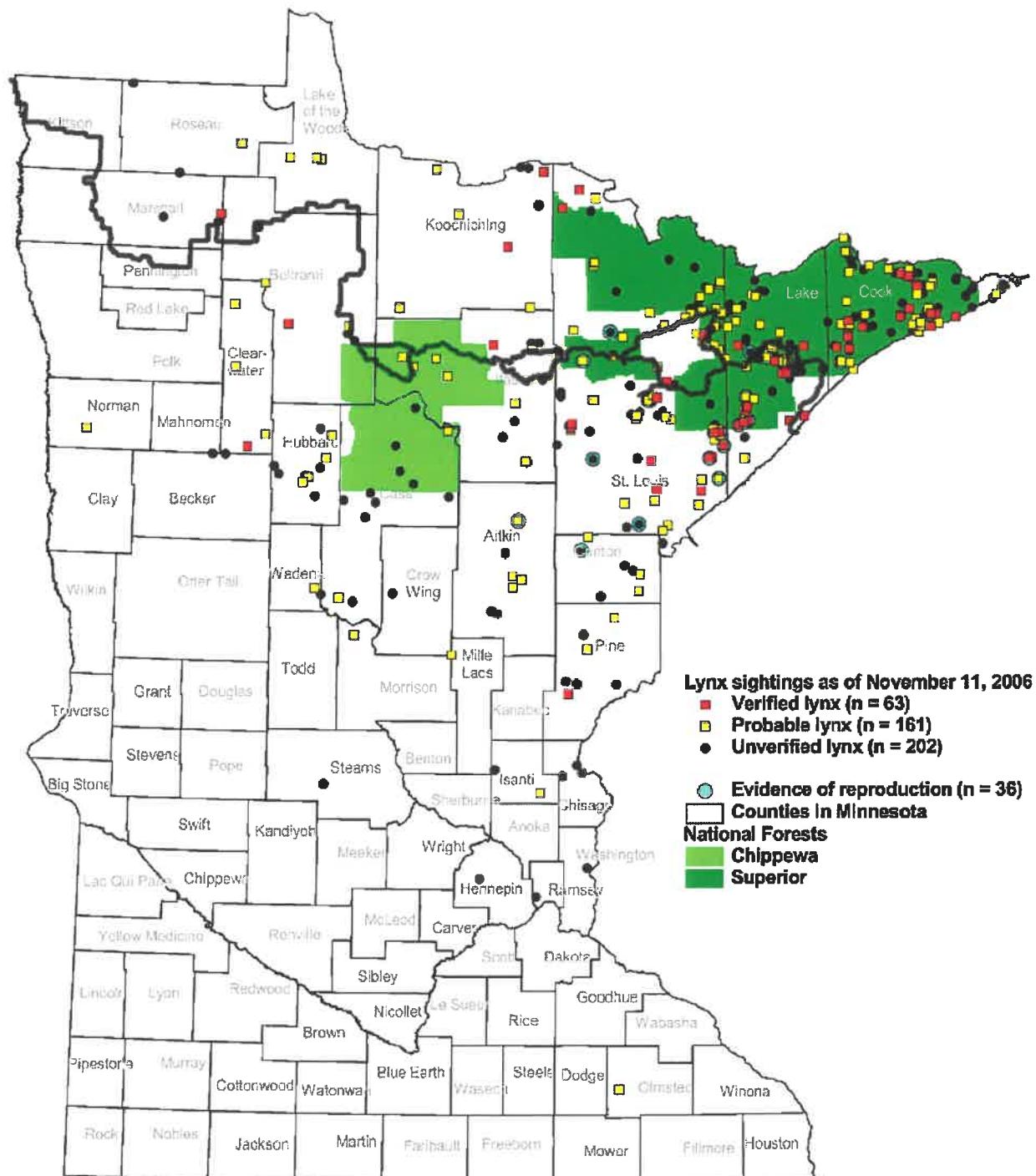
A good deal of research has also been done on the impact of trails and roads on the behavior patterns of wildlife, demonstrating that many wildlife species shift their home ranges or movement patterns in response to the presence of roads or trails, whether to avoid humans or to take advantage of travel corridors. These shifts have consequences for population dynamics and predator-prey relationships. Additionally, the introduction of exotic plant species, discussed above, can be damaging to native wildlife populations. All of these impacts are exacerbated if ATV users widen trails or create new trails.

(Ref 3) pg. 484-485

Impacts specific to Canada Lynx (“Lynx”)

The map on the following page documents Canada Lynx sightings along the proposed route overlay.

(map reference)



Cook County and Lake Counties have the highest lynx populations in Minnesota (Ref 11)
pgs. 506-08.

The Superior National Forest is the only National Forest in Minnesota with critical Lynx habitat, and it provides important habitat for lynx in the Lake States geographic area. (Ref 14) pgs. 523- 525 (Ref 9) pg.503

It has been estimated that at any given time the Lynx population in northeastern Minnesota ranges from 190-250 individuals. (Ref 13) pgs. 514-22. Because of the low population density, the lynx is a federally listed threatened species. (Ref 7) pgs. 491-495.

The entities responsible for lynx studies fiercely guard specific family locations to protect the species. For example, although the Natural Resources Research Institute (NRRI) still collects sightings information via phone and through a website, this information is no longer made available to the public. (Ref 14) pgs. 523-525

The entire section of proposed B2B route through Lake Counties falls within Lynx critical habitat (Ref 9) pg. 503

The proposed B2B route intersects known travel corridors (Ref 10) pg. 504 & (Ref14) pg. 525 and persistent family areas of the federally threatened Canadian lynx. (Ref 11) pgs. 506-508.

Effects to Lynx from exposure to additional traffic

The additional disturbance due to an increase in OHV traffic through lynx home ranges, and resulting behavioral changes, potentially jeopardizes their survival. Lynx require large areas containing boreal forest as habitat and their home ranges can extend up to 201 square miles. (Ref 13) pgs. 514- 522 & (Ref 14) pgs.523-525

In Minnesota, lynx regularly cross and travel along roads and other linear features. Most lynx deaths in Minnesota have been caused by human activities, including vehicle collisions, trapping, and shooting, and human presence is expected to be higher along a road. (Ref 12) pgs. 509-513 & (Ref 11) pgs. 506-508

The cat's survival in the U.S. is primarily jeopardized by habitat destruction and fragmentation. (Ref 15) pg. 52. Today most suitable lynx habitat in the West is on public land. This includes national and state forests, where logging and recreational development often occur. Roads threaten the lynx by fragmenting its habitat, isolating lynx populations, exposing them to predators, and providing competitor species new access to habitat formerly dominated by the lynx. For example, snowmobile traffic creates trails that may allow competitors like coyotes, wolves, and cougars access to lynx winter habitat. Motor vehicles also cause lynx mortality: "Attempts to reintroduce Canada lynx into New York's Adirondacks Mountains failed primarily because the cats were hit by cars and trucks.

<https://www.nwf.org/Educational-Resources/Wildlife-Guide/Mammals/Canada-Lynx>

(Ref 15 A)pgs.526 A-C

The map on the following page shows Canada lynx travel corridors with the proposed route overlay cutting across multiple travel corridors.

The map is titled the same as the research report:

Habitat and road use by Canada lynx making long-distance movements

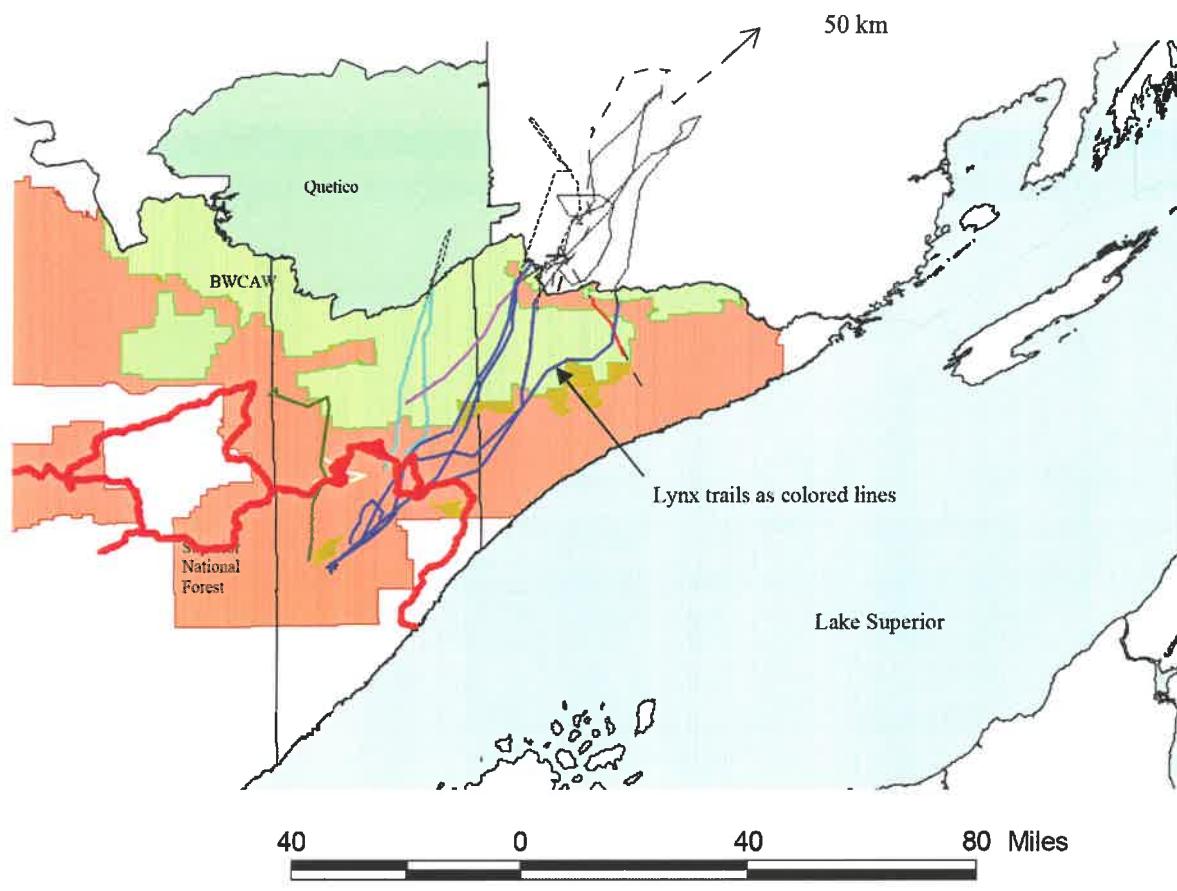
Ron Moen, Ph.D. and Lauren Terwilliger, M.A.

Center for Water and Environment Natural Resources Research Institute University of Minnesota
5013 Miller Trunk Hwy Duluth, MN 55811-1442

Alan R. Dohmen and Susan C. Catton

USDA Forest Service Superior National Forest 8901 Grand Avenue Place Duluth, MN 55808

<http://www.researchgate.net/publication/260318832>



- Lynx are naturally curious and their proximity to roads has been shown to decrease as traffic density increases (Ref 12) pgs.509-513
- The northeastern Minnesota landscape is characterized by thick dense forests, boggy openings and lakes of various sizes. Lynx may find that it is more energetically efficient to walk on or alongside of a road, whether within the home range or while on a long-distance movement. (Ref 14) pgs. 523-525
- Seasonal increase in OHV traffic occurs during lynx reproduction season. Female lynx habitat is closer to roads (Ref 12) pgs 509-513. Mating ends in April and females give birth 65 days later, which can be the end of June. During this time females are less mobile.
- Traffic deaths have occurred on a wide variety of roads with average daily traffic volume ranging from 19 to 19,400 vehicles per day (Ref 13) pg. 516
- Snowshoe hare densities may be higher along roads and trails due to the juxtaposition of land cover types and ages along these linear routes.... Therefore, road and trails appear to provide productive snowshoe hare edge habitat that lynx opportunistically utilize.

https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5351554.pdf

These factors make lynx even significantly more susceptible to death from the additional exposure to humans and traffic resulting from the national promotion of the B2B route, especially as awareness and use increases over time.

Other considerations

The Superior National Forest direction for managing endangered/threatened species generally, and specific to the Canada Lynx, include:

- Minimize the building or upgrading of roads in areas that are important for threatened and endangered species habitat and for habitat connectivity. (Ref 14A) pg. 525A
- Dirt and gravel roads that are under the jurisdiction of the National Forest and that traverse lynx habitat on NFS land (particularly those roads that could become highways) should generally not be paved or otherwise upgraded in a manner that is likely to lead to significant increases to lynx mortality or substantially impedes movement and dispersal. (Ref 14B) pg. 525 B
- Cross-country OHV travel is prohibited. (Ref 14B) pg. 525 B

What is the plan to monitor appropriate use of the trail and mitigate "cross county" use?

The LCAS (2000) describes that increasing human use of National Forests and human developments in lynx habitat both adjacent to and in mixed-ownership areas increase the potential for impacts to lynx and the species recovery.

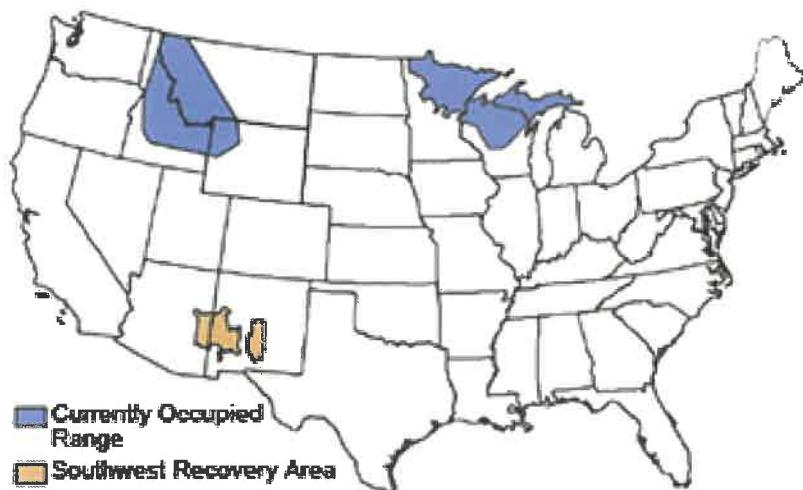
(Ref 14C) pgs. 525 C

Potential Indirect Effects include :

- Construction of new designated winter recreational trails, new designated trails, and policies that allow recreational vehicle uses on low standard roads or cross-country all facilitate access to historical lynx habitat by competitors (or predators).

- Increased human access from new trails or road-riding opportunities increases potential for incidental trapping or shooting.
- Increased planned access can facilitate increased access (generally on old closed or unclassified roads or cross-country) to areas previously that would have been as accessible. This would compound impacts of competitors or opportunities for incidental trapping or shooting. (Ref 14D) pg.525 D

The Gray Wolf



While gray wolves in the Southwest recovery area have struggled to establish viable populations, their cousins in the northern Rocky Mountains have fared much better, prompting the Fish and Wildlife Service to lift Endangered Species Act protections for wolves in Idaho and Montana. **Wolves in Wyoming and the Great Lakes region remain under federal protection.** Map courtesy of FWS. <https://www.eenews.net/stories/88861>

A map of known wolf pack locations with the proposed route overlay is on the following page.

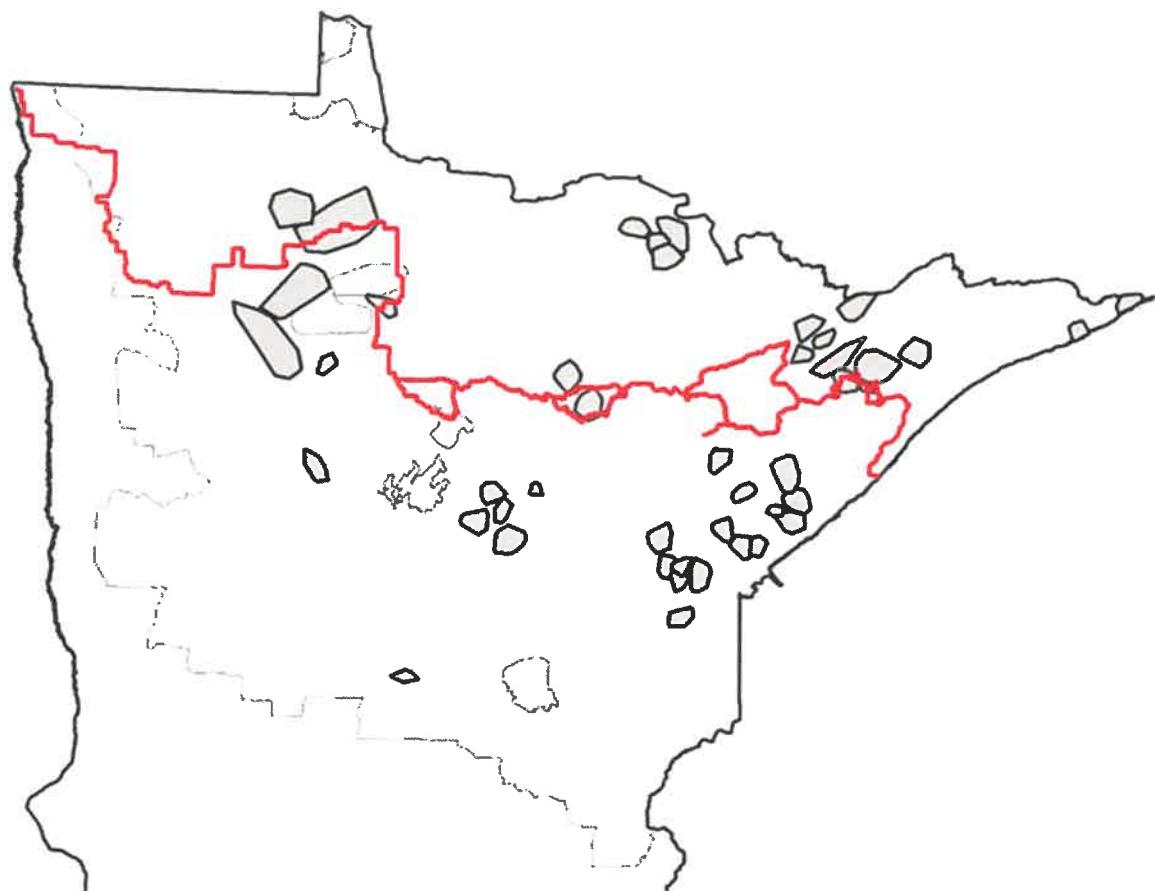


Figure 2. Location of radio-marked wolf packs in Minnesota from which data on territory and pack size were derived during the 2017-18 survey.

<https://files.dnr.state.mn.us/wildlife/wolves/2018/survey-wolf.pdf> pg. 6

DNR Commissioner Sarah Strommen's comments on 7/15/19 US Fish and Wildlife Proposed Rule:

"The Minnesota DNR reaffirms its commitment to gray wolf recovery. Without expressing an opinion on the status of gray wolves outside its borders, the Minnesota DNR recognizes that the recovery of gray wolves in Minnesota has been an over fifty-year process requiring the commitment of extensive federal, state, and tribal resources. Regardless of the outcome of this Proposed Rule, the Minnesota DNR intends to continue to manage Minnesota's wolf population to ensure the sustainability of our gray wolves now and in the future, consistent with our wildlife trust obligations. **The Minnesota DNR is further committed to managing its gray wolves to contribute to the success of wolf recovery beyond Minnesota.**"

Cumulative Effects:

<https://www.howlingforwolves.org/sites/default/files/Wolf+Analysis+Threats+To+Wolves.pdf> (Ref 17)
pgs.528-533

To assess cumulative effects, and future wolf habitat security, one must investigate the changing human demographics and how they may influence wolf habitat. Many factors in human demographics are changing at an alarming rate in Northern Minnesota. More people are spending more leisure time in Northern Minnesota than ever before. Pressures on natural resources are increasing, and public forests are receiving increased use from both permanent residents and seasonal recreationists.

The Eastern Timber Wolf Recovery Plan (USFWS, 1992) identified five critical factors for long-term survival of the species;1. large tracts of wild land with low human densities and minimal accessibility by humans, 2.ecologically sound management,3. availability of adequate prey, 4.adequate understanding of wolf ecology and management, and 5. maintenance of populations that are either free of, or resistant to new parasites and diseases.

Factors that are relevant to evaluation of effects of this project include 1 & 3 and indirectly 5. In addition, type of human use and activity in the area is a relevant factor for evaluation, as it influences the other factors.

There are three basic effects of increased human accessibility on wolf populations (USFWS, 1992). First, increased human presence increases the chances of deliberate and accidental killing of wolves. The types of human activity in an area, significantly influences this factor. In the Rice Lake Project Area, the majority of human use is related to hunting and other resource gathering, and recreational motor vehicle (RMV) and snowmobile operation.

These activity types tend to be the most detrimental to wolves because the activities tend to cover large acreages per hour of activity, and they may involve the pursuit and exploitation of wildlife. Wolves can be killed by hunters either deliberately or accidentally.

Secondly, increased human presence can deter wolves from inhabiting an area. Human presence is magnified if it involves motorized vehicles because the amount of area covered in an hour of activity with a motorized vehicle is exponentially greater than that of an hour without a motorized vehicle. In addition, noise and smell created by motorized vehicles tends to increase the zone of influence significantly at any one time. Human activity tends to create an avoidance response.

This interferes with necessary life support activities such as hunting, breeding and parturition and causes wolves to spend energy for avoidance rather than for these living requirements.

The Chippewa National Forest Wolf Management plan states: "The standards and guidelines for the gray wolf are based on the guidelines in the Eastern Timber Wolf Recovery Plan. The Recovery Plan states that "the more access provided to wolf range, the more detriment there will be to wolves". Also, "the higher grade (standard) the road is, the more access it will provide". However, the Recovery Plan also states that **"An open, low standard woods road may have greater potential human impact on wolves than a national forest highway"**. So, when considering human access and road densities, one should consider all roads and trails, not just higher standard roads.

To assess cumulative effects, and future wolf habitat security, one must investigate the changing human demographics and how they may influence wolf habitat. Many factors in human demographics are changing at an alarming rate in Northern Minnesota.

Traffic volumes on regional highways are growing exponentially, resulting in highway upgrades, which with the increased traffic are likely to cause movement barriers and fragmentation of wolf habitat. Pressures on natural resources are increasing, and public forests are receiving increased use from both permanent residents and seasonal recreationists. ATV numbers have increased by 431% between 1990 and 2000. Snowmobiles show a 46% increase.

Motorized activity in Minnesota's forests has grown significantly, particularly since 1990. In previous decades, logging roads and trails would gradually become inaccessible as they re-vegetated and became obstructed with brush and debris.

This resulted in a relatively static road and trail density as new roads and trails were constructed and older ones became impassable. Today, almost all new roads and trails are maintained in a passable condition by four-wheel drive trucks and ATV traffic, creating a condition where newly constructed and reconstructed roads and trails result in a permanent increase in road and trail density. This is a compounding factor with the increasing number of ATVs and snowmobiles, and the increasing hours of use per vehicle.

Unless remote wildland areas are managed as habitat for large mammals such as the wolf, Minnesota will likely experience a degradation of habitat capable of providing long-term survival of such species.

<https://www.howlingforwolves.org/sites/default/files/Wolf+Analysis+Threats+To+Wolves.pdf>

U.S. Forest Service. 1986. Land and Resource Management Plan, Chippewa National Forest. United States Department of Agriculture, Forest Service, Eastern Region.

The Mn DNR states:

The DNR is committed to a responsible, conservative and science-based management strategy that ensures the long-term survival of wolves in Minnesota recognizes the animal's legacy and Minnesotans' collective interest in and concern for this northwoods icon.

<https://www.dnr.state.mn.us/mammals/wolves/mgmt.html> (Ref16) pg. 527

The Wood Turtle

This late maturing species has low recruitment potential and is highly vulnerable to the loss of any individuals from the population. Conservation efforts should include identification of viable wood turtle populations and the protection of upland foraging habitat and nesting sites.

Activities affecting water quality and water level management must also be addressed.

Many adults die when crossing roads between fragmented patches of suitable habitat. Preservation of high-quality wood turtle habitat is dependent upon reasonable floodplain conservation techniques and zoning restrictions, including maintaining water quality; controlling sedimentation; restricting pesticide use near waterways; enforcing minimum setback requirements and stream-side buffer zones.

<https://www.dnr.state.mn.us/rsg/profile.html?action=elementDetail&selectedElement=ARAAD02020#> (Ref 23) pgs. 544-45

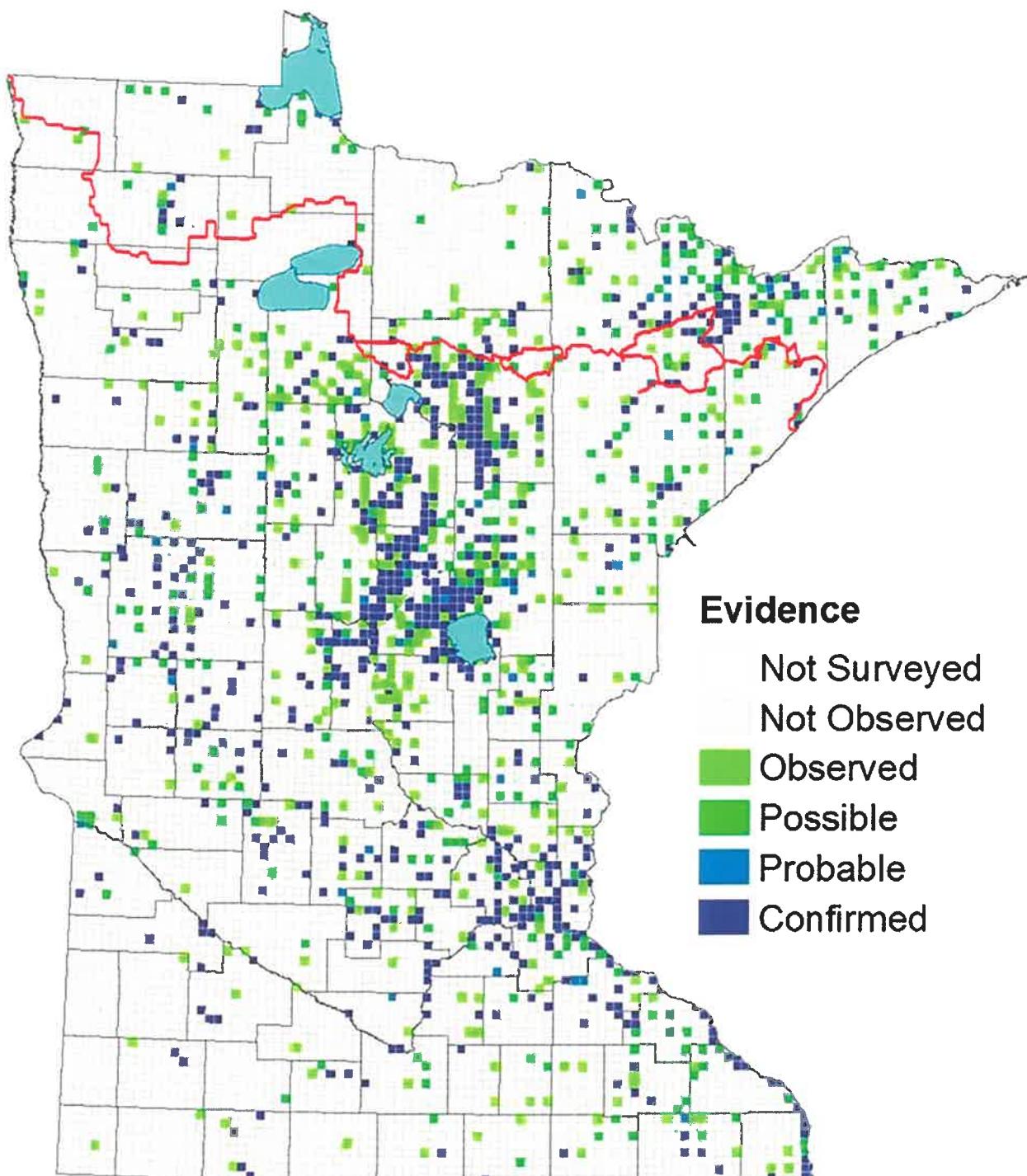
https://www.dnr.state.mn.us/eco/nongame/projects/wood_surveys.html

AMERICAN BALD EAGLE

Human disturbance near a nest site may cause eagles to abandon their nests or leave the young to vulnerable to severe weather or predators. Therefore it is necessary to protect breeding areas during the breeding and nesting season. Young eagles begin to fly late May through early July and 4 weeks after they have learned to fly, which could be in the late June to August time period, they leave the nest for good.

<https://www.dnr.state.mn.us/birds/eagles/summer.html> (Ref 25)pg. 554

The map on the following page shows areas of confirmed Bald Eagle evidence with the proposed route overlay showing where the proposed route would traverse and intersect these areas.



[Bald Eagle](#) (*Haliaeetus leucocephalus*) Evidence

<https://mnbirdatlas.org/>

Bald eagles exhibit high nest site fidelity and nesting territories are often used year after year. Some territories are known to have been used continually for over half a century.

If agitated by human activities, eagles may inadequately construct or repair their nest, may expend energy defending the nest rather than tending to their young, or may abandon the nest altogether. Activities that cause prolonged absences of adults from their nests can jeopardize eggs or young. Depending on weather conditions, eggs may overheat or cool too much and fail to hatch. Unattended eggs and nestlings are subject to predation. Young nestlings are particularly vulnerable because they rely on their parents to provide warmth or shade, without which they may die as a result of hypothermia or heat stress. If food delivery schedules are interrupted, the young may not develop healthy plumage, which can affect their survival. In addition, adults startled while incubating or brooding young may damage eggs or injure their young as they abruptly leave the nest. Older nestlings no longer require constant attention from the adults, but they may be startled by loud or intrusive human activities and prematurely jump from the nest before they are able to fly or care for themselves. Once fledged, juveniles range up to 1/4 mile from the nest site, often to a site with minimal human activity. During this period, until about six weeks after departure from the nest, the juveniles still depend on the adults to feed them.

Existing Uses

Eagles are unlikely to be disturbed by routine use of roads, homes, and other facilities where such use pre-dates the eagles' successful nesting activity in a given area. Therefore, in most cases ongoing existing uses may proceed with the same intensity with little risk of disturbing bald eagles. However, some intermittent, occasional, or irregular uses that pre-date eagle nesting in an area may disturb bald eagles. For example: a pair of eagles may begin nesting in an area and subsequently be disturbed by activities associated with an annual outdoor flea market, even though the flea market has been held annually at the same location. In such situations, human activity should be adjusted or relocated to minimize potential impacts on the nesting pair.

Temporary Impacts

For activities that have temporary impacts, such as the use of loud machinery, fireworks displays, or summer boating activities, we recommend seasonal restrictions. These types of activities can generally be carried out outside of the breeding season without causing disturbance.

If the activity you plan to undertake is not specifically addressed in these guidelines, follow the recommendations for the most similar activity addressed, or contact your local U.S. Fish and Wildlife Service Field Office for additional guidance.

Category D. Off-road vehicle use (including snowmobiles). No buffer is necessary around nest sites outside the breeding season, which starts with nesting in December and ends with Fledging Young through August.

During the

breeding season, do not operate off-road vehicles within 330 feet of the nest. In open areas, where there is increased visibility and exposure to noise, this distance should be extended to 660 feet.

<https://www.fws.gov/southdakotafieldoffice/NationalBaldEagleManagementGuidelines.pdf>,
(Ref 26) pgs. 555-568

The RUSTY PATCH BUMBLE BEE

Once common and abundant across 28 states from Connecticut to South Dakota, the District of Columbia and two Canadian provinces, the rusty patched bumble bee has experienced a swift and dramatic decline since the late 1990s. Abundance of the rusty patched bumble bee has plummeted, leaving only a few small, scattered populations in 9 states and one province.

Threats to the rusty patched bumble bee include disease (for example, from infected commercial honeybee colonies), exposure to pesticides, habitat loss, the effects of climate change, the effects of extremely small populations, and a combination of these factors.

This species has been observed or collected from woodlands, marshes, agricultural landscapes, and, more recently from residential parks and gardens.

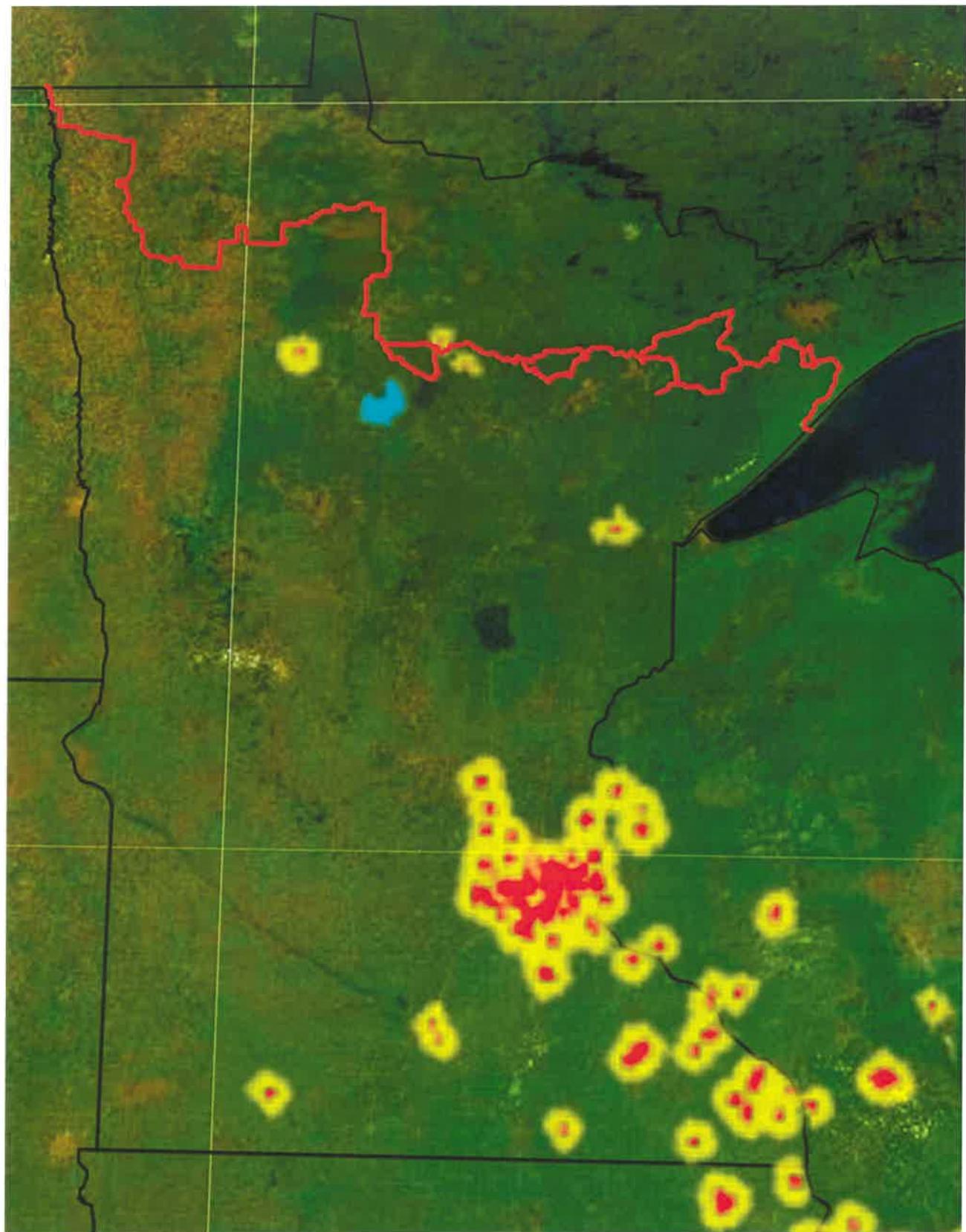
<https://www.fws.gov/midwest/Endangered/insects/rpbb/archives.html>

Map of Rusty Patch Bumble Bee locations in Minnesota with the proposed route overlay is on the following page. The proposed route traverses two areas where it is to be assumed rusty patch bumble bees are present, with the recommendation of surveys to verify presence.

<https://www.fws.gov/midwest/Endangered/insects/rpbb/rpbbmap.html>

Red Areas = High Potential Zones: rusty patched bumble bee likely present

- Assume rusty patched bumble bees are present where suitable habitat is present. Additional surveys can be done to verify presence or absence.
- If my project is in this zone, what do I do? Go back to the Rusty Patched Bumble Bee home page and follow the link for your specific situation.
 - Section 7 consultation or an Incidental Take Permit may be necessary if your project or action may harm or kill rusty patched bumble bees.
 - We recommend recovery permits for surveys and non-lethal survey techniques



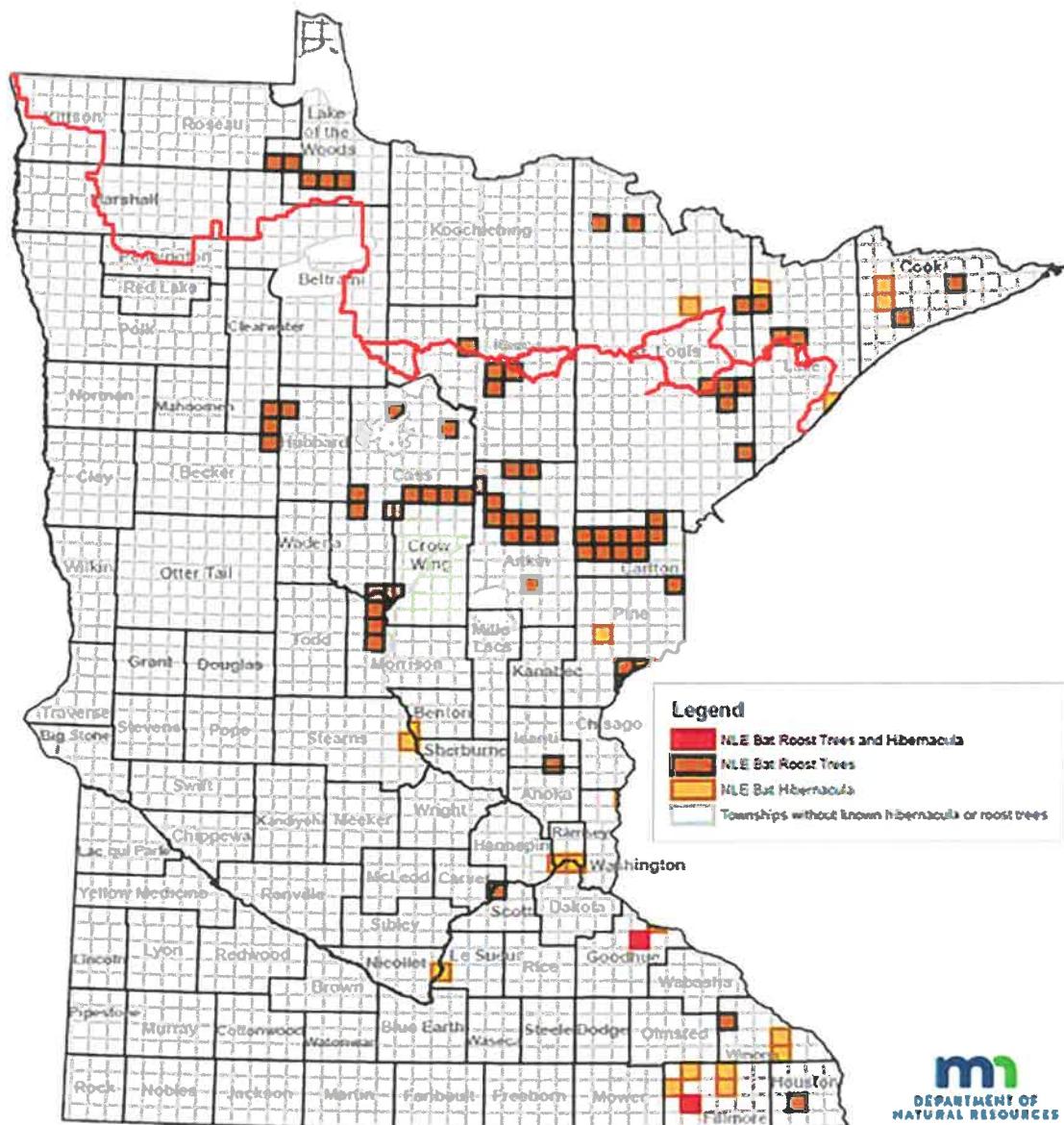
Understanding what constitutes destruction of critical habitat is necessary for the protection and management of critical habitat. Destruction is determined on a case-by-case basis. Destruction would result if part of the critical habitat were degraded, either permanently or temporarily, such that it would not serve its function when needed by the species. Destruction may result from a single activity or multiple activities at one point in time or from the cumulative effects of one or more activities over time. Critical habitat for the Rusty-patched Bumble Bee may be destroyed by any alteration that adversely modifies any biological, chemical or physical feature to the extent that individuals can no longer use their environment for one of their life processes, such as overwintering, nesting or foraging. **Within the critical habitat boundaries, activities that could ultimately alter the structure and composition of open habitats where suitable flowering plant species are available can destroy Rusty-patched Bumble Bee critical habitat.**

https://www.registrelep-sararegistry.gc.ca/virtual_sara/files/plans/rs_rusty_patched_bumble_bee_e_proposed.pdf_pg_
(Ref 30 B) pg. 577

NORTHERN LONG EARED BAT

See the Mn map dated 6/3/20 on the next page for the proposed route overlay on the northern long eared bat (NLEB) roosting trees identified. The proposed route traverses directly through these documented sites of roost trees in several counties.

**TOWNSHIPS CONTAINING DOCUMENTED NORTHERN LONG-EARED BAT
MATERNITY ROOST TREES AND/OR HIBERNACULA ENTRANCES**



CONCLUSION:

The proposed route would increase high impact traffic on historically low volume traffic roads that traverse known travel corridors and habitat areas of endangered or threatened species of the Canada lynx, gray wolf, wood turtle, rusty patch bumble bee and the northern long eared bat, as well as the federally protected American Bald Eagle; all evidenced by the proposed route overlay maps of the individual species range and geographic location maps. Given such evidence, we find the proposer should review re-routing these portions of the route to avoid *any* potential negative impacts to these species for purely recreational purposes.

IMPACT OF THE PROPOSED ROUTE ON VISITORS TO THE BWC AW; ENVIRONMENTAL IMPACT OF BORDER TO BORDER ROUTE TRAFFIC TO BOUNDARY WATERS ENTRY POINTS

In December, 2008 the Superior National Forest completed an Environmental Assessment (E.A.) of the Forest-Wide Travel Management Project. As stated in the Introduction, "The purpose of the Forest-wide Travel Management Project is to determine which roads and trails on the Superior National Forest are to be available for public motorized use, including highway vehicles(licensed cars and trucks), all terrain vehicles (ATVs), off-highway motorcycles (OHMs), and unlicensed off road-vehicles (class 2 ATVs and non-highway legal 4 wheel drive vehicles)." (section 1-1).

The 2008 E.A. Was limited to considering the environmental impact of different amounts of road and trail designations and allowable motorized uses to be implemented (section 2-2). Although the 2008 E.A acknowledged a trend of significant increased motorized recreation in the Superior National Forest, it did not address the environmental impact of this increase. The 2008 Superior National Forest Environmental Assessment preceded the initiation of the proposed Border to Border Route, project so its specific and unique environmental impacts were not assessed.

The E. A. did consider OHV noise impacts to the wilderness character of the Boundary Waters. The USDA Forest Service has developed guidelines and methods for wilderness monitoring: "Outstanding opportunities for solitude or a primitive and unconfined type of recreation" directly relates to how OHV noise could affect opportunities for solitude provided by and expected in a wilderness setting (section 3.9.2). The intrusion of OHV noise into the Boundary Waters could significantly detract from the "wilderness character" experience for a Boundary Waters visitor.

The E.A. considered 2 factors:

"Indicator 1: Number of BWC AW routes (lakes and river) and campsites within one mile of roads."

"Indicator 2: Miles of road and trail open to OHVs within one mile of BWC AW camp sites or trails open to OHVs." (section 3.9.3).

"Conclusion: Conclusions drawn from a Glacier Project Environmental Impact Statement reference (USDA Forest Service, Glacier IDT Meeting on Sound Effects to the BWCAW, November 13, 2007), determined that sounds from outside the BWCAW can be heard for at least a short distance inside the wilderness on a regular basis. Common sounds include motorboats, road use, private development, and logging and mining activity. In addition, aircraft activity including Forest Service planes conducting fire patrols, search and rescue flights and wildlife surveys, as well as private aircraft and high altitude jets can all generate noise heard in the BWCAW. Based on the Glacier reference above and the analysis in section 3.9 of this EA, it is unlikely that any of the alternatives considered in Travel Management for roads open to OHVs would cause noise of a different type or quality, nor would the noise be more constant or frequent, than what already exists on public and private roads adjacent to the wilderness boundary (section 3.9.7).

THE 2008 study did not take into account or review the potential effects and impacts of the increased traffic from a designated route for highway licensed OHVs that would be advertised nationally, mapped and signed.

The impact of the noise generated from the proposed Border to Border Route on the "Wilderness Character" of the Boundary Waters could be different and significant in the following ways from the impacts addressed in the 2008 Environmental Assessment:

1. **MORE FREQUENT NOISE:** A substantial increase in vehicle traffic due to the fact that this would be a designated route, nationally promoted on websites and road club sites across the country, signed and mapped, has the potential to generate significantly more noise and more "frequent" than indicated in the 2008 E.A. Conclusion.
2. **NOISE OF A DIFFERENT TYPE OR QUALITY:** Noise generated by large numbers of OHV Club vehicles traveling together would be "different" in "type" and "quality" than indicated in the 2008 E.A. The popular Jeep Jamboree USA events average 100 vehicles with 500 passengers per event.
3. **PROXIMITY TO THE BOUNDARY WATERS:** At its closest point, the intersection of F S 377 and F S 373, the proposed Route is within one and one quarter miles of the Boundary Waters. And, for several miles the Route runs roughly parallel within one to two miles of the Boundary Waters.

4. BORDER TO BORDR ROUTE TRAFFIC TO AND AT BOUNDARY WATERS ENTRY POINTS: Border to Border Route traffic may deviate from the Route on to mostly dead end roads leading to Boundary Waters Entry Points (See pgs. 92-94, Boundary Waters Entry Points 84, 75, 67, 34, 86, and 35 on the Superior National Forest maps). For a variety of reasons, Border to Border traffic may choose to use or explore the roads leading to these Entry Points. For example, given the lack of facilities along this section of the proposed Route, Border to Border Route drivers may travel to Entry Points to use the toilets. These Entry points are right at the Boundary Waters' edge and Border to Border Route traffic would bring more frequent vehicle noise much closer than the 1 mile "Indicator" criterion used in the E.A.

5. USER CONFLICT AT BOUNDARY WATERS ENTRY POINTS: Impact and user conflicts at Boundary Waters Entry Points was also not addressed in the 2008 E.A. Entry Points typically consist of a landing at water's edge, a small parking area to accommodate the vehicles of canoeists, and a pit toilet. The primary purpose of Entry Points are to accommodate canoeists on their Boundary Waters trips. The Entry Point facilities are scaled in size for the amount of canoeist vehicle traffic at a particular Entry Point based on the quota permit reservation system (1 to 2 canoe groups per day at the Entry points along the Route).

Increased vehicle traffic, especially OHV Clubs with high numbers of vehicles would overwhelm the facilities at the Entry Points and precipitate user conflicts with canoeists and possibly damage the facilities and surrounding vegetation. Vehicle congestion would interfere with canoeists attempting to reach the water access/landing to load and unload canoes and equipment. Because the 2008 E.A. preceded the Border to Border Route project proposal, this potential user conflict and environmental impact was not considered.

6. DEGRADATION OF WATER QUALITY: As indicated in this Petition increased traffic particularly on low standard unmaintained roads results in increased erosion & subsequent sedimentation and degradation of water quality, impacting aquatic habitat and survival. Given the closeness to the Boundary Waters of these Entry Points and Entry Point roads, there is potential for degradation of the Boundary Waters. Because the 2008 E.A. preceded the Border to Border Route project proposal, this potential user conflict and environmental impact was not considered.

7. NONNATIVE INVASIVE SPECIES: The risks of spread of nonnative invasive species from a continuous long distance Route is addressed in other sections of this Petition. The added concern is that Border to Border Route to Boundary Waters Entry Points could potentially transport and shed nonnative invasive species virtually to the edge of the Boundary Waters. Because the 2008 E.A. preceded the Border to Border Route project proposal, this potential environmental impact was not considered.

U.S. FISH AND WILDLIFE CONCERNS The United States Department of the Interior Fish and Wildlife Service in its March 6, 2017 letter expressed concern for User conflicts resulting from the proposed Route: "While the Service is very supportive of opportunities to promote outdoor recreation, the potential for the proposed project to conflict with priority recreational uses on National Wildlife Refuge lands appears plausible and may even detract from or negatively impact recreational opportunities for the visiting public. Careful planning and foresight will be imperative in order to avoid potential conflicts." "...designation of a trail has the potential to increase visitor conflicts by substantially increasing traffic and consolidating travelers into larger packs or caravans." (Doc 6) pg. 231

The mention in the letter for the potential of "the proposed project to conflict with priority recreational uses" reinforces the concern that Border to Border traffic at Boundary Waters Entry Points would conflict with "priority recreational uses" for canoe trips which are the intended use of these facilities.

CONCLUSION:

An Environmental Assessment is needed to address the potential impact of user conflicts and noise impact on Boundary Waters visitors as a result of the proposed Route. Also needed is a component of the E.A. to address the environmental impact of Border to Border Route traffic On Boundary Waters Entry Point roads and at Boundary Waters Entry Point.

Management and Enforcement issues and User Conflict Aspects of the Proposed B2B Route

There is no question that staying on trail or road is less environmentally damaging in comparison to off trail/off road riding. However, this position ignores the reality and research that even so called “Responsible” OHV motorized recreation has inherently significant environmental impacts and user conflict impacts. Mislabeling a high impact activity as “treading lightly” “low impact,” and “responsible use” does not negate its impact.

Research on Illegal/Rule Breaking OHV Activity

The following research demonstrates the extent and severity of illegal/rule breaking OHV rider activity, its environmental impacts and User Conflicts.

“The Forest Service and Bureau of Land Management together control over 446 million acres of land with an estimated 14,000 miles of unofficial trails created by ORV users.” (MINIMIZATION CRITERIA FOR OFF-ROAD VEHICLE USE (on Federal Lands-page 261 on Minimization report)

<https://repository.law.umich.edu/cgi/viewcontent.cgi?article=1047&context=mjreal>

Just a Few Bad Apples: Research Shows Many Off-Roaders Break the Law

https://www.biologicaldiversity.org/programs/public_lands/off-road_vehicles/travel-management_planning/pdfs/Appendix_N_Kiely_Kassar_2007_Few_bad_apples.pdf

Editor’s Note: Bibliography Notes typically covers the ecological effects of roads or ORVs by reviewing scientific literature. However, assumptions about social behavior also influence the debate around the management of off-road vehicle use on public lands. This edition of Bibliography Notes explores one important social science issue that has been studied by researchers.

Introduction

The ecological impacts of off-road vehicles on water, air and land have been well documented. In the past five to ten years, however, these issues have taken on social dimensions, and social scientists have begun exploring the attitudes and behaviors of off-road vehicle drivers.

Countless newspaper articles are peppered with myths perpetuated by off-roaders, such as: “elite environmentalists are locking the public out of public lands;” “the old and infirm need vehicles to explore the forest;” “if you give folks a place to ride their ATVs, they won’t break the rules;” and “it’s just a few bad apples riding where they’re not supposed to and causing damage.”

This article examines important social science research that debunks the “few bad apples” myth. Analysis includes a review of three state-level surveys revealing that a majority of off-roaders break the law. These studies point to the failure of this myth and show a pronounced preference and practice among off-road vehicle recreationists to travel cross-country and ride off of legal routes.

Montana

In 2006, Montana Fish, Wildlife and Parks received survey responses from 446 owners of registered off-road vehicles. Among the full sample of respondents, 23% “always or sometimes” ride cross-country even though off-route riding is against the rules in Montana and has been since 2001. Over 28% “sometimes or never” avoid riparian areas and wetlands, in violation of rules for federal and state public lands in Montana.

64 % of those surveyed have used an off-road vehicle while hunting. The majority of this hunting subset admits to riding cross-country — over 58% have traveled off of legal routes to retrieve downed game.

Colorado

A 2001 Colorado study cited the state of Montana’s off-road vehicle public education program as a model to emulate. According to the Colorado study, Montana’s “On the Right Trail” program “provided a list of key behavioral traits that define an ‘ethical hunter’ — with several of these related to proper OHV use.” However, as discussed above, the more recent Montana study revealed a significant disregard for the rules among many off-road vehicle riders, pointing to the ineffectiveness of the state’s education program.

This supports the key conclusion of the Colorado study: *“information and education per se – will not result in substantial behavioral change” (emphases in original).*

Monaghan and Associates, a marketing research firm, conducted the 2001 study at the behest of the Colorado Coalition for Responsible OHV Riding, a coalition of off-road vehicle representatives, environmentalists and public officials. Researchers surveyed Colorado off-road vehicle riders through a series of three focus groups.

Monaghan and Associates found that the majority of off-roaders understand that staying on designated routes is “fundamental trail etiquette” and that going off trail is not “correct” off-road vehicle behavior. The survey revealed, however, that regardless of this knowledge “as many as two- thirds of adult users go off the trail occasionally.” A significant percentage of riders, 15-20%, admitted to frequently breaking the rules and riding off of legal routes often. Survey participants also stated that “others” ride off-route and cause most of the damage.

Utah

In a separate study, the Utah Division of Parks & Recreation commissioned Utah State University to survey riders to determine their “OHV uses and owner preferences.” The university conducted a telephone survey of 335 riders from a random sample of the 50,676 people who registered off-road vehicles with the state in 2000.

The Utah report reveals that a high percentage of riders prefer to ride “off established trails” and did so on their last outing. Of the ATV riders surveyed, 49.4% prefer to ride off established trails, while 39% did so on their most recent excursion. Of the dirt bike riders surveyed, 38.1% prefer to ride off established trails, while 50% rode off established trails on their most recent excursion.

When surveyed on issues affecting off-road vehicle use in Utah, survey respondents recognized the need for enforcement but not the need for protecting the natural resources where they ride. This questions the assumption that off-road vehicle riders will stay on-route if educated that cross- country travel is illegal or damaging. **One-third of the respondents said there should be more law enforcement presence in OHV areas. Only 6% cited “resource management conservation” as the most important issue affecting off-road vehicle use in Utah.**

Nevada

The U.S. Fish and Wildlife Service found a near universal disregard for motorized guidelines when the BLM experimented with a “voluntary off-road vehicle route system” in Nevada. The area in question serves as a refuge for the disappearing Sand Mountain Blue butterfly, a species proposed for listing under the Endangered Species Act. A 2006 monitoring report compiled over a three-year period found that “98 percent of all existing routes continued to be used and new routes were created, indicating an ongoing expansion of habitat degradation.”

The study also found that half of the places where riders violated guidelines were near signs that discouraged them from proceeding into sensitive butterfly habitat. The cumulative impacts of such “noncompliance points” were four- fold as each discouraged route experienced multiple incursions.

Conclusion

One can assume that many folks will not tell the truth when asked if they participated in a behavior known to be illegal or generally perceived to be in conflict with social norms. This tendency is known as the “social desirability bias” and defined as under-reporting undesirable attributes and/or over-reporting desirable attributes due to the tendency to present oneself in a favorable light.

(Groves et. al. 2004). Therefore, the percentage of off-roaders who violate the rules is likely even higher than revealed in the survey results discussed above.

Many public land managers mistakenly continue to assume that designating additional off-road vehicle routes will lead directly to greater compliance, less cross-country travel and, as a result, less resource damage and fewer conflicts among incompatible uses. Some believe that off-road vehicle riders will quit creating renegade routes once more routes are designated “open” and riders are educated as to where they are and are not allowed to ride.

In contrast, the research above shatters the myth that damage and conflicts are being caused by an insignificant percentage of off-road vehicle riders. The findings of these studies suggest that even if the “demand” for more off-road vehicle riding opportunities is met, riders will continue to fulfill their preferences by riding off legal routes. The surveys also conclude that education and information alone are not effective strategies for changing off-road behavior.

Instead, Monaghan and Associates offers the following recommendation: “In order to be successful and actually influence behavior, OHV users must be motivated to behave properly.”

While more social science research is needed to determine what will motivate users to behave properly, anecdotal research (Archie et al. 2007) argues most strongly for increasing enforcement, and especially increasing the consequences for breaking the law, through mechanisms like vehicle confiscations, increased fines, and closing areas to all motorized users when motorized trespass occurs.

References

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Nevada Fish and Wildlife Office, U.S. Fish and Wildlife Service. 2007. 12-Month Finding on a Petition to List the Sand Mountain Blue Butterfly (*Euphilotes pallescens* ssp. *arenamontana*) as Threatened or Endangered with Critical Habitat. Federal Register, Vol. 72, No. 84. See pages 24260-61.
<http://www.wildlandscpr.org/denial-petition-list-sand-mountain-blue-butt...> [5].

A study in Georgia documented that of the 59 routes surveyed in the Chattahoochee NF, illegal ORV use occurred on 67 %, including designated wilderness and trails restricted to pedestrians.

Another study conducted in Colorado on behalf of Colorado Coalition for Responsible ORV Riding found that despite the fact that enthusiasts understood that they should not stray from designated trails, more than two-thirds admitted they go off-trail occasionally, and 15-20% admitted they regularly rode off legal routes.” (<https://www.stopthrillcraft.org/culture.htm>, (click on “Thrillcraft Culture” upper left of homepage))

The following material is from Environmental Effects of Off-Highway Vehicles on Bureau of Land Management Lands

(<https://pubs.usgs.gov/of/2007/1353/report.pdf>

Pages 33-42 of the government publication

2.7 Socioeconomic Implications of OHV Use 2.7.1 Section Summary

The socioeconomics of OHV use include OHV user demands, concerns, and attitudes; the economic effects of OHV use on communities near OHV-use areas; the economics of managing OHV activities; the effects of OHV use on non-motorized recreators; and the economics of losing ecosystem services. Although not currently addressed through BLM's indicators of rangeland health, natural resource attributes are heavily influenced by socioeconomic factors. Since the mid 1980s, the incidence of OHV use on public lands has increased substantially, and this trend is expected to continue.

Moreover, the economic benefits from travel expenditures and the sales of supplies and equipment in communities bordering OHV-use areas generates significant pressure to maintain or increase current levels of OHV activity.

As OHV activity increases, however, increasing stress is placed on natural resources, land managers who must monitor and regulate OHV activities, and visitors seeking non-motorized forms of recreation

2.7.2 Trends in OHV Use and Technology

In a survey of Utah OHV users commissioned by the Utah Department of Natural Resources, Fisher and others (2001) found that public lands are primary destinations among most users; only one quarter of survey respondents took trips to private land. More specifically, BLM land was the primary destination for ATV, motorcycle, and 4 x 4 vehicle users;

U.S. Forest Service land was the secondary destination among ATV and 4 x 4 users; and State land was the secondary destination among motorcycle users (Fisher and others, 2001).

Increasing OHV use is likely to be accompanied by greater demand for places where OHVs can be used, particularly near urban areas and corridors; as urban populations increase, so do the numbers of

recreators on nearby public lands, thereby putting more stress on the landscape (Brooks and Champ, 2006).

The increasing demands also pose problems for land managers already balancing the needs of a dynamic land base, often with limited budgets and/or staffing (Brooks and Champ, 2006; Rocky Mountain Research Institute, 2002). These limitations constrain land managers but not OHV use; thus, OHV recreation is largely “unmanaged.”

In addition, technology advancements in outdoor recreation equipment have led to production of OHVs that easily access lands previously unimpacted by mechanized recreation (Meine, 1998; Ewert and Shultis, 1999). As a result, new problems have arisen for both previously unimpacted areas and backcountry users who now encounter OHVs. Problems potentially arising from a constrained ability to manage lands include resource degradation, displacement of wildlife, and conflict among users, both within and across user types.

2.7.3 Types, Sources, and Effects of OHV User Conflict

Much of the OHV literature addresses conflicts between OHV users and other land users, even those who are not directly affected by OHV users. Researchers have addressed conflict issues by using a variety of tools or models designed to help managers understand and reduce conflicts between or among user groups.

Bury and others (1983, p. 401) describe conflict as existing “whenever incompatible activities occur” and offer three elements that contribute to the incompatibility of activities: spatial and temporal proximity, dominance over the environment, and dependence on technology.

When the proximity of activities does not result in direct or indirect (seeing the effects of other uses) encounters among user types, then environmental dominance and technological dependence are more likely to come into play. Dominance over the environment refers to how much an individual feels the need to exert some kind of control over the environment. Dependence on technology can cause conflict when people who retreat to backcountry to seek solace from modern technology clash with those who use technology to enhance their outdoor experiences. Conflict also occurs between land users and land managers. Inconsistent management policies across different land management agencies can cause such conflict, particularly as OHV recreation is ushered from being “unmanaged” to “managed.” On

many public lands, trails are currently considered open unless posted as closed, and once a trail has been established by users, it is often considered open for use (Brooks and Champ, 2006).

Graefe and Thapa (2004) outline some of the traditional approaches to examining user conflicts through research, including studies of goal interference (first introduced by Jacob and Shreyer, 1980). Goal interference occurs when a user comes into direct (seeing the conflicting recreation type) or indirect (seeing the *effects* of a recreation type) contact with another user type and is impeded from accomplishing the desired purpose of his or her recreation (Badaracco, 1976). The factors that contribute to goal interference are activity style, resource specificity, mode of experience (whether individuals are focused or unfocused), and tolerance for lifestyle diversity. Another model classifies conflict as either interpersonal conflict or a conflict of social values (Vaske and others, 1995). Interpersonal conflict is similar to goal interference in that a user has a problem with another use type and encounters an individual participating in, or evidence of, that type (hearing OHV noise, for example). Social values conflict occurs regardless of whether or not differing user types encounter one another—just knowing that the other recreation type is permitted may be unacceptable.

In the literature on user conflict, conflict is more often characterized as one-sided than two-sided (Badaracco, 1976; Bury and others, 1983; Watson and others, 1997; Graefe and Thapa, 2004). For example, while backpackers may perceive OHV users as disruptive to their experience, it is less likely that OHV users will find backpackers disruptive to their experience (Jackson and Wong, 1982). Displacement is the most common personal coping mechanism by which conflict is abated (Watson et al, 1997; Graefe and Thapa, 2004).

That is, if an individual feels negatively enough about certain recreational activities occurring in the area he/she wishes to use, there is a possibility that the individual will simply forgo recreating in the area altogether, thereby increasing the probability that area managers will gradually lose support from that user base (Watson and others, 1997; Graefe and Thapa, 2004).

2.7.4 OHV Users and Their Preferences

Overall, understanding the social effects of OHV use requires understanding the full array of recreational activities sought and the preferences of both OHV and non-OHV users alike. For example, people engaged in camping may include both OHV and non-OHV users, which can result in dissatisfaction among campers. In a survey of campers that included both OHV and non-OHV users, 66 percent indicated that having a regulated OHV riding area nearby would make their stay more enjoyable because it would reduce the number of riders in other areas and maintain a safer environment for both riders and campers (Bury and Fillmore, 1974).

Overall, the results of the user preference surveys discussed previously reveal a potentially conflicted OHV user base in that the quality of their associated recreational activities could be affected by OHV activities. For example, campers who wish to ride OHVs for additional recreation, but who feel strongly that OHV use should be restricted to designated areas, are likely to feel dissatisfied if other OHV users ride through the campground and/or on hiking trails.

Similarly, if OHV use in preferred hunting or fishing areas—or other areas crucial to healthy populations of game and fish species—degrades habitat quality that results in diminished game and fish populations, then OHV riders who also hunt and fish may experience dissatisfaction.

Similar to a Colorado OHV survey (Crimmins 1999), user patterns in attitudes and beliefs were revealed through a survey of 336 ATV and motorbike users conducted by the Idaho Department of Parks and Recreation (Achana, 2005). On a scale of 0-7 (from least to most serious), respondents were asked to rank 23 issues of concern to them. Results indicated that the most serious issues of concern (in descending order of seriousness; scores greater than 4) were

- permanent closure of an area the recreator uses most,
- temporary closure of an area the recreator uses most,
- inattentive/careless recreators engaged in motorized recreation,
- litter,
- too many rules and regulations, and

- poor communication of rules and regulations.

Conversely, respondents felt that issues they were not concerned with (in ascending order of seriousness; scores less than 3) were:

- too few rules and regulations,**
 - **inadequate facilities at campsites,**
 - **ATV impacts on water,**
 - **motorcycle impacts on water,**
 - **problems with parking availability for OHV-support vehicles,**
 - **lack of suitable campsites,**
 - **ATV impacts on wildlife, and**
 - **some other (unlisted) issue of concern in OHV use areas.**
- Issues of concern that fell in the middle (in descending order of seriousness) were**
 - **inattentive/careless non-motorized recreators,**
 - **OHVs traveling too fast,**
 - **motorcycle impacts on soil,**
 - **motorcycle impacts on vegetation,**
 - **ATV impacts on vegetation,**
 - **hunters on OHVs off designated roadways and trails,**
 - **ATV impacts on soil,**
 - **motorcycle impacts on wildlife, and**
 - **noise from OHVs.**

Combined, the top three possible factors contributing to creation of unauthorized trails indicate that closures of OHV areas could result in at least local increases in dispersed use. Finally, when presented with a list of four alternatives for creating uniform OHV access requirements to all recreation areas, trails, and roads on Idaho public lands, 53 percent of the respondents selected the alternative "Open to

OHVs unless posted as closed by signing,” and 33 percent selected the alternative “Open to OHVs unless posted as closed by signing, designation, or description.”

Only 6.1 and 1.0 percent felt that areas should be “Closed to OHVs unless open by signing, designation, or description” or “Closed to OHVs unless open by signing,” respectively (6.7 percent did not respond to this question).

These results are consistent with the top possible factors contributing to creation of unauthorized trails: the belief that OHV users should be free to go anywhere unless posted as closed by signing, designation, or description.

2.7.5 Economic Benefits and Costs of OHV Use

The literature search conducted for this report, as well as personal communications with experts working in the field of outdoor recreation socioeconomics, revealed no published studies on the socioeconomic costs generated by OHV use. **These costs could include the degradation or loss of ecosystem services, the costs of restoring OHV sites, and the loss of revenues from non- motorized recreators who seek alternate areas for recreation where motorized recreation does not occur.**

Examples of degraded or lost ecosystem services would be the diminished capacity for a given watershed to provide high-quality water, diminished water infiltration into aquifers, and flooding resulting from increased runoff where soils become compacted. Lost constituencies (and associated revenues) could include not only non-motorized recreators, but also hunters and anglers whose primary recreational foci (wildlife and fish) may have undergone population declines due to the effects of OHV use. At this time, however, the *true* benefit:cost ratio of OHV use remains unknown.

2.7.6 Annotated Bibliography for Socioeconomic Implications of OHV Use

Badaracco, R.J., 1976, ORVs—Often rough on visitors: Parks and Recreation, v. 11, no. 9, p. 32-35, 68-75.

This paper first reviews relevant literature on user conflict and discusses the one-sidedness of conflicts between OHV and non-OHV users, as well as the spatial nature of conflicts that occur when non-OHV users seek solitude and quiet and OHV users seek places for challenge and adventure. The paper then describes the ISD (impairment, suppression, displacement) syndrome: impairment is the diminished enjoyment among non-OHV users when they come into direct or indirect contact with OHV impacts; suppression is reduced

participation of the non-OHV group; and displacement is the abandonment of a site impacted by OHV activity.

Land planners and managers often misinterpret displacement as disinterest in the abandoned activity and, in so doing, may focus management efforts and other resources on OHV user demands.

Bury, R.L., and Fillmore, E.R., 1974, Design of motorcycle areas near campgrounds—Effects on riders and non riders: College Station, Texas, Department of Recreation and Parks, Texas A & M University, Technical Report, 72 p.

This document analyzes some of the psychological and sociological effects of constructing motorcycle riding areas adjacent to fixed-site campgrounds.

It describes rider and camper profiles, rider and camper perceptions of riders, and camper and rider preferences and satisfactions with respect to the proximity and design of riding areas.

Cordell, H.K., Betz, C.J., Green, G., and Owens, M., 2005, Off-highway vehicle recreation in the United States, regions, and states—A national report from the National Survey on Recreation and the Environment (NSRE): U.S. Forest Service, Southern Research Station, Technical Report, 90 p.

This report was prepared for the U.S. Forest Service's National OHV Policy and Implementation Teams. The data from the NSRE were collected between the fall of 1999 and late 2004. The focus of this report is off-highway driving of motor vehicles. The 15 July 2004, U.S. Forest Service draft rule regarding management of motorized vehicle use has increased attention on where and how OHV recreation occurs and is offered. As public land managers are tasked with the responsibility of examining and implementing clear and consistent agency policy, understanding who the OHV recreators are has become ever more important. The growing use of motor vehicles is prompting the Forest Service to revise its management of this use so that the agency can continue to provide opportunities desired by the public, while sustaining National Forest System lands.

Crimmins, T., 1999, Colorado off-highway vehicle user survey—Summary of results: Denver, Colorado, Colorado State Parks, Technical Report.

This report summarizes a State Parks user survey designed to elucidate OHV rider-use patterns, what riders want in a recreation area, enthusiast values and beliefs, use of OHVs in hunting, how the state OHV fund should use the funds collected, and rider perceptions of how OHV funds are used, lands are allocated, and routes are managed.

Dave Miller Associates, 1981, An economic/social assessment of snowmobiling in Maine: Windham, Maine, Dave Miller Associates, Technical Report, 52 p.

This summarizes a user survey covering economics (number of trips, distance traveled, duration, fuel, lodging, equipment) and analyzing the statewide impacts and trends indicated by the responses. (No information on demographics or user perception was gathered.)

Dean Runyan Associates, 2000, Campers in California—Travel patterns and economic impacts: Portland, Oregon, Dean Runyan Associates, Technical Report, 76 p.

This document charts the distribution of camping opportunity according to type of environment and land ownership, tallies the results of a questionnaire distributed to people using public campgrounds, and develops a comprehensive profile of camping travel patterns, demographics, and expenditures. The report provides significant detail on a wide range of camping patterns, such as how many trips, how long and where, a breakdown of the activities pursued by campers once on site, and the ethnic and income classifications of campers. Although not OHV-specific, it shows where OHV recreation fits into the big picture.

Decker, D.J., Krueger, R.A., Bauer, Jr., R.A., Knuth, B.A., and Richmond, M.E., 1996, From clients to stakeholders—A philosophical shift for fish and wildlife management: Human Dimensions of Wildlife, v. 1, no. 1, p. 70-82.

This paper begins with a call for wildlife professionals to “adopt and use the term stakeholder,” the development of which they review and the definition of which they indicate as being any citizen potentially affected by or having a vested interest in an issue, program, action, or decision leading to an action. The authors maintain that successful natural resource management in today’s society requires recognizing the array of stakeholders that demand a voice or involvement in decision-making about natural resource management.

The authors describe taking a stakeholder approach to planning and decision-making in natural resource management by including all those who might be impacted by natural resource management decisions (the authors focus on fish and wildlife management, but the principle is applied throughout natural resource management).

The process entails developing communication strategies for understanding and representing stakeholder concerns, attitudes, and conflicts. The authors maintain that today's successful professional resource managers need to "...seek a widely recognized image of giving unprejudiced consideration to all significant stakeholder interests in management decisions."

Fisher, A.L., Blahna, D.J., and Bahr, R., 2001, Off-highway vehicle uses and owner preferences in Utah: Logan, Utah, Institute for Outdoor Recreation and Tourism, Department of Forest Resources, Utah State University, Report no. IORT PR2001-02, 80 p.

This study entailed an OHV user survey to examine owner characteristics, attitudes, and preferences. Respondents were selected at random from Utah OHV registrations and interviewed by telephone. This was a very extensive questionnaire, including the verbatim responses to interviewers' open-ended questions. Other questions included demographics, vehicle type used, where ridden, distance traveled, types of riding preferred, attitudes toward OHV program fund use, attitudes toward training and safety, and much more.

Jim, C., 1989, Visitor management in recreation areas: Environmental Conservation, v. 16, no. 1, p. 19–32.

This paper discusses various visitor-management measures for diminishing or precluding the effects of visitor impacts on natural resources in recreation areas by employing existing recreation-management research on visitor decisions—such as trip duration, difficulty, and desired environment—to suggest ways of dispersing use into patterns that do not result in damage to natural resources. It also examines various management scenarios: signs and maps to direct users into a managed pattern, restricting admission, lotteries, and various rationing/pricing concepts.

Kockelman, W.J., 1983, Management Concepts, in Webb, R.H., and Wilshire, H.G., eds., Environmental effects of off-road vehicles—Impacts and management in arid regions: New York, Springer-Verlag, p. 399–446.

Noise and motorized intrusion were the major impacts of ORVs on non-OHV users. Permitting OHV activity on public land is described as "inefficient" in the goal to provide for multiple uses because the noise, dust, and speed of just one OHV can exclude all other recreators from an area. The author categorizes OHV users as work-related users, recreational users, or "bad apples." Work-related users are natural resource managers and utility workers, among others. Recreators are further categorized as casual (value aesthetics more than the challenges of riding) or endurance riders.

"Bad apples" are characterized by a complete lack of concern about their impacts and are likely to be noncompliant with regulations.

Nelson, C.M., and Lynch, J.A., 2001, A usable pilot off-road vehicle project evaluation: East Lansing, Michigan, Department of Park, Recreation and Tourism Resources, Michigan State University, Technical Report, 50 p.

This report details the results of an interagency effort to increase compliance with OHV rules in a Michigan State forest. An OHV-rider survey asked for respondents' perceptions of signs, maps, and trail systems in the pilot area, as well as rider perceptions of any law enforcement contact riders may have had during the study period. The survey also queried each respondent's understanding of pilot area regulations and offered the opportunity to give open-ended comments. There is also a detailed discussion of the participating law enforcement agencies' response to the pilot project, including officer concerns, jurisdiction conflicts, workload distribution vs. agency priorities, and an analysis of sign survival in the pilot project areas. Finally, interviews with park manager/grant recipients and discussion of the results in terms of park administration, funding, staffing, and resource protection are provided.

Nelson, C.M., Lynch, J.A., and Stynes, D.J., 2000, Michigan licensed off-road vehicle use and users 1998–99: East Lansing, Michigan, Department of Park, Recreation and Tourism Resources, Michigan State University, Technical Report, 49 p.

This details a survey of randomly selected OHV owners in 1999. In addition to questions about demographics, expenditures, type of OHVs owned, and preferred activities, respondents were queried about their perceptions of specific aspects of the State OHV program. One section is dedicated to comparing this survey with a similar survey from 1988.

Propst, D.B., Shomaker, J.H., and Mitcheekkm, J.E., 1977, Attitudes of Idaho off-road vehicle users and managers: Moscow, Idaho, College of Forestry, Wildlife and Range Sciences, University of Idaho, Technical Report, 30 p.

This report provides background information on, and an introduction to OHV use in, the era when it was new and poorly understood, and includes one of the earliest OHV/OSV (over-snow vehicle) user surveys. It compares user and land manager responses in the same survey; both groups were queried about their perceptions of environmental impacts, causes of conflicts, uses of public money for facilities, regulation enforcement, impacts on wildlife, and reasons for pursuing OHV/OSV activities.

3.0 Potential Indicators for Evaluating and Monitoring OHV Effects

3.1 Summary

There are numerous parameters that have the potential for serving as indicators of OHV effects in monitoring or research programs. Every attempt was made to provide an inclusive list of potential indicators of OHV effects described in the OHV effects literature (listed below). Of those listed, some correspond with BLM's 17 indicators of rangeland health; others are quite different but could provide supplemental data for evaluating or monitoring OHV effects (for

example, erosion and/or sedimentation rates would complement assessments of rill formation and other surface changes) or fill indicator voids (such as those pertaining to wildlife ecology).

(1) Soil health and watershed condition

- Soil strength
- Soil bulk density
- Water infiltration rate
- Permeability
- Erosion and sedimentation rate
- Sedimentation or turbidity in wetlands
- Surface changes (for example, formation of rills, gullies, and terracettes)
- Presence/condition of soil crusts (in some cases: depending on crust type)

(2) Vegetation health

- Plant community composition (including species diversity, ratio of native to non-native or invasive species, structural diversity)
- Abundance of individuals and/or stem density
- Percent vegetation cover
- Plant size
- Growth rate
- Biomass

(3) Habitat condition and health of wildlife populations (direct and indirect)

- Habitat patch size and connectivity
- Wildlife community composition (including species diversity, ratio of native to non-native or invasive species)
- Abundance, density, and distribution
- Population sizes and trends
- Survivorship, productivity, body mass, and roadkill rates
- Age-class and gender structure
- Frequency of OHVs passing through a given area
- Road or trail type and width

- Level (decibels), duration, and timing of traffic noise

(4) Water quality

- Sedimentation rate
- Levels of turbidity and suspended solids
- Contaminants levels, including levels of petroleum-derived compounds from spills (aromatic hydrocarbons in particular)

(5) Air quality

- Dust levels
- Levels of by-products of OHV emissions (including polycyclic aromatic hydrocarbons, carbon monoxide, nitrogen oxides, ozone, and sulfur dioxide)

(6) Socioeconomics (direct and indirect)

- Recreator satisfaction with their recreation (or other) experiences
- Compliance with OHV (or other) regulations
- Knowledge regarding effects of user activities on various aspects of land health
- Mapping the distribution and intensity of OHV versus non-motorized recreation and other land uses,
- Patterns of regulation compliance (as evidenced by creation of unauthorized trails, damage to vegetation, and so on)
- Trends in local economic indicators associated with OHV and non- motorized recreation and other land uses (for example, sales in camping equipment, gasoline, restaurants, lodging facilities)

Specific research questions and management goals—as well as sensitivity to OHV effects and the availability of funding and personnel—will determine the potential efficacy of using any one indicator to evaluate or monitor OHV effects on BLM lands.

Qualitative indicators may be most useful for rapid assessments, whereas quantitative indicators may be needed for long-term monitoring.

Ultimately, however, implementing an OHV effects monitoring program will require consultation with topical experts and additional research to identify or develop appropriate and efficient indicators and field methods for evaluating and monitoring OHV effects (personal communication from D.A. Pyke to Z.H. Bowen, U.S. Geological Survey, Fort Collins, Colorado, August 2007). Work on developing such indicators is currently underway by rangeland ecologist, D.A. Pyke, U.S. Geological Survey in Corvallis, Oregon.

Management and Enforcement issues of going off the trail

In multiple surveys, the Off Road Vehicle community acknowledges that they intentionally go off the trail.

91 % of the rangers in one study in the Final EIS 2/2010 for Shasta Trinity National Forest stated that OHV drivers going off the trail is a serious problem.

(Doc 15 B) pg. 261

Following are some photos that are examples of this aspect of the recreational sport that has significant environmental impacts.

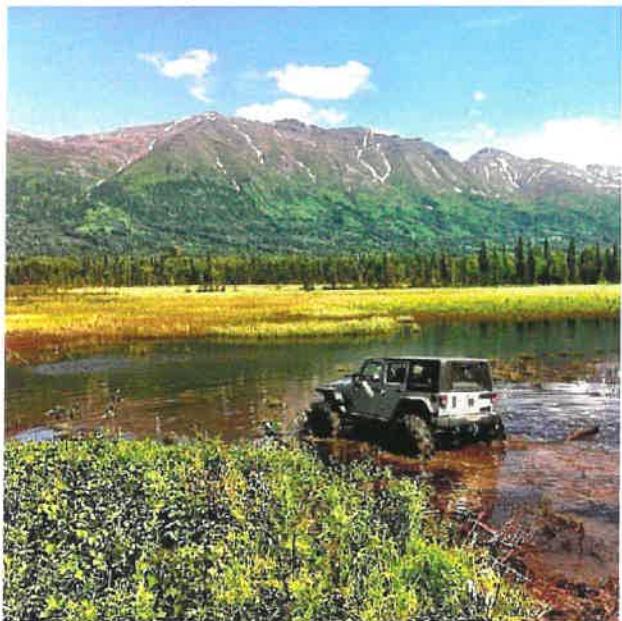




jeep (noun): \jēp

The most kickass ride worldwide,
new or old. It is not a car,
not a truck, it's a JEEP!

It will go anywhere, anytime,
in any weather. It squeaks, leaks,
rattles, and looks best all covered
in mud. An off-roading beast,
recovery vehicle and
badass big kids toy!



E.O. 11,644

Executive Order (E.O.) 11,644 directs federal land management agencies to adopt a procedure for designating trails and areas as open or closed to ORV use. The Order requires the designation to “be based upon the protection of the resources of the public lands, promotion of the safety of all users of those lands, and minimization of conflicts among the various uses of those lands.”

The proposed Route traverses the Superior National Forest in St. Louis and Lake Counties. In Lake County the Route enters remote regions of the Superior National Forest following low standard construction roads within 1-2 miles of the BWCAW boundary and BWCAW Entry Points. There are numerous crossing of high quality streams flowing into the BWCAW on these low standard construction roads that would potentially receive a substantial increase of sedimentation from increased levels of the proposed Border to Border route high impact traffic and possibly degrading waters within the BWCAW.

In addition, an Environmental Assessment is needed to determine whether impacts from the Border to Border Route on wildlife and threatened species such as the Canada lynx , the gray wolf, wood turtle, northern long eared bat and rusty patch bumblebee and the protected American bald eagle are in compliance with Minimization Criteria.

Increased levels of high impact vehicle traffic, especially large group OHV Club traffic on these roads serving BWCAW Entry Points could result in User Conflicts. Higher levels of noise from large group OHV Club traffic may carry into the BWCAW degrading the wilderness experience for BWCAW visitors. Border to Border Route users may leave the Route to drive roads leading to BWCAW Entry Points potentially leading to congestion, bringing increased noise closer into the BWCAW and additional User Conflicts. It is the position of this Petition that these potential impacts fall under Executive Order 11,644.

<https://repository.law.umich.edu/cgi/viewcontent.cgi?article=1047&context=mjeal>

E.O. 11,644 further provides specific criteria for making those designations, which are often referred to as the “minimization criteria”:

- (1) Areas and trails shall be located to minimize damage to soil, watershed, vegetation, or other resources of the public lands.
- (2) Areas and trails shall be located to minimize harassment of wildlife or significant disruption of wildlife habitats.

(3) Areas and trails shall be located to minimize conflicts between off-road vehicle use and other existing or proposed recreational uses of the same or neighboring public lands, and to ensure the compatibility of such uses with existing conditions in populated areas, taking into account noise and other factors.

(4) Areas and trails shall not be located in officially designated Wilderness Areas or Primitive Areas. Areas and trails shall be located in areas of the National Park system, Natural Areas, or National Wildlife Refuges and Game Ranges only if the respective agency head determines that off-road vehicle use in such locations will not adversely affect their natural, aesthetic, or scenic values.

This Order was later amended by E.O. 11,989, which required immediate closure of areas or trails to ORV activity in the event of considerable adverse effects to resources.

<https://repository.law.umich.edu/cgi/viewcontent.cgi?article=1047&context=mjeal>

Another Forest Service document mentions the Forest Service responsibility to protect adjacent Wilderness Areas such as the BWCAW from ORV impacts:

Travel Management; Designated Routes and Areas for Motor Vehicle Use: Final Rule

36 CFR Parts 212, 251, 261, and 295 *Comment.* Some respondents requested specific direction on protection of wilderness study areas and inventoried roadless areas to preserve their roadless, nonmotorized character. Respondents also suggested prohibiting motor vehicle use within a buffer zone surrounding wilderness areas. *Response.* Management of wilderness study areas established by Congress is generally governed by their authorizing legislation.

Management of inventoried roadless areas is governed by the applicable land management plan and Forest Service policy. The Department does not believe that additional direction for management of these areas is necessary or required in this final rule. Nor does the Department believe that it would be appropriate to prohibit motor vehicle use within a buffer zone surrounding wilderness areas. **Responsible officials will consider impacts to nearby wilderness areas, wilderness study areas, and inventoried roadless areas during the designation process.**

[https://www.fs.fed.us/recreation/programs/ohv/final.pdf \(Pages 68282-3 of document\)](https://www.fs.fed.us/recreation/programs/ohv/final.pdf)

CONCLUSION:

Regarding the condition of USFS roads on the proposed Route and compliance with Minimization Criteria For Off-Road Vehicle Use under Presidential Executive Orders 11,644 and 11, 989:

The DNR Proposer for The Border to Border Route has indicated that because the Route follows existing roads it is subject to a lower environmental review standard and that Environmental Review is not needed.

It is the position of this Petition that the “existing roads” status does not apply to the deteriorating unmaintained low standard construction on USFS roads. Forest Service documents indicate that Forest Service roads fall under a definition and level of construction that is separate and different from definitions and construction standards that apply to roads under other government jurisdictions on the proposed Route. Therefore the “Existing Roads” label and standard of construction used by the DNR proposer does not properly apply to the low standard construction. As indicated in Forest Service comments below, “Not all roads on NFS lands are constructed. Not all roads on NFS lands need regular mechanical maintenance, and not all roads on NFS lands are suitable for use by a passenger car.”

With this definition and standard of construction, it cannot be automatically assumed, as the DNR Proposer is suggesting, that USFS roads are sufficiently constructed to protect the environment from a significant increase of traffic. An Environmental Assessment is needed to determine if Border to Border traffic on Forest Service roads is in compliance with Minimization Criteria.

Forest Service: Travel Management; Designated Routes and Areas for Motor Vehicle Use: Final Rule

Comment. Some respondents stated that the final rule should include in the definition for a road the phrase, “constructed, receiving regular mechanical maintenance, and suitable for use by a standard passenger car.” Other respondents expressed support for the flexibility to identify and manage a road as a trail. “

Response. The definition for a road in part 212 applies to subpart A, Administration of the Forest Transportation System, subpart B, Designation of Roads, Trails, and Areas for Motor Vehicle Use, and subpart C, Use by Over-Snow Vehicles. Given the broad application of the definition, the Department believes it would be unduly restrictive and inaccurate to add the phrase, “constructed, receiving regular mechanical maintenance, and suitable for use by a standard passenger car,” to the definition for a road. **Not all roads on NFS lands are constructed. Not all roads on NFS lands need regular mechanical maintenance, and not all roads on NFS lands are suitable for use by a passenger car.** <https://www.fs.fed.us/recreation/programs/ohv/final.pdf> (page 68275 of document)

REFERENCE KEY:

DOCUMENTS..... Doc #

INVASIVE SPECIES(#)

WILDLIFE..... Ref #

DOCUMENTS

(Doc1)- (Doc 102)

Rep. John Persell
State Representative
District 5A



Minnesota House of Representatives

June 12, 2020

Commissioner Laura Bishop
Minnesota Pollution Control Agency

Commissioner Sarah Strommen
Minnesota Department of Natural Resources

Dear Commissioners:

As the planning for the State's first of 20 touring routes for Highway Licensed Off Road Vehicles (OHVs) nears its final stages, there are important questions being raised regarding its implementation that we believe need careful review before the project moves forward.

Citizens have raised legitimate concerns that a Discretionary Environmental Assessment Worksheet is warranted to gather and review more information about the route and its potential environmental impacts to some of our state's most pristine waters, to assess the project's potential interference with other recreational and commercial uses and for the potential spread of invasive species along the designated route, which would cross the state. I urge you to give their request strong consideration.

I am concerned that as presently designed, the project does not propose to adequately monitor, manage or maintain the roads themselves or protect the natural resources and sensitive water bodies along this route. Furthermore, this first Border to Border (B2B) route will serve as a prototype for the additional 19 such routes that are in various stages of planning according to the legislative testimony of the Minnesota Four Wheel Drive Association President who called OHV touring "the next big thing".

While the 764 mile B2B route is proposed along existing roads for use by highway licensed OHVs, these roads are almost exclusively unpaved and encompass a wide variety of road types, including unmaintained primitive single-lane dirt and minimum maintenance roads in remote areas of Northern Minnesota's pristine waters region. These roads historically receive minimal traffic and were not engineered or routed for more intensive two-way touring use with Off-Road Vehicles.

This first proposed route, which is already being nationally advertised on Off Roading websites will result in a significant increase in high impact traffic load to these unpaved historically low traffic volume roads. In a March 2017 letter to the DNR the US Fish and Wildlife Service expressed serious concerns for potential adverse impacts from this project citing the increased traffic that could result from designating such a route and that such designation would induce uses by large packs and caravans.

The most recent route alignment crosses 27 trout streams 61 times in one County. It also crosses multiple Exceptional MPCA ranked waterways of "Outstanding Value Resource waters" and other Outstanding Value Resource Waters ranked "Prohibited" for any water quality degradation. As the DNR moves forward with this project we are requesting more information for how the resources along this route will be monitored and protected, including any plans for addressing problematic culverts, bridges or stream crossings, which are specifically mentioned in the MPCA watershed management reports for these waterbodies. And we are particularly interested in what consideration has been given for

alternative project routes and designs that may have far less potential for adverse impacts on Minnesota's water and other natural resources.

For this and future routes to be sustainable, it would seem imperative to first consider alternative facilities and locations that meet the recreational needs of this group but have less potential for harm. Even then, the project should have a monitoring plan established that includes measurable thresholds of impact that trigger preventive rather than remedial actions along the entire 764-mile route.

It is dangerous to implement a motorized recreation project like this through some of our most valued and sensitive waters without a specified plan in place to monitor and prevent damage to these treasures.

Specifically, how does the plan address the following:

- What specific measures will be implemented to monitor traffic and impacts to vulnerable waterways or other resources along the route and who will manage the data collected?
- What is the plan IF a waterway or wetland along route is inadvertently degraded and can no longer support its designated ranking? Is there a plan and source of funding identified to restore that waterbody to its previous designation?
- Are there any established setbacks from surface waters or rules-of-the-road requirements to be monitored for information useful in planning future routes?
- Will there be ongoing professional staff available to monitor and manage invasive species along the route? And will there be decontamination wash stations along the route to prevent invasive species spread?
- How many FTE would be needed to monitor and enforce the rules of use the route?

As the state looks at whether or not to establish this first or even more OHV touring routes it is critical that we establish impact metrics with predetermined acceptable or unacceptable impact limits and gather data on impacts of this initial route in to order to both prevent environmental damages and to establish sound research that can be applied to the planning for future OHV touring routes.

We need to make sure that we are protecting our natural resources while allowing more Minnesotan and out of state recreational drivers the ability to explore our state compatibly and responsibly. I look forward to your responses

Sincerely,



John Persell

State Representative

Border-spanning adventure trail in the works for northern Minn. Doc 1A -211-

Dan Gunderson · Aug 2, 2017

Sports & Leisure



Ron Potter with the National Off Highway Vehicle Conservation Council drives down a forest trail northwest of Bemidji. *Dan Gunderson | MPR News*

LISTEN Story audio

4min 29sec ([https://www.mprnews.org/listen?
name=/minnesota/news/features/2017/08/02/20170802_gunderson_20170802_64.mp3](https://www.mprnews.org/listen?name=/minnesota/news/features/2017/08/02/20170802_gunderson_20170802_64.mp3))

If you like bumpy, dusty, winding roads, you'll love the new border-to-border trail in the works across northern Minnesota.

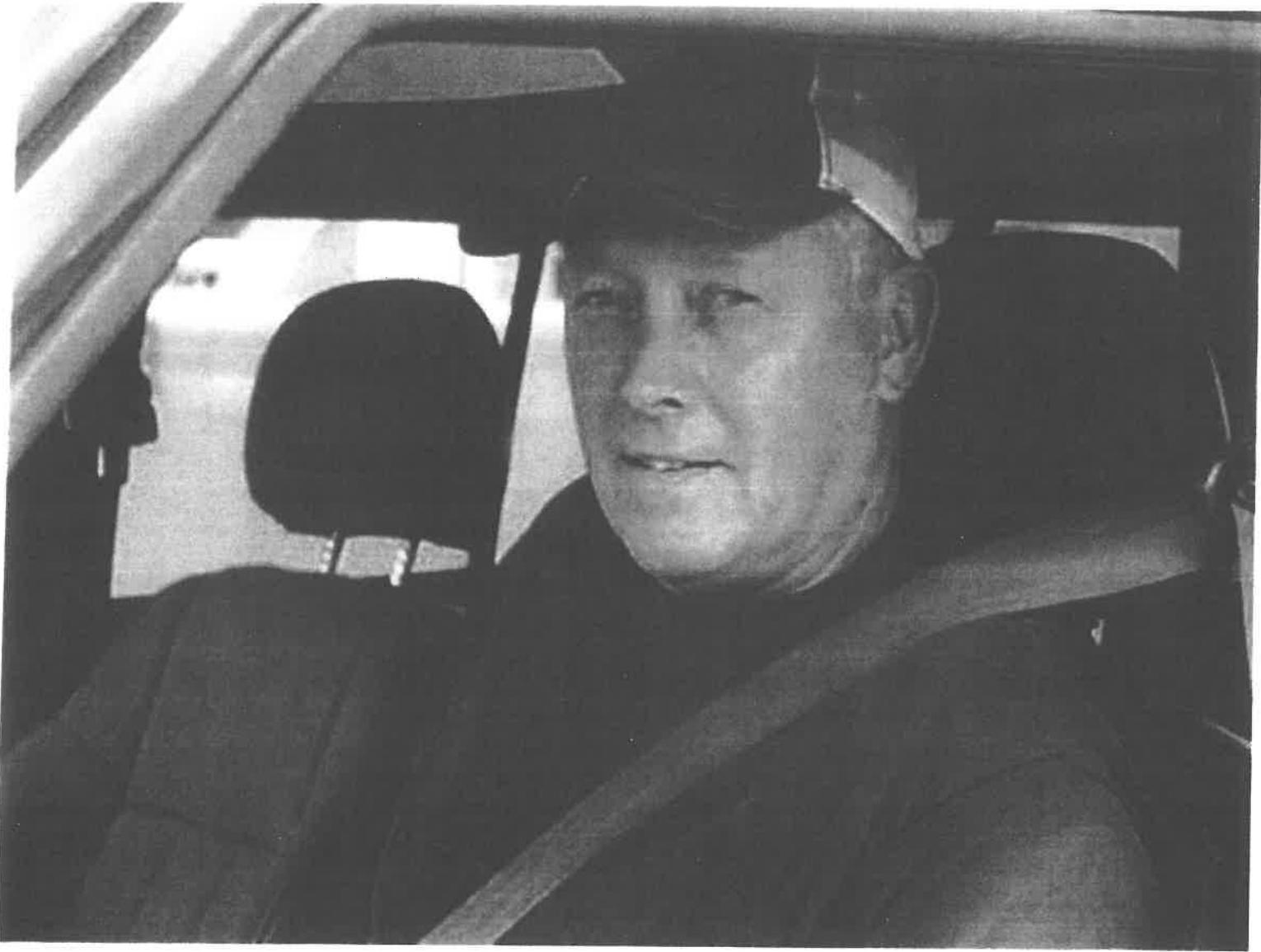
The adventure touring trail could be open late next summer, linking little used back roads and forest trails to take motorists on an off-the-beaten-path trek across the state.

However, some local officials are less than enthusiastic, worried about increased road repair costs and law enforcement needs created by more traffic.

The trail will start at Grand Portage at the tip of the Arrowhead region and end at the North Dakota border somewhere in far northwest Minnesota. Along the way, it will pass through deep forests, past lakes and rivers and across prairie and farmland. A canopy of trees overhead shade the road as Ron Potter turns onto a narrow cut through the forest northwest of Bemidji. This road was built for logging, perhaps decades ago and it's bumpy with occasional muddy spots. *-212-*

"Definitely looks like it's minimum maintenance. They maintain it when they need to for timber harvest reasons," said Potter, as his four-wheel-drive Jeep jounced over ruts and squished through muddy spots. *Doc 1A*

Potter is a retired Department of Natural Resources trails employee who's now a consultant for the National Off Highway Vehicle Conservation Council (<http://www.nohvcc.org/>). The DNR contracted with the off-highway vehicle council and the Minnesota Four Wheel Drive Association (<https://www.mn4wda.com/>) to manage the project.



Ron Potter Dan Gunderson | MPR News

In 2015, the Legislature authorized using registration fees and gas tax from off road vehicles for trail development.

Potter was "ground truthing" one recent day, which entails driving roads that look like a potential trail segment on a map.

He turns onto a trail that's just two wheel tracks with tall grass between, a road that hasn't seen tires in some time. But that's just what Potter is looking for.

This would be ideal. It would be nice if we could have the entire adventure trail something like this," said Potter.

But a couple of miles down the trail there's a T in the road. Potter studies a map to decide which way to turn. In the end, he decides to turn around and head back the way he came. *-2-*

"It's not going to get us where we want to. The one dead ends over here on a lake and the other one looks like it headed into a large wetland," Potter said. "Planning from the office with a map is one thing. But getting out on the ground and seeing what's going to work is totally different."

DOC 1A-213-

Potter is one of three people driving back roads this summer to map a draft route for the trail. On a good day, he said, he can map 30 to 40 miles of trail. He expects the winding route to total between 400 and 500 miles when completed.

As they work to link this maze of backroads across the state, the trail designers are looking to also connect interesting sites and campgrounds that aren't as busy as state parks.

"We're focusing more on county parks, city parks," Potter said. "There's some forest campgrounds that are underutilized."

The traffic the trail will bring to remote areas will provide a boost to the northern Minnesota tourism economy, Potter said. But some county and township officials worry it will cost them money.

Long Lost Lake township in Clearwater County is one of a few townships in the area on record opposing the trail.



Long Lost Lake Township board chairman Greg Scherzer | MPR News

Town board chairman Greg Scherzer questions the economic impact theory. He said there just aren't many places to spend money in remote areas.

"That economic stuff, it's meaningless to us. As far as I'm concerned, it's an empty promise," he said.

-3-

Township officials are more concerned about what increased traffic on a designated trail will do to already stretched road maintenance budgets.

DOC 1A-214-

"We already have a hard enough time with four-wheelers. Four wheelers tear our roads up," said Scherzer. "There's no doubt there would be extra maintenance and we don't have extra money to clean up extra stuff."

Other local officials raised concerns about the cost of monitoring traffic and enforcing laws on the trail, but said they're withholding judgment until they know more about the project. Several said they felt out of the loop on the project.

More information will be provided to local officials soon, according to DNR Off Highway Vehicle program consultant Mary Straka.

She said the trail route needs to be better defined before local officials weigh in. "We'll be moving into a phase where we will be in closer communication with the counties and we'll be working with the county staff to better inform their boards," Straka said.



This two-wheel track through the forest would be idea for an adventure trail being mapped across northern Minnesota, according to Potter. Dan Gunderson | MPR News

The goal is to align the trail in areas where local officials are supportive, said Straka.

Potter said off-road vehicle clubs across the state will be enlisted to help care for the trail, and he hopes some grant-in-aid funds will be available to help local governments as well.

-4-

The DNR envisions the trail as a slow speed route for highway licensed cars and trucks, not a test course for high powered trucks with big tires ripping up the ground.

Dec 14-215

"This is more for, you know, a family that wants to spend the weekend or a week out touring the backroads of northern Minnesota, doing some camping, seeing the sights," said Potter.

A phase two plan to build several challenge loops off the trail to attract serious off road aficionados won't happen for several years, Potter said.

The draft trail route will be finalized later this fall. Then local officials will have a chance to offer input before the route is finalized early next summer.

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North Star Chapter
2300 Myrtle Avenue, Suite 260
St. Paul, MN 55114

Commissioner Sarah Strommen
Minnesota Department of Natural Resources
500 Lafayette Road
Saint Paul, MN 55155

Re: proposed Border to Border Touring Route (B2B) environmental review process (EAW)

August 5, 2020

Dear Commissioner Strommen:

It has come to our attention that DNR is considering an environmental review process (EAW) for the Border to Border Touring Route. We strongly support this.

Because the Off-Highway Vehicle (OHV) use in Minnesota is increasing exponentially the increase in damage to natural resources, sensitive habitats, and our precious wetlands, streams, lake shores and rivers has far reaching impacts to our land based and aquatic wildlife. This use has also caused increased conflicts with quiet use recreation. The Sierra Club has concerns with the cumulative resource damage that may be the result.

With 581 new bodies of water added to impaired waters in 2019, Minnesota now sits with 56% of its waters on the impaired waters list according to the Minnesota Pollution Control Agency (MPCA). In contrast, during the same time period only 14 lakes and 2 streams were removed from the list. This should be alarming to Minnesota residents. It's clear from the data we must start taking water protection more seriously.

Sierra Club has been following the route proposal and its potential environmental and wildlife impacts closely. As stated in legislative testimony by the Minnesota Four Wheel Drive Association, the proposed Border to Border route is the first of 20 routes the MN4WDA has in the pipeline. Therefore, we feel it is imperative that this initial route, which would be a prototype for more to follow, is carefully planned and analyzed to minimize environmental impacts BEFORE the route is final.

We agree with the concerns that Representative John Persell, Chair of the House Environment and Natural Resources Policy Committee, included in his letter in June 2020 regarding the proposed existing B2B Route.

In particular, the Minnesota DNR Parks and Trails proposal fails to provide important facts about the scope of the project, environmental risks, and guaranteed long term maintenance funding that are critical to effective implementation and management of a route of this length and breadth (764 miles are indicated for this first in a series of trails).

We believe it's important to consider the impact this project will have on some of the State's most pristine waters and most sensitive aquatic and terrestrial habitats. As an example, considering the invasive species issue alone, with no provision for wash stations, no added staff for monitoring or management of the designated 764 mile route, the potential for habitat degradation and ultimately ecosystem destruction in the years ahead, is very real.

Both the USFS and the DNR invasive species accounts do not have the funds to manage current invasive infestations, let alone an increased spread across the entire state from high impact vehicles that may go off road.

Just two of the broad points the Parks and Trails proposal misrepresents about the route are:

- 1) The proposal underplays trout stream impacts stating that the proposed route would cross **several** trout streams. As the alignment stands, in Lake County alone, the proposed route would cross **27 designated trout streams 61 times**. There is no mention of the 9 Exceptional MPCA ranked streams crossed 24 times, or the 3 Prohibited Waters crossed 8 times, all on unpaved roads and many with minimal buffer zones.
- 2) We also disagree with the statement there is no change in use of the roads. Using OML2 roads for a designated, nationally advertised route for high impact vehicles on roads that were never intended for that purpose is a change in use. These roads lack the width, shoulders and drainage required for a designated, two-way route and are classified by the Forest Travel System for minor traffic and dispersed recreation.

The environmental review should analyze these issues as well as other concerns that the USFS has outlined. One of the concerns relates to the volume of traffic stating that an increase of 5 cars a day could be a large impact on some of the low use roads on the proposed route. There are other concerns listed by USFS staff that we also share regarding who would enforce seasonal closures, who would deal with storm related events and concerns about the cumulative effects and financial commitments needed for the long-term.

Although this proposed route is on existing roads, they are almost exclusively unpaved and include a variety of road types, including unmaintained ones. Many of the roads have historically low traffic volume and were built long before the science of road ecology or environmental impact review. These roads, *even some OML3 and 4 roads*, lack shoulders, good drainage and have insufficient buffers from water features. It is the increased intensity of high impact recreational traffic that we contend may be a potentially significant "change in use" and that can and should trigger the higher level of scrutiny an environmental review can provide.

These are but a few of the very important issues that should be analyzed fully before this Route moves forward.

Thank you for your time and consideration.

Sincerely,

Doc 1B -215C-

Margaret Levin

Margaret Levin
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MINNESOTA DIVISION IZAAK WALTON LEAGUE OF AMERICA

Our Mission: To conserve, restore, and promote the sustainable use and enjoyment of our natural resources, including soil, air, woods, waters, and wildlife.

MINNESOTA DIVISION IZAAK WALTON LEAGUE OF AMERICA

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August 10, 2020

Minnesota DNR Commissioner

Sarah Strommen

Dear Commissioner Strommen,

The Izaak Walton League is a 97 year-old grassroots conservation organization with 16 chapters across Minnesota. Our mission is to conserve, restore and promote the sustainable use and enjoyment of our natural resources. Izaak Walton League members recently approved a resolution opposing funding for the proposed Border-to-Border trail system as presently designed. Our concerns involve the potential for significant environmental effects from increased heavy traffic from vehicles designed for off-road use on lightly-used roads traversing sensitive environments. The proposed route includes many wetlands, large tracts of forests and numerous stream crossings, and presents the potential for increased illegal riding off-road in these environments. The Izaak Walton League recognizes the legitimate desires of the ORV community to enjoy their motorized form of recreation. We support as an alternative closed-loop, contained facilities that can and have been developed in our state and others to sustainably accommodate this **high-impact motorized sport**.

See Resolution Below. **Please see note in red below.** Thank you.

Sincerely,

John Rust

Minnesota Division of the Izaak Walton League - President

763-202-3346

Cc: Craig Sterle, Willis Mattison, Lois Norrgard, Jen Wahls, Jill Crafton, John Crampton, Matt Norton

RESOLUTION OPPOSING Border to Border ROUTE FUNDING

Adopted at the Annual Meeting April 27, 2019

THERFORE BE IT RESOLVED: that the Minnesota Division of the Izaak Walton League of America in Convention on April 27th, 2019 finds the proposed B2B Route very unsustainable and highly

inconsistent with its mission to conserve, restore, and promote the sustainable use and enjoyment of our natural resources, including soil, air, woods, waters, and wildlife and;

BE IT FURTHER RESOLVED: That the League oppose the funding for the B2B project as presently designed, whether from general funds or dedicated gas tax funds as proposed in Minnesota H.F. No. 1454 and S.F No. 1599, and;

BE IT FURTHER RESOLVED: That the League affirmatively communicate its opposition to the proposed B2B project to the Minnesota House and Senate members, Governor Walz and the Department of Natural Resources, and;

BE IT FURTHER RESOLVED: That should the B2B be authorized and funded by the Legislature the League hereby requests the **Department of Natural Resources be required to prepare a full Environmental Assessment and/or Environmental Impact Statement to examine impacts, damage mitigation measures and all reasonable and prudent alternatives to the project before proceeding to implement it.**

October 5, 2020

DOC 1B-25F-

Sarah Strommen, Commissioner
Minnesota Department of Natural Resources
500 Lafayette Rd.
St. Paul, MN 55155

Re: Environmental Review for Border to Border Touring Route

Dear Commissioner Strommen:

Northeastern Minnesotans For Wilderness (NMW) is a grass roots organization that has been working to protect the Boundary Waters Canoe Country Wilderness (BWCACW) and surrounding wild places for more than 20 years.

NMW urges the Minnesota Department of Natural Resources (DNR) to undertake a Discretionary Environmental Assessment of the Border to Border Touring Route (B2B). We have watched the development of this project with great interest, since much of its current alignment passes through public lands (mostly national forest lands) that retain a high degree of ecological integrity yet are particularly vulnerable to environmental degradation. Also, the fact that B2B has been referred to as a spearhead endeavor from which to launch similar projects points to the need for special attention.

We understand that the project is at the Environmental Review Needs Determination stage. Because there are a number of issues that haven't been satisfactorily addressed, an environmental review, an EA at a minimum, is called for. We are copying this letter to Superior National Forest Supervisor Connie Cummins because the United States Forest Service (USFS) would play a role during an environmental review process.

We assume that B2B boosters are probably correct in their assumptions that national advertising and promotion of the route will increase use dramatically. So while this route currently sees a modest amount of use that does result in the sorts of impacts we list below, we expect that route designation and promotion will result in a far greater number of users and increasingly serious impacts.

Use will not only increase, it will change. Based on what's happened in similar situations elsewhere, there will likely be a bigger component of bigger vehicles on the more primitive road sections where motorized use now typically consists of ATVs. Powerful newer model machines can tear up the landscape, creating scars in seconds that can last for many years. There will be more of the convoy-style big group rides. There will very likely be more multiple day excursions, meaning more camping along the way. These are significant changes that require a thorough environmental review.

These comments specifically concern the part of B2B in Lake County and generally within SNF, but several comments apply generally to St Louis County as well.

DOC 1B
-215G-

NMW expects USFS to protect the wilderness character of the BWC AW, as it is legally required to do. B2B is at some points as close as 1 1/4 mile to the wilderness boundary and for 5 1/2 miles runs within 2 miles of the Boundary Waters. B2B will provide users easy access to inviting side trips along the Island River and to BWC AW entry points at Isabella Lake, Pow Wow Trail, Island River, Bog Lake, Little Isabella River, and Snake River. Factors that FS must consider in its review of this project include the following essential elements of the wilderness character of the BWC AW, as defined by The Wilderness Act of 1964 and by agency policy. Just as negative impacts to these elements degrade wilderness character, they will also degrade the state's natural heritage that the DNR is charged to protect.

- Water quality. All of the road segments that B2B follows in the SNF Lake County section are unpaved. There are dozens of stream and river crossings, both wet crossings and bridges, and few offer adequate design or vegetative buffering to keep eroding sediments and polluting vehicle fluids from the water. For now, the wetlands of this region hold the only pristine waters left in the state, and we strive to keep it this way. The group Citizens for Sustainable Off Roading has detailed the potential for harm and cites data that reveals how special these waters are. (See their letter of 5/27/20 to Bill Johnson, DNR Environmental Reviews on this and also more in-depth discussion of topics including designated trout streams and road classifications re water crossings.) Five of MPCA's 10 highest quality streams within the Rainy River Watershed will be crossed by B2B. They include Jack Pine Creek, Arrowhead Creek, Mitawan Creek, Little Isabella River and Stony River. Others unnamed on that list, such as Snake River, Sphagnum Creek and Inga Creek, also retain pristine qualities. All of these flow into the BWC AW or into flowing water that will reach the wilderness and so cannot be allowed to degrade. We are convinced that B2B as currently aligned will inevitably cause degradation of water quality and aquatic life.
- Air quality. Because this is an area designated Class I under the Clean Air Act, emissions from the engines of touring vehicles close to the wilderness boundary is problematic. Dust can decrease visibility enough to be a problem as well. Even one vehicle can raise a billowing cloud of dust, to be deposited wherever the wind and waters takes it. A convoy of Utility Task Vehicles or other registered OHVs or ATVs would raise exponentially more. This type of air pollution and traffic hazard is absolutely inappropriate on these normally quiet back roads and

DOC 1B
-215H-

wilderness access routes. Because this can be a serious safety concern for drivers, and health concern for trees and other plants along roads, those responsible for road maintenance may use calcium chloride treatments to keep the dust down. This is known to be hazardous to frogs, salamanders and aquatic species when salt flushes into roadside and down stream waters.

- **Wildlife.** B2B would certainly degrade habitat for moose as well as designated critical habitat for Canada lynx and the grey wolf. Moose, for example, need to be able to forage, birth and rear young, and so on, in the highest-quality habitat afforded by the state. The mix of federal and other public lands in northeast Minnesota is essential to their survival here. The wildlife literature shows that vehicles – including more silent vehicles (bicycles, E-bikes and E-motocross bikes) – moving rapidly through high-quality habitat disturbs and disperses big game out of their preferred habitat. Lower-quality habitat means lower nutrition, reduced vigor going into winter, reduced total fertility rate, and, for a declining species like the moose, a very real risk of accelerated population decline and earlier extirpation. Also, many studies have shown that loud human caused noise can disrupt the behavior of smaller species of wildlife as well as big game. Some animals may be essentially kept from desirable locations by traffic. Breeding birds may be less successful in noisy, dusty road corridors or may not be able to use these areas for nesting at all. Increased traffic across wildlife habitat always means more animals will be killed by vehicles and the risk of accidental or illegal shooting of moose, wolves, lynx and others will be more likely.
- **Non-native invasive species (nnis).** The ecological health of the Boundary Waters ecosystem is severely threatened by the ongoing onslaught of nnis. Populations of nnis plants, insects, worms and crustaceans have been documented on the lands and waters B2B will cross. The treads on the tires of the vehicles that are expected on B2B may as well have been designed to transport plants from one place to another – and that's exactly what many studies have proven that they do. A vehicle driving through a muddy area will very easily pick up seeds and/or pieces of roots. These will fall off and start new infestations all along the route. Purple loosestrife seeds could wash off in a wet crossing which drains into the BWCAW, spreading this nnis along the way. Spiny water fleas on tackle used last on an infected lake could be introduced to seldom-fished lakes along the route, some of which may drain into the wilderness.
- **The opportunity to experience solitude.** The absence of human-caused sound is an absolute prerequisite for experiencing the splendid solitude that so many people seek. This deep quiet is exceeding rare – and exceedingly easy to destroy.

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The sound of the sort of recreational vehicles that will be invited to B2B tips that precious silence to shreds. Noise from a caravan UTVs or others can easily ruin the peace and quiet enjoyed by people on both sides of the wilderness boundary.

- Motorized trespass. B2B poses some risk of illegal motorized incursion into the BWCAW. Although all the easily accessible routes into the wilderness are signed, and in some cases physical barriers such as rocks and trees are in place to block vehicles, the Tomahawk Trail area is laced with old logging roads that cross into the Boundary Waters. Even a roadway allowed to grow over for many years can be opened up fairly quickly by a few people with chainsaws. Also, The Prospector ATV Trail appears to bisect the road accessing Little Isabella and Snake Creek entry points just a couple of miles from B2B. (This segment is shown as "proposed" on one Prospector Trail map, apparently aligned with a snowmobile trail at that location; it is currently used by ATVs.) This proximity could mean higher use on the Prospector with heightened risk of trespass as well as greater potential for all the other motorized recreational vehicle impacts close to the wilderness boundary.

Many members of NMW enjoy the SNF outside of the BWCAW. We drive forest roads to get home and go to work, to get to boat access points and trailheads, to watch for wildlife, to enjoy fall colors, to get to favorite places for birdwatching, hunting and fishing, and to cut firewood. Many of us have been in the area long enough to have watched traffic volume increase year by year over the decades. We question the wisdom of promoting heavy and concentrated use on specific routes, as in the case of B2B.

Many of us enjoy using dispersed sites in or near the B2B corridor. Across recent decades these places are for the most part quiet and little-used. When one encounters others there is usually a shared appreciation for its remote qualities that tend to cultivate consideration for others. There is a fear that that consideration may be lacking in people who tour through the area in loud vehicles. This summer of Covid has shown us that even tiny out-of-the-way places can become packed with people. We don't like the prospect of that becoming a regular thing, especially with the addition of the noisy machine component.

We believe that for the sustainable enjoyment by residents as well as the full range of multiple use visitors, promoting a high traffic volume, high speed, high noise volume motorized route with this alignment is a bad idea. An example of a good idea would be to address the extreme shortage of gated hunter-walking trails. This is a sustainable use that is consistent with the ways these lands are, for the most part, currently used.

NMW would like to see every land managing agency keep climate change in mind as it considers each project. As its impacts are now consistently felt, it seems a crazy time to promote a type of recreation that spews greenhouse gases.

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Route supporters predict an economic boost to local economies from B2B. NMW has compiled a set of research findings and other data (available at savetheboundarywaters.org) in connection with its work to protect the Rainy River Watershed. These show how dependent our economies are on a healthy natural environment, and what a huge and crucial role businesses that cater to the quiet sports play. NMW believes that promoting the increase of motorized recreation in the wildest parts of Superior National Forest would be an economic as well as an environmental mistake.

A thorough review process would address concerns raised above and provide other crucial information. For example, it's difficult to consider the extent of the impacts we may see when we don't know what the draw of new users from internet advertising can reasonably be expected to be. DNR statements have ranged from few to thousands. Trends and guesses based on other trails indicate the high end is probably closest to reality, but we would like to see the DNR's fact-supported estimates.

To understand cumulative impacts, agencies and stakeholders need to have clear projections of expansion projects, challenge loops and spurs alluded to by DNR staff, as well as connections to existing and planned routes. Route users will also discover and use their own challenge features and routes made possible by the many old logging roads and staging areas, old gravel pits and quarries in the area. Several regional ATV clubs are developing trail systems across the northland, and it's unclear how they are or may become related to B2B. DNR should analyze all routes planned and likely.

In a 7/5/20 article in the Duluth News Tribune, Ron Potter speaks of a "world class trail system" (for motorized vehicles) of 1500 miles, encompassing Duluth, Grand Rapids, International Falls, the Range, and Grand Marais. How does B2B fit with this vision? (Potter retired from the DNR as a state trails program planner and now works for Polaris Industries and serves as president of the All Terrain Vehicle Association, an umbrella organization for all Minnesota's off-roading clubs, and as president of the Prospector Trail Club.)

Land managing agencies should bear in mind that to analyze any single motorized trail or route proposal without putting it in the context of a much bigger picture would be shortsighted. There are very different outlooks when it comes to promoting large scaled motorized recreation. NMW speaks for many who would prefer that the northlands' public lands retain their truly unique degree of environmental health and wild qualities. All across the country public lands are heavily used by ATVs, UTVs, OHVs and so on. Our area is a rare place where this sort of use is still modest, and the fact that tens of thousands of recreationists come here every year indicates they like it as it is.

the battle against the web of ATV trails, and the same is true among farm lands in the south. The major part of the state is overrun with motorized trail systems. The high-quality mix of recreation currently afforded on state and federal lands in northeast Minnesota needs to be preserved.

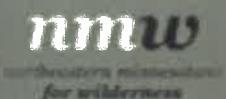
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At one time B2B was slated to cross Cook County. Citizens, the grassroots group Citizens for Sustainable Off Roading, and county commissioners were concerned about all the problems outlined in this letter, and also with law enforcement, maintenance costs and the road damage recovery cost process. Because opposition caused the route to be redrawn to end in Lake County, questions about these points were never satisfactorily answered. Unanswered questions include:

1. Is there baseline data that includes current condition and volume of traffic on all the segments of roads used?
2. Can DNR identify segments of the route that rely upon conversion of winter/frozen-only trails to summer or year-round motorized trail status and describe the implications of such a significant change? Upgrading or hardening off a segment of a winter-only trail would likely open up additional mileage to year-round use with implications beyond the immediate B2B.
3. How many high-quality waterbodies outside of the BWC AW, but flowing into it, would be crossed by this route?
4. How many designated trout streams and designated trout stream tributaries would be crossed by it?
5. What is the track record of damage at other such crossings?
6. What is the track record of county, USFS and DNR for funding and accomplishing repair and rehabilitation at wetland and stream crossings such as those which could occur along B2B?
7. Is there explicit commitment from DNR and USFS to follow legal requirements and employ best management practices at water crossings?
8. Have especially sensitive habitats and species that may be impacted been flagged to focus monitoring? How will these be protected as needs arise?
9. What are the specific plans to monitor the route?
10. Are there levels of impacts identified that will trigger closures or other actions?

NMW believes that with the volume of increased traffic expected with B2B in some of the most remote parts of the Superior National Forest, there is the virtual certainty that some high impact vehicles will leave the route and travel on roads they shouldn't be on.

Save



Some of these will get stuck or become lost. The potential for motorized trespass into the

dispersed camping sites, increased use of outhouses at entry points (or improper disposal of human waste and toilet paper along the route), the increased threat to wildlife both from collisions between vehicles and animals and from illegal use of firearms, the increased potential for human-caused fires, the inevitability of more calls for First Responders and Search and Rescue - all of these require greater law enforcement presence than DNR, USFS and the counties are currently unable to provide. There is nothing to suggest that situation will improve.

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NMW is also concerned that long term monitoring and enforcement needs, road maintenance costs and mitigation measures will erode recreation and wilderness budgets.

A DNR Parks and Trails supervisor is quoted in that News-Tribune article as saying "You want to give them some decent seat time. ...the more seat time, the better." This is a goal that NMW believes could be adequately met in parts of the SNF further away from the wilderness boundary. A better idea would be to promote less impactful recreational opportunities on SNF and keep this touring route on lands that have already lost a degree of environmental health and wildness that are retained here.

Thank you for your consideration of our comments.

Sincerely,

Ellen Hawkins
NMW Board and Policy Committee Member

Cc: Connie Cummins, Supervisor, Superior National Forest

Description

The Minnesota Department of Natural Resources (DNR) proposes to designate a scenic touring route for highway licensed vehicles (HLVs) stretching from Lake Superior near Silver Bay, MN to the North Dakota border near Pembina, ND, for approximately 765 miles. The touring route will follow existing county, state and Federal forest roads, township roads, county roads/state aid highways and state highways. Only HLVs currently allowed on these roads will be able to travel the Border to Border Touring Route, and the route will not displace or change current uses of these roads. Aside from the installation of signs, the DNR does not anticipate any new construction along the route. In 2019, the Minnesota Legislature appropriated \$200,000 from the ORV account to be used for maintenance along the route specifically related to maintenance needs stemming from the touring route use. Future maintenance needs are unknown at this time.

Comparison to Mandatory Categories

MR 4410.4300 Subp. 37 - Recreational Trails	Mandatory EAW?	Proposed Project
A. New trail \geq 25 miles for use other than snowmobile or x-country ski on forested or naturally vegetated land	No	The touring route is not considered a trail and will follow existing roads. No new construction is planned.
B. New use \geq 25 miles – designated for a new motorized use that expands the treadway other than snowmobile	No	The touring route will be open to HLVs only. The entire route is currently open to HLVs. No expansion or road right-of-ways or surface/treadway widths are proposed.
C. New paving \geq 10 miles of existing unpaved	No	The proposed route will not consist of new paving.

MR 4410.4300 - Other potential categories:	Mandatory EAW?	Proposed Project
Subp. 1 – Threshold test	No	The DNR has not completed any touring routes within the last three years and the proposal is not an extension or an expansion of an existing touring route.
Subp. 22 – Highways	No	Proposed project is not a highway project, no road expansions, no new lanes or road developments are proposed.
Subp. 24 – Water appropriation	No	No water will be appropriated
Subp. 26 – Stream diversion	No	The proposed route crosses several designated trout streams, however the route will utilize existing roads, bridges and culverts to avoid new impacts to streams. No diversions, realignments or channelization of any stream is proposed. Future maintenance needs are unknown at this time. If future maintenance may impact a stream crossing, any necessary environmental review and permitting will be completed at that time.
Subp. 27 – Wetlands and public waters	No	The route will utilize existing roads in wetland area. No new impacts to wetlands are anticipated during project implementation. Future maintenance needs are unknown at this time. If future maintenance may

To: Bill Johnson
Planning Director / EWR Environmental Policy & Review
RE: Environmental Needs Review for the Proposed Border to Border Route
27 May 2020

Dear Bill,

We have read the limited number of Parks and Trails documents made available to us and referred to you for the Environmental Review Needs determination for the proposed Border to Border Touring Route. Based on our own independent research and study of the proposer's plans for the designated route since March 2018, we believe the project may have potential for significant adverse impacts to the environment. We also believe that if completed, the limited funds proposed to be available for monitoring, enforcement, inspection and maintenance of this motorized recreation route is grossly deficient. This inadequate funding and cumbersome local government road damage cost recovery process will exacerbate the potential for longer lasting adverse impacts.

We urge you and your staff to consider our findings and recommendations below. While the project may not qualify for either a mandatory EAW or EIS under EQB rules, we believe there is sufficient reason to find the project may have potential for significant adverse impacts. As such, we encourage you to recommend the preparation of a discretionary EAW designed to further substantiate the potential for significant adverse impacts.

In our review we find the Mn4WD Association's plan and self-assessment to be inadequate, lacking or misleading in the following ways:

First, we find their plan is lacking in analysis, supporting data, metrics and proposed threshold values that would serve to notify and trigger preventive action in advance of environmental damage. To the contrary, their plan relies primarily on reactive monitoring of traffic levels and other subjective, symptomatic indicators that would signal damage only after it occurs.

Second, their plan does not include a thorough assessment of the funding needs or a comprehensive budget for managing the costs associated with properly maintaining a cross-state route of this magnitude. Contrary to their comparisons, a similar cross-state route of this magnitude through sensitive ecosystems and high quality watersheds has never been done in neighboring states such as North Dakota or Wisconsin.

Third, throughout the life of this project, the proposers in our view have cast the project in an overly favorable light, touting the economic benefits (unsupported by meaningful data) while minimizing potential impacts. They have mischaracterized and misstated important facts about the scope and planning of this project that need to be corrected. Project proposers have failed to provide reliable estimates of usage or propose methods by which usage could be predicted for purposes of estimating economic benefits vs. socio-economic and environmental costs.

Fourth, your Department is well aware that this proposal is but the first in a series of similar OHV touring routes already in the early planning stages for Minnesota. The current project is part of a phase or connected action, the impacts of which should be reviewed in their entirety rather than segmented into the lesser impacts of individual but component projects. In your review, the DNR should make a determination as to whether the entire set of routes needs review under these provisions of MEPA and

EQB rules. The impacts of a single component of a larger project may or may not reach the necessary level of significance of impacts but when viewed in context of cumulative impacts of related, phased or connected actions, the overall project may well meet the threshold and may have even greater potential for significant adverse impacts and warrant further review through an EAW.

The intent of our letter is to provide examples supporting our position as stated above and to ensure this information is entered into the record as the environmental review needs assessment is conducted. We ask that in light of the information presented, Mn DNR Ecos and Water proceeds with a discretionary Environmental Assessment Worksheet.

To begin, we want to point out that the submission is lacking any information on the following items which seem to be critical to a proper review:

- A cost/ benefit analysis, that considers both the hard and soft costs associated with the project and its net benefit.
- Realistic recurring cost estimates- training, monitoring, maintenance
- Risk analysis and mitigation plans in the event of unintended consequences
- Invasive species monitoring and management plan for ongoing staff and funding in place
- Review of insufficient buffer zones along the route
- Review of the Exceptionally high quality/value waters (Outstanding Resource Value Waters (ORVW) crossed on unpaved roads by the proposed route
- Review of the Prohibited ORVW waters crossed on unpaved roads by the proposed route
- Alternate Touring Route design and location solutions, given that there is no Legislative mandate to specifically create a Border to Border route.

Below are examples supporting the areas that we take exception to in the proposer's submission and that minimize the scope of this proposed project:

1. Trout streams crossed

The Proposer states that :

"The proposed route crosses several designated trout streams, however the route will utilize existing roads, bridges and culverts to avoid new impacts to streams. No diversions, realignments or channelization of any stream is proposed. Future maintenance needs are unknown at this time. If future maintenance may impact a stream crossing, any necessary environmental review and permitting will be completed at that time."

We Find:

In Lake County alone, 27 MN DNR designated trout streams will be crossed 61 times on unpaved roads. (see attached list)

The MPCA in its Lake Superior North Watershed report noted that there were potentially problematic crossings at 7 sites, one of which, Manitou River, is on the proposed route. The report goes on to state that other road crossings in need of repair and redesign surely exist within the watershed.
<https://www.pca.state.mn.us/sites/default/files/wq-ws3-04010101b.pdf> pg. 156

According to court interpretations of MEPA a reviewing or permitting agency must predict and prevent damages, not wait and see if problems occur and then try to fix them. **And many types of environmental damages may not be mitigable.** The proposer fails to consider the potential cumulative effects of the project and relies on future permitting or monitoring efforts to control or redress potential problems which may not be mitigable.

Further, there is no detailed monitoring plan in place for waters or potentially affected ecosystems along the proposed route and no provisions are made for immediate or ongoing funding for added personnel to execute a monitoring plan.

We believe, that for the proposed route to be considered potentially sustainable, at a minimum, a monitoring plan and threshold action level trigger should be established, in advance of opening the route, that includes access to ongoing funding sources and staff needed to monitor the waters and ecosystems along the route. If a water or ecosystem is threatened or actually degraded, what is the plan? Is the plan to remove a problem segment from the route until restored, if it can indeed be restored? Existing roads cannot simply be closed to local traffic and the roads will still be on Off Roading websites across the nation and will likely continue to be driven. Temporary detours intended to avoid problem segments may well have even greater potential for adverse impacts. Having a monitoring and protection plan in place and reconsidering how BEST to protect our pristine waters BEFORE the route is open, is imperative in our view. A more detailed assessment could result in removing from the route alignment some of our most pristine waters crossed by the proposed designated, nationally advertised route alignment because even temporary remedial closures, longer term detours and damage mitigation and/or restoration mitigation methods may not exist.

2. NO MENTION OF EXCEPTIONAL MPCA RANKED WATERS CROSSED

There is no mention of the Exceptional MPCA (Outstanding Resource Value) waters crossed by the route which the MPCA states in its watershed reports are some of the most pristine waters in the state and deserve special protection strategies.

In Lake County alone, 9 Exceptional MPCA ranked waters would be crossed 24 times.

These waters contain numerous sensitive fish species, high or outstanding species diversity, as well as species listed by Minnesota as being of special concern. These waters are populated with highly sensitive macroinvertebrates and the Boyeria Grafina dragon fly of state listed special concern.

3. NO MENTION OF PROHIBITED WATERS CROSSED

In Lake County alone, 3 Prohibited ORV Waters would be crossed that 8 times.

4. NO MENTION OF THE BWCAW -PROHIBITED WATERS- POTENTIALLY IMPACTED

The Route passes as close as one and one quarter miles to the BWCAW, crossing 16 different streams a total of 29 times.

All these waters flow into the BWCAW. A more detailed ecological assessment is needed to address the risk of sediment pollution, airborne dust deposition and nonnative invasive species introduction from Border to Border Route traffic entering these streams and transported by current into the BWCAW.

5. NO MENTION OF INSUFFICIENT BUFFER ZONES

There is no mention of insufficient buffer zones at stream crossings or elsewhere along the route. (See photos attached for some examples of the route).

The need for and effectiveness of buffer zones of various widths for route segments crossing or paralleling high quality waters, wetlands, lakes and streams as well as for route segments through or near areas identified as having plant communities with outstanding biological diversity should be assessed.

From the Journal of Conservation Planning , Off Road Vehicle Best management Practices for forestlands, it states:

Locate routes a minimum distance (as listed below) from waterbodies and wetlands:

- Fish-bearing streams and lakes – 91 m (300 ft)
- Permanently flowing non-fish-bearing streams – 46 m (150 ft)
- Ponds, reservoirs, and wetlands greater than one acre – 46 m (150ft)

Do not designate new routes requiring stream crossings and prioritize closure, re-routing or creating bridge crossings for existing routes that have stream crossings

https://www.lscohc.leg.mn/materials/16_Mtg/Dec_14_2016_ATV.pdf pg. 15

6. The proposer states :

The route will utilize existing roads in wetland area. No new impacts to wetlands are anticipated during project implementation. Future maintenance needs are unknown at this time. If it appears future maintenance may have an impact on wetlands or public waters, any necessary environmental review or WCA requirements will be fulfilled at that time.

We find:

Again, according to MEPA case law, it is the role of the project reviewer or permitting/funding agency to predict and prevent environmental damage, not wait for it to occur and then attempt to fix it, if it can be fixed or prevented in advance. It is arbitrary and capricious to implement a project with no metrics of predictable potential impact or a threshold trigger provided beyond which the project's impact cannot be allowed or whose impacts cannot be remedied. We believe, a monitoring plan, with a measurable preventive threshold trigger, with staff and an ongoing funding source must be in place for the proposed project to have effective and meaningful environmental protection and to be considered potentially sustainable.

7. The proposer states:

Careful consideration during the planning phase identified existing roads with sufficient infrastructure that do not need any immediate improvements. Generally, county highways and state forest system roads receive a higher level of maintenance. Township roads and state forest minimum maintenance roads receive less maintenance. US Forest Service roads receive maintenance according to their development level. In 2019, the Minnesota Legislature appropriated \$200,000 from the ORV account to be used for maintenance along the route specifically related to maintenance needs stemming from the touring route use.

Our concerns:

a) We share the concerns of the Minnesota Association of Townships who opposes the route based on the insufficient funds of \$ 200,000 and the terms for reimbursement that they found impossible to meet. The Executive Director of the Minnesota Association of Townships called the reimbursement terms that would have to be met, "crazy". (see quote below). This resulted in the draft alignment having to be re-routed to avoid some township roads, but others remain.

Clearwater County also opposed the route with an Official Resolution of Opposition for multiple reasons, one of them being road maintenance reimbursement. (See attached) We were also told this is why Red Lake County opposed the proposed route and like Clearwater, was subsequently dropped from the route.

The fact remains, there is no secure source for future, ongoing funding for road maintenance. The \$200,000 now designated is only available until 2023. The present funding source is not secure. The feasibility of an ongoing source of funding for road maintenance, at a level of funding that is flexible and responsive enough to address unanticipated erosion damage due to increasing climate impacted storm intensity and that is not dependent on a legislative vote every two years, should be evaluated by Mn DNR's internal assessment or by EAW.

Currently the appropriations bill passed for the \$200,000 states for a county or township to be eligible for reimbursement, "the claimant must demonstrate that the needs resulted from additional traffic generated by the border-to-border touring route,". Also the increased use must be attributable to a border-to-border touring route that has caused at least a 50 percent increase in the maintenance cost for roads under the claimant's jurisdiction, based on a 10-year maintenance average.

The Executive Director of the Minnesota Association of Townships, David Hann, was quoted in a 9/1/2019 Cook County News Herald article on the proposed route's maintenance funds and terms. *As to the ability of townships to receive aid to repair roads damaged by vehicles used on the B2B route under the state's new legislation, Hann said the state didn't ask for input from the townships about a plan for reimbursement for repairs, "Which was ridiculous. Townships don't have the ability to track a baseline over many years, this is unworkable. For a township to try to keep track of off-road vehicle use on their roads is crazy. Who's going to pay for the maintenance and repair of those roads? The townships, that's who," he said, adding, "One township just repaired five miles of road at a cost of \$35,000. How far will that \$200,000 go?"*

The next step for the Minnesota Association of Townships, said Hann is, "to try to meet with the commissioner and see if we can slow this thing down or stop it all together."

b) USFS lack of Funds for road maintenance

The proposer states:

US Forest Service roads receive maintenance according to their development level.

We find:

In fact, USFS road maintenance funds have been significantly reduced over the years, in some cases eliminating road maintenance altogether. The Forest acknowledges it no longer feels that at decreased funding levels it can keep roads up to a safe standard for the public.

As the Superior National Forest has stated, The Forest has mostly eliminated expenditure of road maintenance of OML 2 roads, which are on the proposed route, and the reduced amount of funding it receives, is focused on OML 3 and 4 roads.

An example of the significant decrease in USFS road maintenance funds, is the statement made in the 2015 SNF Forest Wide Roads Study Report.

The executive summary, pg. 5, states:

"At the current level, we are not properly able to maintain the road system. At the current funding level, roads cannot be maintained to standard and The Forest is not able to meet the Forest Plan Desired Conditions of providing safe traveling conditions for the public and providing reasonable access to private land and other public lands. The Forest recognizes that the trend of decreasing funding will most likely continue.

Additional funds are needed for bridge replacement and replacement of surfacing on maintenance level 3-5 roads. We currently have a backlog of approximately \$15,000,000 for surfacing replacement. The past few years we have been receiving \$500,000 to \$600,000, approximately 30% of the amount needed."

c) The above statement by the proposer is contradicted by the fact that in Lake County there are an estimated 38.7 miles of low standard USFS OML 2 roads with 10 stream crossings on the proposed route. The current and future lack of funding for maintenance of these roads suggests both current and ongoing insufficient infrastructure including the possibility of problematic stream crossings resulting in degradation of water quality. A Discretionary EAW should include an assessment of all stream crossings and a requirement of the completion of any needed mitigation as a precondition for approval and opening of the proposed Route.

d) More recently, the Covid Pandemic has tossed all future state, local and federal government funding for non-essential transportation maintenance into serious doubt. Without assurances of continuation of existing maintenance funding, let alone future funding expansion to address B2B stresses on the low level transportation infrastructure, the project impacts and the sustainability of the proposed project should be seriously reconsidered.

8. The proposer states:

Although the touring route will follow existing roads with no change in use, the project is not considered reconstruction or rehab of an existing trail.

We find:

The use of single lane OML 2 roads for the proposed route is a change in use. According to the Forest System Roads, OML 2 roads are, "assigned to roads, operated for use by high clearance vehicles. Passenger car is not a consideration. Traffic is usually minor, usually consisting of one of a combination of administrative, permitted (such as log haul), **dispersed recreation**, or other specialized uses. Log haul may occur at this level."

In other words, single lane OML 2 roads suitable for dispersed recreation, were not built for use of a two way designated OHV route, a route that would be nationally advertised and include the potential for significant spikes in traffic by popular jeep jamboree events, such a Jeep Jamboree USA that averages 100 vehicles with 500 passengers per event.

These roads lack proper base, width, shoulders and drainage. They were not engineered and constructed for the use of a two way designated route for highway licensed OHVs that would be

nationally advertised. They were not engineered for water protection measures to mitigate the increased erosion and sedimentation to waters due to the increased traffic of a nationally advertised, designated touring route for highway licensed Off Road Vehicle traffic.

Existing forest service, logging, minimum maintenance and rural farm-to market roads represent what society has deemed as necessary fragmentation of important landscape level habitats or ecosystems. Existing low-intensity non-commercial (recreational) uses of these same roadways also have measurable fragmentation impacts that may well be exacerbated by the type of increased-intensity recreational uses proposed by the project. It is this increase intensity that we contend may be a potentially significant "change in use" and that can and should trigger the higher level of scrutiny of environmental impacts.

9. The proposer states:

The proposed Border to Border Touring Route (B2B) will be a route identified on existing roads intended for use by highway licensed vehicles. The route will provide a rustic experience primarily on low volume, unpaved roads across Northern Minnesota. Wisconsin and North Dakota have successfully developed similar routes and the project's goal is to facilitate a comparable opportunity for people to explore approximately 765 miles from Lake Superior to North Dakota.

We find:

The proposed B2B project is not similar to the routes developed in Wisconsin known as, The Wisconsin Rustic Roads program and cannot accurately be compared to this successful program. Unlike the proposed B2B route, the Wisconsin program is on mostly paved roads and stresses the mission to "preserve what is left of Wisconsin's lightly traveled back roads."

Differences between the projects are:

- a) The Rustic Road program is for hikers, bikers and motorists. The Rustic Roads in Wisconsin dates to 1973 legislation with a mandate " to preserve what is left of Wisconsin' scenic, lightly traveled roads for the leisurely enjoyment of bikers, hikers and motorists."

The proposed B2B, as stated by the proposer's President, Rick Langess of MN4WDA, is an adventure touring route created for highway licensed OHVs. He states on the DNR website:

"The Border-to-Border Touring Route is an opportunity to provide a quality adventure touring and off-road vehicle riding opportunity while assisting smaller, rural communities in northern Minnesota with a positive economic influx. In order to accomplish both those goals, as well as to be sustainable, input from people and communities is important to planning where it will be located. MN4WDA members own highway licensed vehicles that are also ORV registered and want to spend time in Minnesota instead of traveling out of state to tour backroads."

- b) The Wisconsin Rustic Roads program is primarily on paved roads.

The proposed B2B is almost exclusively on unpaved roads, making it much more susceptible to soil erosion and increased sediment load to waters and to the spread of invasive species.

- c) The Rustic Roads program is 120 separate, not contiguous roads, most consisting of segments

between 2-10 miles long. Although the shortest is 1 mile and the longest 40 miles.

The proposed B2B is a continuous 764 mile long route, which facilitates the spread of invasive species along the entire route.

d) The governing body for the Rustic Roads Program is the Wisconsin DOT with expert knowledge of road maintenance and costs.

The governing body for the proposed B2B is the DNR.

10. NO MENTION OF INVASIVE SPECIES ISSUES and MITIGATION MEASURES

The proposer makes no mention of invasive species monitoring and control issues. There is no added funding for invasive species inspection stations, no wash stations and no added professional staff to monitor and control invasive species. Studies show that vehicles that travel great distances on unpaved roads provide significant risk for new invasions. In one study of vehicles and seed accrual, 4 WD accrued 420 seeds per 100 km on dry unpaved roads, and 19.6 fold more on wet unpaved roads, 8,232 seeds. <https://www.sciencedirect.com/science/article/pii/S0301479717310575>

Invasive species spread may present a significant threat of the over the entire 764 mile, mostly unpaved route, that would travel across 4 biomes within Minnesota. The designated, nationally advertised route, is currently on the NOHVCC website, where it also advertised its annual convention in Reno, Nevada (see attached) and would be advertised in the future on the MN DNR and on Off Road club websites and social media around the country. This would attract traffic from around the nation, potentially increasing the spectrum of invasive species spread brought into the state and spread across the northern third of Minnesota.

We find that ongoing annual funding for invasive species monitoring and management along the entire route should be in place prior to the route opening.

DNR- Lack of sufficient funds in The Invasive Species Account

The DNR itself, acknowledges does it does not have adequate funds to monitor and manage invasive species currently. As noted in its 2017 annual report , the projection for the 2018-2021 Invasive Species Account 2018-2021 is a NEGATIVE one million dollars.

The report states:

Forecast- DNR Invasive Species Account:

The fund balance has been declining for many years due to appropriations exceeding revenues. Each year DNR ensures a positive balance by reducing expenditures. <https://www.leg.state.mn.us/docs/2018/other/180619.pdfpg>. 16

11. NO MENTION OF PROBLEMATIC CULVERTS BRIDGES and STREAM CROSSINGS in the project report.

There are however, examples of known problematic culverts at specific stream crossings mentioned in MPCA watershed reports. A more detailed assessment of the numbers, locations and levels of the value and sensitivity of the streams or wetlands to be crossed is needed to gauge the significance of this

potential project impact.

12. The proposer states:

Minnesota vehicle laws will be enforced by county sheriff deputies and DNR conservation officers along the route. The DNR Division of Enforcement plans to provide additional conservation officer time along the route during the first year of operation and as needed after .

Our view and concerns:

Prospects for route use rule enforcement are speculative at this point in the project plan and the concept requires further development and independent investigation to verify assertions. First, B2B route user rules are not yet developed or at least are not known. This should be further explored and provisions made public. Until these enforcement needs are spelled out the various enforcement entities cannot presently gauge the level or type of enforcement that will be needed. For example, many of these segments do not have posted speed limits or safe passing zone signage. Would a collision between passing vehicles and oncoming traffic be subject to enforcement of "unsafe operation" type rules?

The proposer does not state how much time the DNR Division of Enforcement would allot to monitoring the proposed route during the first and subsequent years of route operation and an overall coverage plan for the 764 mile route.

The local enforcement agencies in many counties are already stretched too thin. They do not have the staff or funding to monitor the proposed route in addition to their current duties and responsibilities. The entire 764 mile route would need ongoing enforcement oversight for the safety of citizens and the safety of the users .

We believe it is imperative and in the best interest of the safety of citizens and route users, to have a plan and funding in place for ongoing additional enforcement oversight prior to the route opening.

In opposing the route, Clear Water County also had safety concerns for its citizens.
(see attached)

Cook County's Sheriff also expressed concerns about insufficient staff and funds to monitor the proposed route.

13. The proposer states:

Visitors using the MN Border to Border Touring Route may generate increased traffic to rural/remote segments, but it is not expected to increase significantly. The daily increase is unknown and will be assessed once the route is in place. Forecast travel demand and roadway capacity will be monitored. Being part of the touring route will not supplant or replace any existing uses.

Our concerns:

A declaration of expectation that traffic increases due to the project would not be significant, is meaningless unless the threshold of what actually would be significant is presented and supported by some data and analysis. Lacking a recognizable frame of reference such statements are

arbitrary. Project proposers and advocates offer conflicting level-of-use predictions depending on the criterion being used.

We note that the initial DNR B2B project lead, Mary Straka, estimated a few thousand vehicles in the first year.

She wrote to the Clearwater Lake Association President in a letter dated March 13, 2018:
" The exact amount of increased people and vehicles on the touring route will require monitoring once the route is in place. An estimate may be a few thousand a year to start with on the more attractively marketed segments."

We know from studies that even temporary changes in usage can amount to large differences in road sedimentation, as noted by Reid and Dunno (1984) who compared weekdays to weekend finding a 7.5 rate increase for weekends.

Further, the proposer's comments are in direct conflict with the purpose of the route, which is to bring economic stimulus to counties. If there is not significant traffic, then there cannot be "significant" (rather than sufficient) economic stimulus to justify the route. Again, without a definition of what is or is not significant and comparable metrics for adverse environmental impact and socio-economic benefits, these impacts cannot be compared meaningfully.

Furthermore, all highway licensed vehicles that could use this proposed route *already can and do* access every single road now proposed for special designation by this project, but in a much dispersed, and thus more sustainable manner. This minimal adverse impact level of use also has an economic benefit that is distributed across the region rather than focused on the communities along a single route.

Proponents claim that the B2B route "will not supplant or replace any existing uses" but they do not disclose the nature or extent by which this new use might conflict or interfere with existing uses.

The US Fish and Wildlife Service, in a letter to DNR in 2017, noted their specific concerns about this type of focused use by a certain segment of the motorized tourist industry:

"The service recognizes that the intent of the trail is for light trucks and jeep-type vehicles, however, current state designation of off-road vehicles (ORV) is much broader and may include certain Utility Task Vehicles (UTV). While most public roads on or near the refuge system lands are open to licensed motor vehicle traffic, ***designation of a trail has the potential to increase visitor conflict by substantially increasing traffic and consolidating travelers into larger packs or caravans.***

It went on to note that, " Careful planning and foresight will be imperative to avoid potential conflicts." (see attached letter)

14. NO MENTION OF POTENTIAL ENVIRONMENTAL IMPACTS FROM LARGE GROUP OHV CLUB EVENTS IN REMOTE AREAS INTENDED FOR DISPERSED RECREATION:

Potential impacts:

- a)** With many vehicles concentrated together, increased problems of vehicles passing one another on single lane roads resulting in roadside damage, vegetation damage, stream buffer damage and increased sediment erosion and pollution into streams crossed.
- b)** Noise pollution: The cumulative increased noise level of numerous vehicles traveling together, even though each vehicle may be in compliance with applicable noise standards, carrying into the BWCAW.

(As close as one and one quarter miles from the proposed Route.)

- c) Conflict with other Users engaged in dispersed silent-sport recreation and expecting a quiet outdoor experience.
- d) Lack of facilities, bathrooms etc. in remote locations for large OHV Club Events, resulting in human waste pollution and garbage in relatively pristine settings.
- e) Increased forest fire risk in remote areas from OHV Club events with large numbers of vehicles and participants.
- f) Increased stress on capacity of local emergency response personnel to locate and extricate seriously ill or injured persons along the route, should be assessed.

15. NO MENTION OF CLIMATE CHANGE CONSIDERATIONS

Climate change exacerbation is a significant factor in reviewing the proposed route and impacted natural resources: extreme rain events, as well as prolonged dry spells are occurring with more frequency in Northeastern Minnesota as climate change occurs. This factor intensifies the anticipated environmental impacts; in particular rutting, increased run off, soil erosion and sedimentation and fugitive dust pollution to waters.

Some roads, such as the OML 2 ones on the proposed route are normally closed, or should be, during unseasonably wet periods according to the Forest- Wide Travel Management Project.

There is no plan in place to manage these closings.

The greatest sediment yields occur when trails are wet. (Wilson and Seney 1994).

OML 2 roads are considered summer seasonal roads and should be closed during unseasonably wet weather periods according to the Forest-Wide Travel Management Project.

16. NO MENTION OF INCREASED FOREST FIRE RISK AND ADDED RESOURCES NEEDED IN REMOTE FOREST AREAS OF THE ROUTE:

When the Route was under consideration in Cook County, the Cook County Sheriff raised this as one of his concerns. The alignment skirted wilderness areas that are a fire concern risk with current low levels of traffic. Other counties on the proposed Route have similar Boreal Forest landscape. Emergency response medical or fire crews may encounter B2B enhanced traffic congestion and even route blockage should an incident occur while a OHV Club or other event is underway.

Thank you, Bill, for your time and consideration in reviewing this information which presents environmental impact concerns that we believe warrant Ecos and Water undertaking a discretionary Environmental Assessment Worksheet for the proposed Border to Border Route.

Please don't hesitate to contact us for any further clarification or input.

Best,

Mike Hofer
Don Pietrick
Susan Schubert
On behalf of Citizens for Sustainable Off Roading



[Issue Index](#)

January–February 2019

From the editor

Silver Linings Playbook

Unable to sleep one night last fall, I reached for my bedside stand and did the thing you should never do at 3 a.m.: check the news. In the cold glow of Twitter came a warning call. According to the World Wildlife Fund, global vertebrate populations declined by an average of 60 percent between 1970 and 2014. Don't click the link, I thought. You'll never fall asleep if you click the link.

I clicked the link. In the guts of the report, I learned that WWF had based its findings on the Living Planet Index, which is sort of like Nasdaq for biologists. Managed by the Zoological Society of London, the index aggregates government research, online databases, and other survey data to measure population abundance in thousands of animal species worldwide.

Doc/E-215 Z-

WWF found that the most commonly reported threat to wildlife was habitat destruction. The picture was especially grim in Central and South America, where deforestation and other human activities had led to a nearly 90 percent decline in mammals, birds, fish, reptiles, and amphibians.

When I'd had enough, I put my phone away and stared at a small crack in the ceiling. If only our fragile ecosystems could be so easily patched, I thought. If only my two kids, who were fast asleep across the hall, didn't have to inherit this mess. If only I hadn't drunk that coffee after lunch.

A few weeks later, in a more sensible state of mind, I met with staffers from the DNR's Minnesota Biological Survey. "Talk me off the ledge," I said. "How accurate are studies like the World Wildlife Fund report?"

"I'm not sure I can help you," said program supervisor Bruce Carlson. "They're usually in the ballpark."

I asked the MBS team how they stayed sane in the face of serious environmental challenges. "When we share our data, we start with the dire news," said Hannah Texler, an ecologist and botanist who specializes in plant surveys. "But then we make it positive. Yes, we have lost a lot of native habitat in Minnesota. But we can use our data to help preserve what's left."

Texler's pragmatism felt like cold water to the face, a reminder to celebrate and protect what we still have, and to not get too bogged down in the headlines. Lucky for us Minnesotans, there's plenty to cheer for. Like the fact that you can ice fish right in Duluth harbor. Or ski in the same state park where an Olympian once trained. Or forage for fiddleheads in the spring, seal them in brine, then enjoy them year round.

And let's give a special New Year's toast to the miracle on ice known as the headwaters chironomid caddisfly. This mysterious little insect thrives in winter and has been observed scuttling across the snow in northern Minnesota, an image I find oddly inspiring. But as with so many things in nature, the sheer fact of a cold-weather caddisfly is infinitely more interesting than whatever metaphor we might graft onto it. The fact of a cold-weather caddisfly is reason enough to take a break from the news, put away our phones, and appreciate the wonders around us.

Chris Clayton, editor in chief



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NOHVCC MANAGEMENT SOLUTIONS



MINNESOTA
DEPARTMENT OF
NATURAL
RESOURCES

Parks and Trails Division

Border to Border Trail Project
Adventure Touring Route

JUNE 2018



DRAFT

During the open comment period, the MN DNR received 8 resolutions from local units of government, 44 comments submitted during the listening sessions, and 49 comments mailed or e-mailed. The team reviewed and categorized the comments, then prepared a comment response document which the MN DNR sent to the people who had sent in comments and provided an address or e-mail address. Subsequently 3 counties and 1 township association asked the team to attend meetings to provide additional information. Comments continued to be received well beyond the stated 30-day comment period.

The MN DNR has been provided with copies of the comment sheets gathered and indexed, and the comment categorization document. Indexed comments for the second set of sessions are located in Appendix F. The comment categories and data are located in Appendix B.

The team will review, on-the-ground, the route change suggestions received during the second set of listening sessions. The potential route will then be adjusted as necessary and submitted to the MN DNR.

Products Deliverables

The adventure touring trail deliverables will have two components. The first shall be the creation of an east to west adventure touring trail including the planning and identification of an ORV adventure touring trail connecting the eastern Minnesota border to the western Minnesota border in the northern third of Minnesota. The second shall be the creation of a south to north adventure touring trail including a map of existing routes, mostly on gravel roads running between central Minnesota to northern Minnesota, connect to, or near, International Falls then heading southeast to Ely and connecting to the Border to Border alignment, for ORV adventure touring. Although the end-product will be 2 distinct routes, the team will approach the project as one full route with 2 sections or branches of the route.

It should be noted that primary benefactors of this route are off-road enthusiasts. There are secondary recreational beneficiaries including adventure motorcycle riders or any other enthusiast with a highway-licensed vehicle that can traverse the route. Many of these routes are currently open to Class 1 and/or Class 2 ATVs; this use would not be changed or impacted by this ORV adventure route; nor would any other current use change by the route designations. It is a route for highway licensed vehicles on routes currently open to highway licensed vehicles. The proposed route would have many sections that would be closed during the winter to accommodate snowmobiling, especially in State and National Forests.

The primary goal for the route is to create an enjoyable recreational experience for people who seeking recreation by traversing natural surface or gravel routes to explore northern Minnesota's natural environment, cultural and historic resources, and small towns. The secondary goal for the route is to provide additional tourism dollars and a positive economic benefit to the small towns and communities in the northern portion of Minnesota.

August 3 2020

Dear Commissioner Strommen :

We understand from the DNR lead on the proposed Border to Border route, Andrew Brown, that the DNR is now considering an environmental review of the route.

Because the route is on existing roads, it did not trigger a mandatory environmental review. We requested a Discretionary Environmental Review from DNR Ecos and Water, however, we have had no response.

Our intention in sending you this letter is to bring to your attention the serious environmental concerns, as well as the planning and funding shortcomings of the proposal, that, in our view and without reservation, make this proposed route unsustainable.

The reality is, every vehicle that could access this designated, proposed route, can already access every single road in a dispersed, sustainable manner.

Our group has been following the route proposal and its potential environmental and wildlife impacts closely since March 2018 . As stated by the Minnesota Four Wheel Drive Association in legislative testimony in March 2019, the proposed Border to Border route is the first of 20 such routes in the MN4WDA pipeline. Therefore, we feel it is imperative that this initial route, which would be a prototype for more to follow, is carefully studied with a comprehensive plan enacted that addresses and prevents environmental impacts such as water quality degradation, invasive species spread, impacts to areas of significant biodiversity, conservation prioritization areas and impacts to endangered, threatened and protected species. There are also environmental and user conflict risk concerns regarding the BWCAW mentioned below.

Prevention is the standard established through MEPA, yet the route planners and sponsors have presented no evidence that they have studied and understand the risks, leading indicators, and have established thresholds for triggering action before damage occurs.

The reality is, that due to national promotion via the internet through off roading club websites and social media, once the route is opened it will be impossible to put back into the can. It is already posted on the National Off Highway Vehicle Conservation Council website out of Great Falls, Montana. (See photo attached)

We are aware that Representative John Persell, Chair of the House Environment and Natural Resources Policy Committee, wrote to the DNR and MPCA Commissioners in June 2020 regarding environmental concerns with the proposed B2B and asked what alternative options with less environmental impact risk had been reviewed. We wholly agree with this question and can find no evidence the project proposers have considered other options of this endeavor that keep in mind *all* stakeholders. There is no legislative mandate that requires a border to border route per se. The 2015 legislative directive reads: "to address off-road vehicle touring routes and other issues related to off-road vehicle activities."

Representative Persell's letter is attached for reference.

The Minnesota DNR Parks and Trails proposal fails to provide important facts about the scope of the project, environmental risks, and guaranteed long term funding that are critical to effective implementation and management of the route.

Attached is both a copy of the DNR Parks and Trails proposal (2 pdfs) and our letter to the DNR Ecos and Water reviewer Bill Johnson, in response to the proposal, that presents many of the environmental concerns with the proposed route. In this letter to Mr. Johnson, we seek to specifically correct misinformation about the route and highlight the lack of thoughtful analysis and planning in conceiving this project. We believe it's important to bring this information to your attention as you review and consider the impact this project would have on some of the State's most pristine waters and most sensitive aquatic and terrestrial habitats.

As an example, considering the invasive species issue alone, with no provision for wash stations, no added staff for monitoring or management of

the designated 764 mile route, the potential for habitat degradation and ultimately ecosystem destruction in the years ahead, is very real. Both the USFS and the DNR invasive species accounts do not have sufficient funds to manage current invasive infestations, let alone an increased spread across the entire state from high impact vehicles that can and do go off road.

Just two of the broad points the Parks and Trails proposal misrepresents about the route are:

- 1) A very blatant misstatement that says the proposed route would cross **several trout streams**. As the alignment stands, in Lake County alone, the proposed route would cross **27 designated trout streams 61 times**. There is no mention of the 9 Exceptional MPCA ranked streams crossed 24 times, or the 3 Prohibited Waters crossed 8 times, all on unpaved roads and many with minimal buffer zones. (See trout stream list attached)
- 2) We also disagree with the statement there is no change in use of the roads.

Using Forest Service OML2 roads for a designated, nationally advertised route for high impact vehicles on roads that were never intended for that purpose is a change in use. These roads lack the width, shoulders and drainage required for a designated, two way route and are classified by the Forest Travel System for minor traffic and dispersed recreation. Referring to Forest Service Roads in its own documents the Forest Service has indicated that "some roads are not constructed," which is indicative that these roads may not be adequately constructed to prevent environmental degradation at stream crossings resulting from increased Border to Border Route traffic. It is also misleading and incorrect to consider unconstructed unmaintained roads as equivalent with "existing roads" on the proposed Route, which are constructed to various levels of a higher standard, receive some degree of maintenance and can lessen some environmental impact damage.

DNR Andrew Brown generously shared with us the list of some USFS concerns that came to him from USFS personnel who work on the project. One of the concerns relates to the volume of traffic and states that an increase of 5 cars a day could be a large impact on some really low use roads

on the proposed route. There are other concerns listed by USFS staff that we also share regarding who would enforce seasonal closures, who would deal with storm related events and concerns about the cumulative effects and financial commitments needed for the long term, many years out.

The initial lead on the B2B project, DNR Mary Straka, wrote to the Clearwater Lake Area Association President in March 2018 about traffic estimates that, "An estimate may be a few thousand a year to start with on the more attractively marketed segments."

Although this proposed route is on existing roads, they are almost exclusively unpaved and include a variety of road types, including the unmaintained ones. Many of the roads have historically low traffic volume and were built long before the science of road ecology or environmental impact concerns. These roads, even *some OML3 and 4 roads*, lack shoulders, good drainage and have insufficient buffer zones. It is the increased intensity of high impact recreational traffic that we contend may be a potentially significant "change in use" and that can and should trigger the higher level of scrutiny of environmental impacts. (See photos attached)

We also feel strongly the proposed route is not a good environmental fit for the BWCAW area for several important reasons. The proposed route would come within 1-2 miles, carrying the risk of increased noise pollution from OHV caravans and would cross waters on unpaved roads that lead into the BWCAW, risking sedimentation, fugitive dust pollution and invasive species. The popular Jeep Jamboree USA, for example, averages 100 vehicles with 500 passengers per event.

Increased OHV traffic to the BWCAW area would mean increased fire risk to an area already monitored for wildfire risk with the current traffic level. As the USFS itself importantly states, vehicles cause more acreage burned than any other equipment.

In addition, due to the lack of facilities in the remote area and the proximity of the proposed Route to the BWCAW, there is the likelihood of increased traffic to BWCAW Entry Points overwhelming facilities scaled and intended for

BWCAW canoeists. Border to Border traffic near the BWCAW and Entry Points risks significant User Conflict concerns.

There are many who have opposed the route citing concerns that we are bringing to your attention. Clearwater County issued an Official Resolution of Opposition and like Red Lake County and the Minnesota Association of Townships, opposed the route in large part due to insufficient funding and almost impossible terms to meet for road maintenance reimbursement. The proposed route is avoiding those Counties and also had to be re-routed around township roads.

Cook County also had remaining unanswered questions about long term funding, fire risk, added oversight personnel, emergency services, invasive species management, soil erosion, rutting , and runoff to waters and more. These questions went unanswered, however, when the Minnesota Four Wheel Drive Association informed the County Commissioners that Cook County was being dropped from the route to expedite the process.

Grand Portage Reservation also asked not to be included in the route due to environmental impact concerns.

Both The Sierra Club, as well as all 16 state chapters of the Izaak Walton League also opposed the Route.

(See letters attached)

The US Fish and Wildlife wrote the DNR in 2017 about their concerns of a designated route resulting in consolidating travelers into packs and caravans and user conflict.

(See letter attached)

Thank you Commissioner Strommen for your time and consideration.
If you have any questions please don't hesitate to let us know.

Sincerely,

Mike Hofer
Don Pietrick
Susan Schubert
Citizens for Sustained Off Roading

MR 4410.4300 - Other potential categories:	Mandatory EAW?	Proposed Project
		have an impact on wetlands or public waters, any necessary environmental review or WCA requirements will be fulfilled at that time.
Subp. 28 – Forestry	No	No timber will be harvested for the route.
Subp. 30 – Natural areas	No	The touring route will follow existing MNDOT highways within the statutory boundaries of Lake Vermillion-Soudan Underground Mine State Park and the Red Lake Peatland SNA. The touring route will also follow a county highway through Lake Bronson State Park. The touring route will be limited to these existing roads and will only be open to vehicles that are currently permitted to use the roads. Signage within these natural areas will be consistent with the management plan for the sites. Parks and Trails staff have consulted site managers and the proposed route remains consistent with all applicable management plans.
Subp. 31 - Historic Places	No	No historical places or properties will be impacted by the proposed project.
Subp. 36 – Land Conversions in Shoreland	No	No permanent land conversions in shorelands will result from this project.

Comparison to Exemptions

4410.4600 – Exemptions	Exempt?	Proposed Project
Subp. 2 A – No approvals	No	Final DNR approval required.
Subp. 2 B – All decisions made	No	Final decisions have not been made.
Subp. 2 C – Permit denied	No	No permits have been denied.
Subp. 2 D – Project substantially complete	No	Project not yet started.
Subp. 2 E – Environmental Review completed	No	Environmental Review has not been completed.
Subp. 27 A – Rerouting < 1 continuous mile for safety or environmental sensitivity concerns.	No	Project is not a reroute.
Subp. 27 B – Reconstruction, rehab, etc. of existing trail, no change in use	No	Although the touring route will follow existing roads with no change in use, the project is not considered reconstruction or rehab of an existing trail.
Subp. 27 C,D,E – winter only use	No	Project is not winter use only,
Subp. 27 F – non-motorized, Twin Cities Metro	No	Project is motorized, outside the Twin Cities Metro.
Subp. 27 H – New motorized use to an existing motorized trail or trail segment located only on an abandoned railroad grade	No	Project will not be located only on an abandoned railroad grade.

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see page 3

COOK COUNTY NEWS Herald



Border to Border Touring Route will start in Lake County

February 21, 2020

Brian Larsen

Minnesota Department of Natural Resources (DNR) Project Manager Andrew Brown skipped the Cook County Commissioners “Committee of the Whole” meeting on Tuesday, February 18, saying, “As for my canceled update today, I really didn’t have much to say regarding the project that hasn’t been said already.”

Brown has taken the lead on the Border-to- Border Touring route that will run through the back roads of the northern tier of Minnesota counties to North Dakota.

Cook County has been on the planned route from the start, but there has been opposition to the B2B. In the end, that opposition caused The Minnesota Four Wheel Drive Association (MN4WDA) President Rick Langness to contact the Cook County Commissioners and announce, “This is to inform you that developments have occurred making it necessary to convey we are no longer interested in partnering with Cook County on the Border-to-Border Touring Route.”

“While we appreciate the nearly two years of rigorous attention and effort we’ve devoted to this issue in your county, and the invitation to continue working with you to provide additional planning and process, we feel we owe it to our members and to our other partners along the route to move forward. That is why we are excited to let you know we recently reached out to Lake County leaders, who approved a B2B Route trail head alignment in Silver Bay – on the same day they were approached. The MN4WDA board decision to cease partnership was unanimous.

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“While we regret we will not be partnering on the project as part of the official alignment, we do plan on taking the advice of the many citizens who reminded us of the rugged backroads of your beautiful county that are already open to touring riders as legal roads for highway licensed drivers.

“The Cook County Board and staff should get recognition for the effort that was put into considering the B2B. Commissioner Bobby Deschampe deserves high-praise for his support of the project, and special recognition goes to Commissioner Heidi Doo-Kirk for her spirited, thoughtful, and measured leadership in support of the B2B, often under difficult circumstances.”

As far as the DNR’s role in the B2B, Brown said the decision by MN4WDA to move the route-head to Lake County leaves Cook County in limbo.

“I’m not sure yet what that means for the Border-to Border Route in Cook County,” said Brown.

“The Minnesota DNR will be reviewing the project alignment to determine if it triggers an environmental review through Minnesota rules. Once that process is completed, we will be working with partner road authorities to formalize the route and develop agreements for signs, maintenance, monitoring, etc. Ultimately MN4WDA is the group funding the project and has made the decision to adjust the route out of Cook County and move forward.”

The Border-to-Border Off-Road Vehicle Trail (Route) is the largest and most ambitious off-road vehicle trail project in Minnesota history.

When decided, the route will link existing state and national forest roads— as well as township and county minimum-maintenance roads. This route and its connecting spurs will be available for any highway licensed vehicle to use.

The Minnesota Department of Natural Resources, Division of Parks and Trails, has partnered with the National Off-Highway Vehicle Conservation Council (NOHVCC) and Minnesota Four- Wheel Drive Association (MN4WDA) to develop a route from the border of North Dakota to the Tip of the Arrowhead:

Detractors of the route say that bringing larger vehicles in large numbers to minimally maintained, unpaved roads with low volume traffic would enable access to some of our most fragile aquatic and terrestrial habitats, potentially endangering wetlands, waterways, and roadways.

Proponents contend numbers will be determined by the effort local partners put into marketing their areas and cite increased tourist dollars and compliance with DNR, USFS, and county outreach plans to bring new and diverse user groups to the outdoors as benefits of the B2B.

Langness said the decision to omit Cook County at this time was both a financial and a timing issue.

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“We need to get the final alignment route approved by the DNR so they can do their environmental review, post signs, and we can get the course open and ready for summer use.”

“Our members have been firm on one guiding principal from the very beginning,” he added. “We will not invest in areas where we are not welcome.”

“A lot of people have been looking forward to the route opening. We had to make a decision. We’re in the fourth year of an alignment project for highway licensed vehicles on roads that already exist – five if you count the enabling legislation. Pretty non-controversial. But we just spent two years bogged-down in Cook County on an alignment that should have been operational last year. We spent time and money last year fighting your local opposition group who hired a lobbyist to kill a three-point bill to use our ORV fund revenue to make it better for our local government partners. It authorized a B2B administrator so locals had a decision maker one phone call away, a maintenance fund to address impacts to the low volume roads locals were concerned about, and a first-of-it’s kind statewide master plan, to make sure we built strong communication and efficiencies with local governments.”

“Can you tell me why anyone would want to kill a bill like that and make it worse for the rest of our partners? We made the call to Lake County leaders and had support in one day. Our members have moved on, both strategically and emotionally.”

With the project moving forward, Langness said officials from North Dakota had sent his club an email saying they are excited for the route to come to their state.

“North Dakota is looking at making a B2B route that joins ours, and Montana is looking at what North Dakota is going to do. Wisconsin already has a system they call “rustic roads. Ultimately we would like the route to go all the way to the West Coast.”

When asked who will use the B2B, Langness said anyone who owns a Jeep, Land Rover, Subaru, or other all-wheel drive vehicle. “People quit buying sedans 10 years-ago, and they are looking for adventure riding opportunities. The B2B is one project of 20 that are currently in our queue. Touring routes are the next big thing in outdoor recreation,” he said.

“This route is just phase one of a two-phase project. The goal is to work with local governments who will bring us ideas on where to build loops that will attract wheelers to their area.”

As for being open to future consideration he said, “We’re still coming to Cook County. Make no mistake about that. But they’ve lost access to the administrator and maintenance funds because there is zero interest on my board to include them in the B2B alignment. That’s what the opposition up there got you. The MN4WDA will not invest in areas we are not welcome.”

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IT'S YOUR RESPONSIBILITY TO KNOW THE RULES & REGULATIONS

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Border To Border Off-Road Vehicle Touring Trail

Below are frequently asked questions regarding Minnesota's Border To Border Off-Road Vehicle Touring Trail (B2B trail).
Collapse all

B2B FAQ

→ **input**

- Q. How did this project begin?
A. The 2015 Minnesota State Legislature has mandated the creation of two off-road vehicle (ORV) adventure touring trail systems
- Q. Is the funding for this project coming from the general fund or competing with other trails project?
A. No. The Minnesota 4-Wheel Drive Association requested the funding for this project be taken from the account dedicated to registered off-road vehicles.
- Q. Who is in charge of this project?
A. The Department of Natural Resources, Parks and Trails Division was given oversight of this project. The Department hired the National Off-Highway Vehicle Conservation Council (NOHVCC) to manage the project with the cooperation of the Minnesota 4-Wheel Drive Association.
- Q. What is considered an ORV?
A. An ORV is a 4-wheel drive vehicle with a weight of over 2,000lbs. An example would be a jeep or light truck. Off-road vehicle does not include a snowmobile or an all-terrain vehicle, etc.
- Q. What is the purpose of this trail system?
A. The purpose is to provide an entertaining and challenging outing for enthusiasts of licensed four-wheel drive vehicles or off-road registered vehicles in addition to supporting connections to communities, amenities, scenic, cultural and historic features, while increasing awareness of ORVs.
- Q. Does the public have any input in where the trails will be?
A. Yes. There will be public meetings in each of the counties where the trail may possibly be designated. The purpose of these meetings is to gather local input regarding the best possible routes as well as areas which would not work well. The information gathered during these meetings will be incorporated into a draft design which will also have public input.
- Q. Are there maps of the proposed route?
A. No. Prior to developing a draft design, local input will be gathered from a series of meetings with stakeholders in each potential county.
- Q. How can I receive up to date information about the project?
A. You can request to be on a notification list by sending an e-mail to Ron Potter, NOHVCC Management Solutions at ron@nohvcc.org or to the MN DNR, attention Mary Straka at mary.straka@mn.state.us.
- Q. Would this trail be open to OHM's - off highway motorcycles?
A. The primary purpose of the B2B trail is for ORVs (such as jeeps or other light trucks). Most of the route will be along public access road which require a highway license. If an OHM is licensed as a dual-sport motorcycles, it will be able to use the portions of the designated route open to other highway licensed vehicles.
- Q. How will these trails impact forest roads?
A. These trail will cause minimal impact to forest roads. The trail system will be for touring the area at lower rates of speed. The preferred paths will be routes with minimum maintenance to increase the enjoyment of the route.
- Q. When you say "four-wheel drive enthusiasts," does that mean 4-wheel drive pickups and the like, or for four-wheelers as in ATVs?
A. In Minnesota, an off-road vehicle (ORV) is a 4-wheel drive vehicle which is greater than 2,000lbs. While some larger recreational off-highway vehicles (ROV, also called side by side or UTV) may fit into the definition, it is primarily reserved for light trucks or jeep-type vehicles. A traditional straddle ATV is not an ORV.
- Q. Will County Roads be a part of the trail?
A. For the B2B trail we are most interested in dual-track dirt roads and other minimum maintenance routes, but some county road connections to communities, lodging, and campgrounds will be of interest too.
- Q. Will this trail be utilizing downtowns at all?
A. The goal of the trail is for adventure tourism, keeping the majority of the trails and designated routes on gravel or minimum maintenance routes. In order to connect nearby communities with the trail, some other routes will be added for the connections. However, the trail is not intended to be run through the middle of a community.
- Q. Do you have a website that shows where this trail will go?
A. A web page will be created for the project on the NOHVCC website at www.nohvcc.org/b2b. Once a draft route is created, the route will be posted, along with other information, onto that web page. Information and links to the planning will also be available at the MN DNR website page at http://www.dnr.state.mn.us/input/mgmtplans/orv/plans/border_to_border_trail.html
- Q. Is this trail is going to allow ATV usage or is it going to be for 4X4 vehicles only?
A. The primary purpose of the B2B trail is for ORVs (such as jeeps or other light trucks). Most of the route will be along public access roads which require a highway license. If the public road allows ATVs to use those roads, then ATVs will be allowed on those portions of the designated route. This project will not open any new roads to ATVs which are not already designated for that use.
- Q. Is it solely intended for four-wheel-drive ORVs, or can ATVs and dual-sport/adventure motorcycles run it as well?
A. The primary purpose of the B2B trail is for ORVs (such as jeeps or other light trucks). Most of the route will be along public access roads which require a highway license. Some of the route areas will be trails or loops limited to ORVs. If the public road allows ATVs or dual-sport motorcycles, those vehicles will be able to use those open portions of the designated route.

Creating a Positive Future for Off-Highway Vehicle Recreation

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427 Central Ave. West, Great Falls, MT 59404
Ph: 800-348-8427 | Fax: 406-454-4442 | info@nohvcc.org
The NOHVCC is a 501(c)(3) Not-For-Profit Foundation



Tools | Education | Materials | About Us | Contacts

Doc 5 -222-

TAKE THE ROAD LESS TRAVELED.

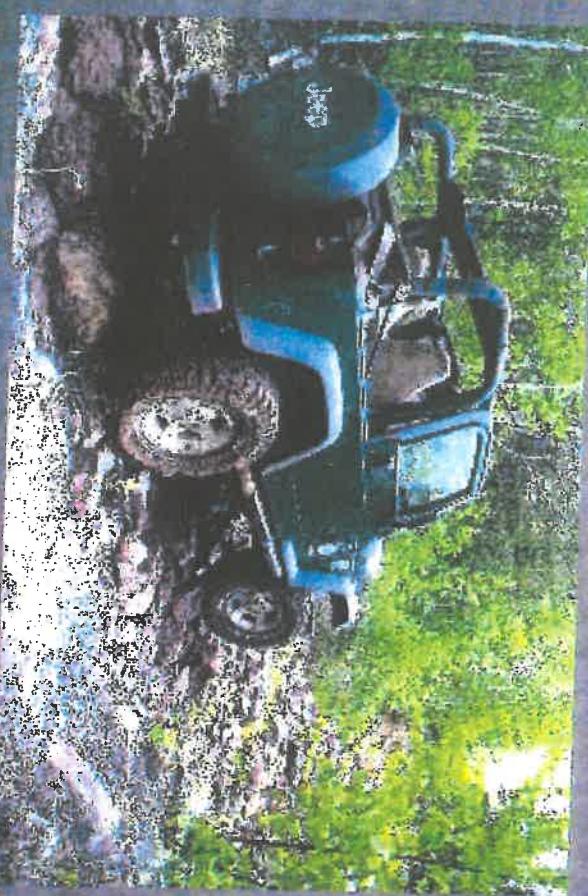
(WELL, TECHNICALLY IT'S MORE OF A TRAIL.)



005 - 223-

Border to Border Trail System

A Rustic Byway



0005 - 224-

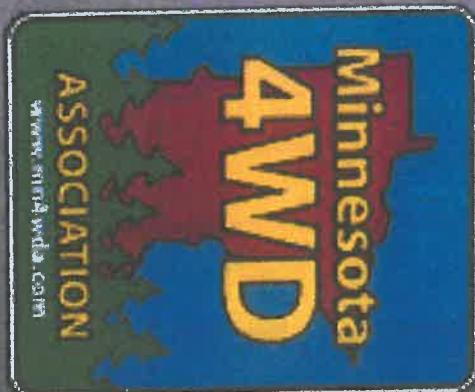
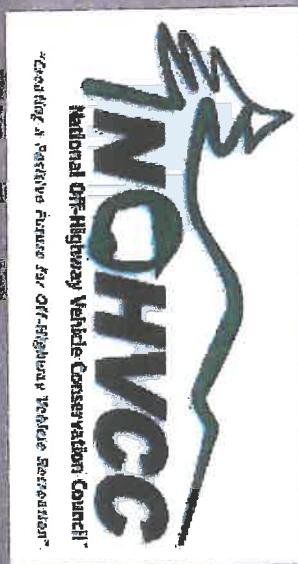
Contacts:

Ron@nohvcc.org

Mary.Straka@state.mn.us

Online input:

<https://www.surveymonkey.com/r/MN-B2B-1>



www.nohvcc.org

DRA

0x 5-225-

Implementation

- The MN DNR and MN4WDA will create implementation plan
- Intent to make this part of Grant-In-Aid (GIA) route.
- Allow dedicated funds to be used in creation and maintenance of route
- Allow Trail Ambassadors to 'patrol'



Next Steps

- Look for a potential route
- Create a draft of the route
 - Gather input regarding draft route
 - Hold a second round of meetings in the potential counties
 - Gather input on-line
- Look for connections into communities for services
- Create final alignment
 - Create map files for final alignment
- This portion of project to be completed by June 30, 2018.



Attributes of Potential Routes

Doc 5 - 227

- Minimum maintenance routes
- Rugged routes
- Unpaved surfaces
- Forest roads



Process

- All we know:
 - The route will go from the western border to eastern border.
 - It will take place in the northern third of the state.
 - This first round will on routes currently open to highway licensed vehicles.
- First Steps
 - Having meetings with the stakeholders or interested parties to gather input.
 - Possible routes into communities
 - Potential for creating additional loops and other opportunities

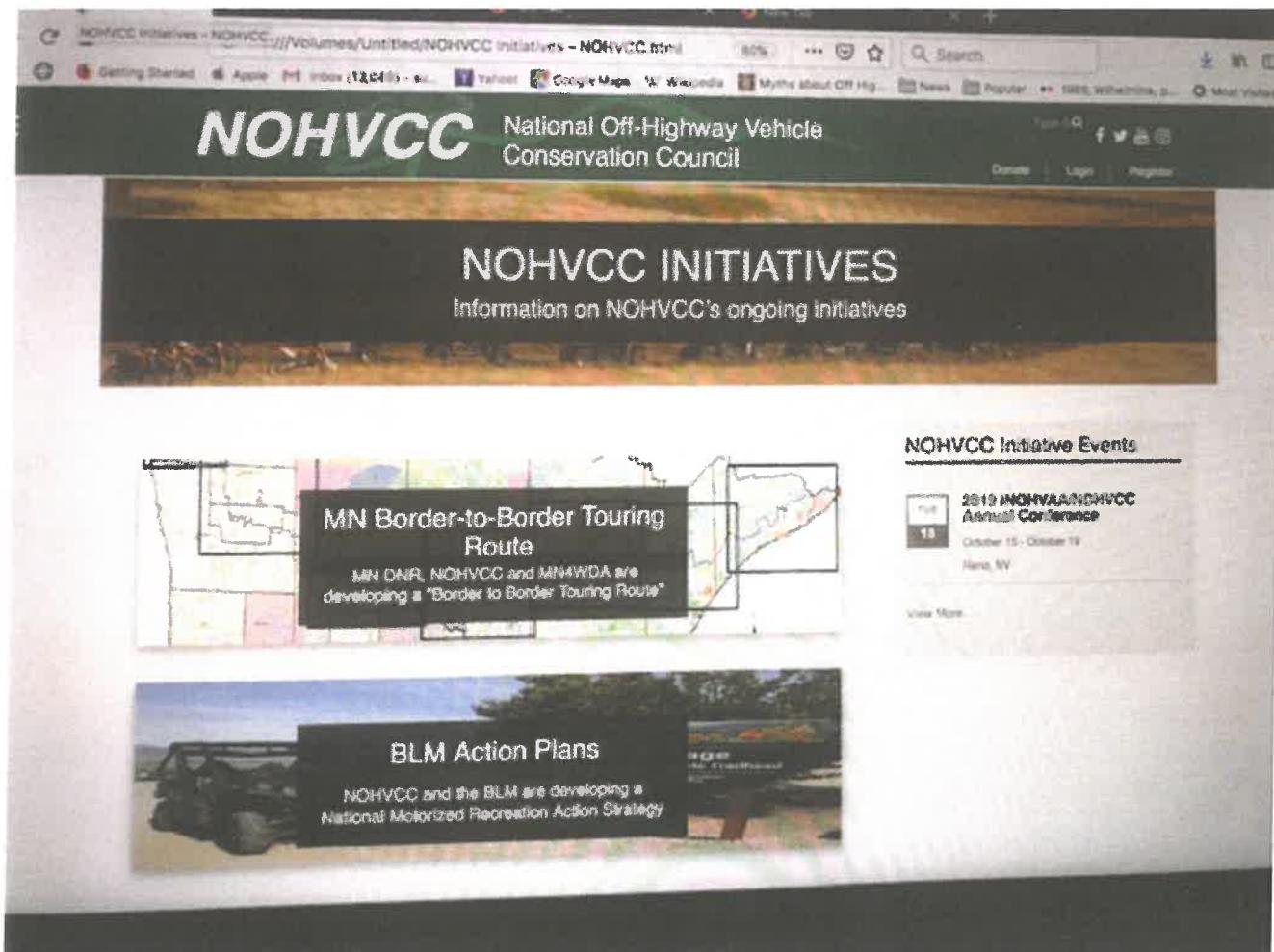
Project

DRIVE



- The Origins
 - MN4WDA asked the legislature to move some funding from the ORV dedicated account for this account.
 - Funds for this account are from registration fees and unrefunded gas taxes.
- The legislature moved \$150,000 and mandated the project.
- The project players:
 - The MN DNR was given the administration of the project.
 - The MN DNR hired NOHVCC to manage the project.
 - The MN4WDA is a partner in the project.

Doc 5A -230-



<https://www.duluthnewstribune.com/sports/outdoors/6553132-New-Prospector-ATV-spur-joins-growing-Northland-trail-network>

New Prospector ATV spur joins growing Northland trail network

As ATV riding grows in popularity, demand is increasing for interconnected trails across northern Minnesota.

Written By: John Myers | Jul 5th 2020 - 6am.

See pg. 73
for quote

â€œItâ€™s amazing how fast people find these trails, even before we put the word out. Thatâ€™s how much people are looking for good places to ride,â€™ said Ron Potter as he navigated his Polaris RZR side-by-side ATV along this new spur of the Prospector ATV trail system.

Potter, who lives just outside Ely, knows his ATV stuff. He retired from the Minnesota Department of Natural Resources after 37 years, ending his career as program planner for the stateâ€™s trail systems. Now, Potter is not only president of the Prospector ATV Club but serves as president of the statewide All Terrain Vehicle Association of Minnesota, the umbrella group for all the stateâ€™s off-roading clubs. Potter also is working for Polaris Industries, expanding a free smartphone application that riders can use to see the most-updated maps of new trail systems.

Prospectors Trail Alliance Coordinator Ron Potter drives a section of trail near Finland recently. (Steve Kuchera / skuchera@duluthnews.com)

â€œEvery time we get a new segment of trail done like this, itâ€™s an accomplishment. A lot of people had to work together to make this happen,â€™ he said.

On a warm, breezy weekday we rode 25 miles from the Wildhurst Lodge near Finland to the Trestle Inn on Crooked Lake, a 50-mile round trip, on the new spur of the developing 250-mile Prospector trail system. The trail meanders through varied hardwood and pine forests, alternating between existing snowmobile trails, two-rut logging trails, official Superior National Forest gravel roads and all-new ATV-only segments.

It was one of those classic summer days, hot and dusty in the sunshine in the open areas and then quickly cooler as we motored into thicker forest, the trail shaded by the canopy of trees.

Thereâ€™s a new bridge over the Manitou River and another over a smaller stream, places where, before the bridges were built, ATVs and other vehicles were driving through the water, muddying the designated trout streams and causing erosion.

ATVing on new North Shore trail. Steve Kuchera / Duluth News Tribune

Along one stretch of conifer lowland, a wooden boardwalk was built to keep the machines out of sensitive wetlands. In other wet areas where the ATV trail follows a snowmobile trail, gravel and culverts have been added to keep the summer machines from causing erosion.

â€œItâ€™s getting expensive to build trail like this,â€™â€™ said Kevin Johnson, DNR parks and trails supervisor for the North Shore area. â€œBut if you donâ€™t do it the right way from the start, itâ€™s not going to work for anyone.â€

Johnson said developing proper trails is worth the cost and effort. Not only does it provide safer, more scenic and fun places to ride â€” separating ATV use from general vehicle traffic in most areas â€” but designated, well-designed trails help reduce ATV-caused environmental damage.

â€œFor years weâ€™ve done nothing and it (ATV use) just spread out more and more, uncontrolled,â€™â€™ Johnson said. â€œBy providing a good trail system, weâ€™re managing the use.â€

Kevin Johnson (right), DNR Parks and Trails area supervisor, talks with Tom Cooper (from left) and Carol and Dave Soular before starting a 50-mile ride near Finland recently. (Steve Kuchera / skuchera@duluthnews.com)

Johnson said one of the best ways to keep ATV enthusiasts on designated trails is to design and build them to be interesting. Thatâ€™s why this new spur outside Finland â€” Prospector 12 â€” has so many twists and turns, dips and climbs. In places we could only go about 5 mph, while on road stretches we motored up to 35 mph.

â€œYou want to give them some decent seat time. If you build straight trails, like a road, they zoom through and get to the other end too fast. You want turns and scenery and some rocks and some difficulty involved,â€™â€™ he said while navigating a particularly curvy trail segment in his DNR-issued Kawasaki Mule side-by-side. â€œNot dangerous-difficultâ€¦ but the more seat time, the better.â€

The Prospector ATV Club has about 150 members, many also members of local ATV and snowmobile clubs in their home community. The full, 250-mile Prospector system could be completed within two or three years, Potter said, and will connect the Finland and North Shore trail systems with Babbitt, Embarrass, Ely and Tower-Soudan, including Bearhead Lake and Lake Vermilion state parks.

â€œThe long-term goal has been to connect the North Shore communities to the Range communitiesâ€™â€™ by ATV trail, said Rick Goutermont of Silver Bay, an avid ATV rider and a Lake County Commissioner. â€œThatâ€™s going to be huge for us.â€

Itâ€™s the local club members who will maintain the trail, checking and filling eroded areas, repairing and replacing signs, cutting trees, removing loose rocks, replacing culverts, removing problem beavers and leveling ruts.

â€œEveryone thinks that once a trail is built, the work is over. But I remind them that's when the work really starts,â€™â€™ said Dave Soular of Babbitt, who joined us on our ride. He should know. Heâ€™s been maintaining the Babbitt ATV clubâ€™s 60 miles of Stony Spur trail for more than a decade.

â€œMaintenance is a big issue. Especially with the big new machines. They have so much power they can really tear up a trail if people arenâ€™t careful,â€™â€™ Soular said.

An oncoming UTV driver holds up a clenched fist, signaling that he is the last vehicle in a group. (Steve Kuchera / skuchera@duluthnews.com)

In our group of five ATVs, only one was a traditional single-person four-wheeler. The others were larger, side-by-side units, by far the fastest growing segment of the ATV market.

The Prospector system, on the drawing board since 2013, currently is undergoing a \$2 million construction spree, with money coming from state bonding dollars, the Department of Iron Range Resources and Rehabilitation, the state ATV fund (stocked with license and gas tax dollars) and grants from Polaris and Yamaha â€” two of the largest ATV manufacturers.

The Finland area already was connected to Silver Bay to the south by the Moose Walk and Moose Run ATV trails. The new Prospector system will push west and north to expand ATV opportunities.

A new sign marks a section of the Prospector's ATV Trail System that opened in mid June. (Steve Kuchera / skuchera@duluthnews.com)

Farther north and west, the Voyageur Country trail system includes Crane Lake and communities south of Voyageurs National Park, with trails connecting to Ely, Orr and Lake Vermilion. Organized in April 2015 with 66 members, the Voyageur Country ATV club now has more than 700 members and has worked to open U.S. Forest Service Roads and St Louis County roads to connect hundreds of miles of existing wooded trails.

On the Iron Range, the Quad City system connects many trails and communities. The Northern Traxx system includes trails in the Chisholm and Side Lake areas and currently is planning a new trail connecting Chisholm and Hibbing that is now under DNR review and open for public comment.

Eventually, even Duluth, Grand Marais, International Falls and Grand Rapids will be connected by a continuous system â€” more than 1,500 miles of trail.

â€œWeâ€™re going to have a world-class trail system, the kind of place where riders can come and spend a week and never ride the same trail twice,â€ Potter said.

The developing ATV trails network isnâ€™t just for local motorheads. ATV-focused vacations have become a big deal. (On a recent drive down Highway 61 from Silver Bay to Duluth we counted 20 vehicles pulling ATVs heading north before we saw a single trailered boat.)

â€œI know guys who are throwing their tent into the back and riding off on their ATVs for camping trips with the family,â€™â€™ Goutermont said. â€œThatâ€™s the next big thing in ATVing.â€

Leroy Teschendorf, who until last month owned the Wildhurst Lodge outside Finland that for years has catered to ATV-riding guests, said the area already had become a destination for ATV enthusiasts, not just from the Twin Cities but from as far away as New York, Pennsylvania, Iowa, Illinois and beyond.

â€œSure, they have trails at home. But they are straight and flat â€! They just donâ€™t have the scenery or the wildlife we do here,â€™â€™ said Teschendorf, vice president of the Finland Area ATV and Snowmobile Club. â€œPeople out for a ride come back after seeing a bear or a moose or deer and they are just ecstatic. They keep coming back here to ride.â€

A hen grouse and two chicks cross an ATV trail near Finland recently. (Steve Kuchera / skuchera@duluthnews.com)

The entire northern Minnesota ATV system is a maze of local trails, connecting corridors and scenic loops that supporters hope someday rivals the stateâ€™s snowmobile trail system developed decades ago.

â€œWe used to say people wanted to go 20 or 30 miles in a day, so thatâ€™s what we were aiming forâ€™â€™ for trails, Potter noted. â€œBut now, the machines are so much better, we have guys going 100 miles in a day, easy.â€

Most northern counties have enacted new ordinances in recent years allowing ATVs to ride on county roads. While that was controversial in some areas â€” and while ATV manufacturers urge no riding on roadways â€” the move enabled ATV riders to get from one trail to another without having to trailer their machine.

â€œNobody wants to ride on a road. But it allows us to access more trails. Itâ€™s been huge in connectivity, getting from one trailhead to another, and to access servicesâ€™â€™ like gas, food and lodging, Potter said, praising county officials for their cooperation.

â€œItâ€™s going to be hard to keep people away once they see what we have for trails and camping up here,â€™â€™ Teschendorf said. â€œI don't think any place can top these trails.â€

ATV registrations keep soaring

Minnesota started registering ATVs in 1984 with just 12,235 tallied. By 2001 that number topped 200,000 and by 2019 it more than doubled again to 455,611, including recreational and farm ATVs and larger off-highway vehicles. (Another 1,861 non-resident ATVers purchased temporary passes in 2019.) By comparison, state boat registrations peaked at 868,000 in 2008 and leveled off to around 815,000 by 2019. Minnesota snowmobile registrations peaked at 297,000 in 2001 and dropped to 195,782 by 2019.

FIGURE 1
SITE OVERVIEW FIGURE
PROSPECTOR TRAIL

Legend

- Yellow Star: Stream Crossing Intersections
- Red Star: PTH Crossings
- Red Line: MNRW Control Public Water Crossing
- Blue Line: Mine Boundary
- Blue Line: Mine Contaminated
- Yellow Line: Proprietary Trail segments
- Green Circle: MNRW Designated City Water Crossing
- Black Line: Old Trail
- Black Line: New Trail
- Black Line: Old Trail



Minnesota DNR News

For Immediate Release:
Nov. 10, 2020

Questions? Contact DNR Information Center
by [email](#) or call 888-646-6367.

In This Issue

- DNR to host virtual summit to discuss off-road vehicle opportunities
- Archers have record success rate at Camp Ripley hunts

DNR to host virtual summit to discuss off-road vehicle opportunities

Public also encouraged to complete online survey

The Minnesota Department of Natural Resources and the Minnesota Four Wheel Drive Association (Mn4WDA) invite the public to a virtual summit to discuss current and future off-road vehicle opportunities in the state to kick off a master planning process.



The virtual event will take place from 6-7:30 p.m. on Nov. 18. A recording of the summit will be available after the event.

The Minnesota Legislature appropriated funding in 2019 to complete a statewide master plan for ORV trails, touring routes and recreation areas. ORVs are defined as 4x4 vehicles

capable of off-road travel and include modified pick-up trucks, sports utility vehicles, and "rock crawlers."

The Minnesota ORV Master Plan will identify ways to enhance ORV opportunities and expand the associated social and economic benefits for local communities. Project elements include data collection on existing trail use and user experience, and engagement with ORV enthusiast associations and those involved in other forms of outdoor recreation. The plan will include a thorough analysis of social and environmental factors to ensure identified ORV enhancement opportunities are sustainable and reflective of Minnesota's multi-use approach to the outdoor recreation system.

Through an online survey and tool (WikiMap) that will launch Nov. 18, people will be able to share information about their vision for the state's ORV system. The survey will be open through Feb. 28.

Those wishing to attend the virtual summit or complete the survey may log on to www.MNORVmasterplan.org to do so. This website includes more information about the project, and will be updated periodically with new information about public engagement opportunities, surveys, and interactive maps.

Those wishing to attend the virtual summit and require special accommodations may contact [Joe Unger](#) at 651-259-5279.

Act. Any unencumbered balance does not cancel at the end of the first year and is available for the second year.

(i) \$250,000 the first year and \$250,000 the second year are for matching grants for local parks and outdoor recreation areas under Minnesota Statutes, section 85.019, subdivision 2.

(j) \$250,000 the first year and \$250,000 the second year are for matching grants for local trail connections under Minnesota Statutes, section 85.019, subdivision 4c.

(k) \$600,000 the first year is from the off-road vehicle account for off-road vehicle touring routes and trails. Of this amount:

(1) \$200,000 is for a contract with a project administrator to assist the commissioner in planning, designing, and providing a system of state touring routes and trails for off-road vehicles by identifying sustainable, legal routes suitable for licensed four-wheel drive vehicles and a system of recreational trails for registered off-road vehicles. Any portion of this appropriation not used for the project administrator is available for signage or promotion and implementation of the system. This is a onetime appropriation.

(2) \$200,000 is for a contract and related work to prepare a comprehensive, statewide, strategic master plan for off-road vehicle touring routes and trails. This is a onetime appropriation and is available until June 30, 2022. Any portion of this appropriation not used for the master plan is returned to the off-road vehicle account. At a minimum, the plan must: identify opportunities to develop or enhance new, high-quality, comprehensive touring routes and trails for off-road vehicles in a system that serves regional and tourist destinations; enhance connectivity with touring routes and trails for off-road vehicles; provide opportunities for promoting economic development in greater Minnesota; help people connect with the outdoors in a safe and environmentally sustainable manner; create new and support existing opportunities for social, economic, and cultural benefits and meaningful and mutually beneficial relationships for users of off-road vehicles and the communities that host trails for off-road vehicles; and promote cooperation with local,

state, tribal, and federal governments; organizations; and other interested partners.

(3) \$200,000 is to share the cost by reimbursing federal, tribal, state, county, and township entities for additional needs on roads under their jurisdiction when the needs are a result of increased use by off-road vehicles and are attributable to a border-to-border touring route established by the commissioner. This paragraph applies to roads that are operated by a public road authority as defined in Minnesota Statutes, section 160.02, subdivision 25. This is a onetime appropriation and is available until June 30, 2023. To be eligible for reimbursement under this paragraph, the claimant must demonstrate that: the needs result from additional traffic generated by the border-to-border touring route; and increased use attributable to a border-to-border touring route has caused at least a 50 percent increase in maintenance costs for roads under the claimant's jurisdiction, based on a ten-year maintenance average. The commissioner may accept an alternative to the ten-year maintenance average if a jurisdiction does not have sufficient maintenance records. The commissioner has discretion to accept an alternative based on a good-faith effort by the jurisdiction. Any alternative should include baseline maintenance costs for at least two years before the year the route begins operating. The ten-year maintenance average or any alternative must be calculated from the years immediately preceding the year the route begins operating. Before reimbursing a claim under this paragraph, the commissioner must consider whether the claim is consistent with claims made by other entities that administer roads on the touring route, in terms of the amount requested for reimbursement and the frequency of claims made.

(1) \$600,000 the first year is from the all-terrain vehicle account in the natural resources fund for grants to St. Louis County. Of this amount, \$100,000 is for a grant to St. Louis County for an environmental assessment worksheet for the overall construction of the Voyageur Country ATV Trail system and connections, and \$500,000 is for a grant to St. Louis County to design, plan, permit, acquire right-of-way for, and construct Voyageur Country ATV Trail from Buyck to Holmes Logging Road and to Shuster Road toward Cook. This is a onetime appropriation.



DNR RESPONSE TO COVID-19: For details on adjustments to DNR services, visit this webpage (<https://www.dnr.state.mn.us/covid-19.html>). For information on the state's response, visit the Department of Health website (<https://www.health.state.mn.us/diseases/coronavirus/index.html>) .

DNR and partners begin process to provide better off-highway motorcycle experiences

August 27, 2020

The Minnesota Department of Natural Resources, in conjunction with the consulting firm Up! Outside and District 23/Amateur Riders Motorcycle Association (ARMCA), is creating a master plan for off-highway motorcycle (OHM) use across Minnesota.

The master plan will gauge current use and trends, the desires of riders, the views of non-riders, and current and proposed opportunities. When completed, the plan will be used as a strategic tool to guide the department's future management of off-highway motorcycle experiences.

OHMs are used in Minnesota for a variety of recreational activities. The most common are dirt bikes or trail bikes. They are used on motocross tracks on private property, and for flat track racing, off-road racing and noncompetition trail riding. There are also specialty OHMs called trials bikes, which are used for similar activities as BMX bicycles. Other OHMs can include dual-sport motorcycles which are highway licensed and capable of traveling both on and off paved roads.

The DNR and ARMCA work together to manage OHM trails on state lands and within the grant-in-aid program. The master plan will focus on recreational trail use, but additional types of OHM use will also be reviewed. The final plan will assist the DNR and its partners to manage trail use and development strategically. This will include trail maintenance, environmental protection, and users' interests in higher levels of difficulty on current or proposed trails, skills building areas, and training areas.

UP! Outside will use surveys and conference calls as initial scoping and information gathering tools. When that information is analyzed, the team will use public meetings, surveys, or web conferencing to gather public input.

More information can be found on the [project website](http://upoutside.com/projects/minnesota/ohmmasterplan.aspx) (<http://upoutside.com/projects/minnesota/ohmmasterplan.aspx>) .

DDC 5E -230L-

Questions?

Call 651-296-6157 or 888-MINNDNR (646-6367)

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Doc 6

-231-

Scanned letter dated March 06, 2017 letter Thomas Kerr, US Fish and Wildlife Supervisor, MN, IA



United States Department of the Interior

FISH AND WILDLIFE SERVICE
5600 American Boulevard West, Suite 990
Bloomington, Minnesota 55437-1458



Received

March 6, 2017

MAR 10 2017

Minnesota Department of Natural Resources
Ms. Mary Straka
Division of Parks and Trails
500 Lafayette Road
St. Paul, MN 55155-4040

DNR Parks and Trails
Central Office

Dear Ms. Straka:

The U.S. Fish and Wildlife Service (Service) has recently become aware of a proposal by the Minnesota Department of Natural Resources to develop a continuous off road vehicle route identified as the Border to Border Off-Road Vehicle Trail. We understand that the proposed trail will utilize existing national, state and county forest roads as well as other public trail and road systems across the northern third of the state and is intended to provide expanded recreational opportunities for individuals operating licensed four-wheel drive and off-road registered vehicles. It also appears that the proposal includes the designation of "loops" or other destination specific routes off the core trail that will access tourist destinations and locations of interest.

The Service administers several National Wildlife Refuges and numerous Waterfowl Production Areas within the state and many are located geographically within the preliminary project boundary. These lands are managed as part of the National Wildlife Refuge System and have been acquired to conserve wildlife, protect critical habitat, and support wildlife-dependent public recreation such as hunting, wildlife observation and photography.

While the Service is very supportive of opportunities to promote outdoor recreation, the potential for the proposed project to conflict with priority recreational uses on National Wildlife Refuge System lands appears plausible and may even detract from or negatively impact recreational opportunities for the visiting public. Careful planning and foresight will be imperative to avoid potential conflicts.

The Service recognizes that the intent of the trail is for light trucks and jeep-type vehicles however, current state designation of off-road vehicles (ORV) is much broader and may include certain Utility Task Vehicles (UTV). While most public roads on or near Refuge System lands are open to licensed motor vehicle travel, designation of a trail has the potential to increase visitor conflicts by substantially increasing traffic and consolidating travelers into larger packs or caravans. In addition, the use of ATVs and UTVs on National Wildlife Refuges and Waterfowl Production Areas is prohibited.

We appreciate the opportunity to provide comment and suggestion to inform the planning aspects of this project and enhance the enjoyment of all visitors to National Wildlife Refuge System lands in

Minnesota. We would appreciate opportunities to provide additional comment and suggestions as future drafts become available. If you have specific questions regarding this letter or Refuge System lands within the project corridor, please do not hesitate to contact Mr. Neil Powers, Project Leader, Tamarac National Wildlife Refuge at 218/844-1752. Thanks in advance for your cooperation.

Sincerely,

Thomas Kerr
Refuge Supervisor, MN, IA

Doc 6A - 231A-

STUDIES / DOCUMENTS ON ATV IMPACTS ON THE ENVIRONMENT AND WILDLIFE

Cumulative and Universal : ATV IMPACTS ON LANDSCAPE AND WILDLIFE, 2011

https://www.lsohc.leg.mn/materials/16_Mtg/DEC_14_2016_ORV_WHITE_PAPER_BacakcountryHuntersAnglersofAmerica.pdf

Environmental Effects of Off Highway Vehicles on Bureau of Land Management Lands 2006 US Dept. of Interior , Us Geological Survey

<https://pubs.usgs.gov/of/2007/1353/report.pdf>

Adirondack Council Preserving Water air and Wildlands, 2017
Why ATVs and Wildlife do not mix

<https://www.adirondackcouncil.org/page/blog-139/news/why-all-terrain-vehicles-and-wildlife-do-not-mix-965.html>

Effects of all terrain vehicles on forestlands and grasslands, US Department of Agriculture, 2008

<https://www.fs.fed.us/t-d/pubs/pdf/ATV/08231811L.pdf>



Doc 7 -232-

*see page 2
for reference*

Division of Parks and Trails
1601 Minnesota Drive
Brainerd, MN 56601

March 13, 2018

page 1 of 3

Jean Chadwick, President
Clearwater Lake Area Association

Dear Ms. Chadwick,

I am responding to your letter to ensure you and all of the people you copied receive the same information. The same information that is posted on the DNR's web site is the proposal to date. The maps of the roads proposed to be used in the draft alignment for the touring route are the details of the proposal so far. Planning is currently underway to define a final alignment for the route. Listening sessions are being held across the state.

Session law of 2015 directs the Department of Natural Resources (DNR) to work in conjunction with Minnesota Four-Wheel Drive Association (MN4WDA) to address off-road vehicle touring routes and other issues related to off-road vehicle activities. Session law is a mandate or directive. The Minnesota Four-Wheel Drive Association (MN4WDA) in conjunction with the DNR started planning for a border to border touring route. The DNR contracted with the National Off-highway Vehicle Conservation Association to assist with planning.

Counties and townships do receive state funds and these roads are already open to any highway-licensed vehicle, but we recognize additional volume will be generated. MN4WDA is sponsoring legislation for an appropriation out of the ORV account that local road authorities can access.

In talking with the Rustic Roads Program Coordinator of the Wisconsin DOT Bureau of Planning & Economic Development, she notes the WI Rustic roads program has been in place for 40 years. They have brown and yellow Rustic Road signs demarcating over 700 miles of scattered rustic roads to assure travelers that they are on the route. The signs are furnished by WI DOT. The Wisconsin Department of Tourism promotes travel to these roads as well. Over the years, Wisconsin Public Television, Midwest Weekends website, The Wisconsin State Journal, various community websites, published books and other groups have featured the WI rustic roads program. The Wisconsin Rustic Roads Coordinator noted the roads do not receive any additional maintenance, enforcement, litter or garbage pickup from the state. No environmental damage or additional spread of invasive species attributed to being a rustic road has occurred.

This proposal is not adding a new use, highway licensed vehicles are already legally using the all of the 2018 proposed route. The final touring route alignment keeps all current seasonal road closures or weight limit restrictions and will not displace existing uses. The touring route is proposed to be promoted to visitors from the time seasonal road restrictions are lifted in the spring to November 1st annually. Some of the proposed roads on the east side of the state are groomed for snowmobiles in the winter.

There are groups that may submit new trail projects off this core road touring route or in other places in Minnesota in the future. You reference this as phase II. Grants-in-aid (GIA) riding areas or trail proposals may include new construction. All new GIA proposals with construction will go through appropriate environmental review and permitting with mandatory best management practices for construction including appropriate storm water management plans to control potential sediment runoff during and after construction and control of terrestrial invasive species. The DNR has a rigorous proposal review process for new loops or areas and all proposals are evaluated to ensure sensitive natural areas are avoided, wetlands are not impacted and all statutes and rules are applied as required. The DNR is the Responsible Government Unit (RGU) for GIA.

The planning for the touring route has evolved from the listening sessions in 2017. I stated during the listening sessions held in 2017 that many touring route drivers were looking for a scenic adventure "trail" of rugged, unpaved, low-maintenance roads, with obstacles like roots, trees, rocks, and travel at slower speeds. In 2018, based on input from the public, road authorities as well as county, state and federal natural resource staff, it is a touring route for highway licensed vehicles. In 2018, we are really talking about roads that are currently open to highway licensed vehicles and are not proposing to change that in any way with this touring route. Some of the sections proposed in the Superior National Forest area are across ledge rock or may have roots exposed and rocks that stick out. It will cross streams and rivers across Minnesota on the existing infrastructure of bridges and culverts. It will travel along wetlands and lakes on existing roads.

OHV is an umbrella term that includes ATVs, off-highway motorcycles (OHMs) and off-road vehicles (ORVs) that each have separate registration and operation requirements. OHMs and ORVs can be licensed through the DMV for road use if equipped with headlights, turn signals, mirrors, etc. and can be registered with the Mn DNR for trail use. MN law requires highway license vehicles meet minimum bumper heights, tire size, tire tread requirements, and sound requirements.

The draft alignment proposal on the maps right now came out of listening sessions held a year ago with the public and local field staff of the USFS and Mn DNR. All of the route will require an agreement or a permission from the road manager or road authority for the touring trail to be on that road section so the final dedicated route depends on the input from listening sessions and the agreement of the road manager/authority.

The visitors coming for the touring route will increase traffic and road usage and these people will need food/gas/camping/lodging as well as enjoy the opportunity to purchase unique items from the areas. The exact amount of increased people and vehicles on the touring route will require monitoring once the route is in place. An estimate may be a few thousand a year to start with on the more attractively marketed segments. Travelers will choose the locations that are more welcoming and that actively market the unique features along the touring route.

As a touring route for highway licensed vehicles, enforcement would stay in the hands of the existing jurisdictions that already enforce on these roads. Vehicle use on roads by visitors to an area will be monitored and volunteer groups are interested to adopt-a-touring route section for cleanup and stewardship.

No destruction of natural resources is anticipated since the touring route is on existing roads. Off road travel on private land without permission is trespass and violators should be prosecuted. Off road travel across county, state and federal forest lands by highway licensed vehicles is prohibited. Violation is a misdemeanor.

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Page 3 of 3

Once a touring route project alignment is developed, the DNR Ecological Water Resources Division Environmental Review staff will analyze the project proposal, request additional information required and make a determination on the appropriate environmental review needed to meet MEPA as the RGU. The outcome of the Ecological Water Resources Division Environmental Review professional staff's analysis will be posted on the planning website information at Border to Border.

Sincerely,

Mary

Mary Straka
OHV Program Consultant

Equal Opportunity Employer

The failure of water runoff to explain any of the variability in sediment yield, either by itself or as part of one or more cross-products, presumably indicates that sediment yield from existing trails is detachment-limited rather than transport-limited. This result may be due to the relatively small size of the sample plots and the low intensity of the storms that were applied, although similar results have been obtained in other erosion studies (e.g., Wischmeier and Smith, 1978). The addition of four new indicator variables and their cross-products to the multiple regression models to examine the relative impacts of the different trail uses confirmed this state of affairs in that: (1) no significant relationships were uncovered between water runoff and the indicator variables, and (2) ten independent variables and cross-products combined to explain 70% of the variability in sediment yield. This second result is impressive. Treating the cumulative contributions of the different variables to the final result as a rough guide to their contributions confirmed that soil texture (37%), slope (35%), and user treatment (35%) had the most impact. Water runoff (9%) was one of three variables that made smaller contributions.

The multiple comparisons test results further clarified the roles of the different treatments and in particular showed that horses and hikers (hooves and feet) make more sediment available than wheels (motorcycles and off-road bicycles) on prewetted trails and that horses make more sediment available on dry plots as well (Table 4). The failure to distinguish between the other treatments may have been due to three problems with the study design. Two of the shortcomings have to do with the concept of geomorphic thresholds and the third with mechanical removal of sediment from the sample plots.

Schumm (1977) noted that the behavior of geomorphic systems may differ greatly when different external and internal stresses are applied. The thresholds that define when changes are initiated vary across space and through time since the minimum energy that must be applied varies with the environment. Kuss (1986) applied this concept to recreational trails, noting that almost any rainstorm or level of use would impact new trails but that very large storms or very heavy use is needed to initiate change on existing trails. These thresholds will vary with the type and quantity of use as well as with climatic, soil, and topographic conditions. Two problems with the current study may have reduced our ability to distinguish between hiker, off-road bicycle, and motorcycle uses: (1) the limitations of the rainfall simulator, and/or

(2) the small number of treatments (i.e., 100 passes).

The most important limitation with the modified Meeuwig rainfall simulator is that it produces rainstorms of only one-third the intensity of natural rainstorm events. We experienced several natural rainstorm events in the field and observed greater quantities of water runoff flowing down the trail from these events compared to our rainfall simulator events. The impact of rainfall intensity on the relationships between pre-existing trail conditions (i.e., trail history) and threshold values is not obvious. However, the restrictions placed on the duration and intensity of rainstorms applied in this study decreased the likelihood that threshold values were attained, especially since the study focused exclusively on existing trail segments. The application of only 100 passes (for all four treatments) probably contributed to the failure to attain the appropriate thresholds for all but horse traffic. Lull (1959) suggested impact per unit area could help account for the relative impact of different trail uses. Horses produce the greatest impact per unit area and as a result, horses produced the greatest net change in this study. Other treatments may not have been applied enough times or in conjunction with large enough simulated rainstorms for statistically significant differences to show up between them.

The failure to measure the quantities of soil removed with feet and tires from the prewetted plots may have contributed to the lack of statistically significant differences between the measured sediment yields for the hiker, motorcycle, and bicycle plots as well. The mechanical removal of sediment in these ways was observed on most prewetted plots. Most of the moist soil was removed and a dry soil surface was exposed as the treatments were applied to some plots. The quantities of sediment removed in these ways may need to be combined with those that were measured in order to quantify the relationships between the independent variables and sediment yield more precisely.

The solutions to these last three potential problems would have required the expenditure of more time and effort at each plot. The experiments conducted for this study covered a larger number of sites than most previous studies and required two or three people in the field for approximately 30 days. The choice of a more elaborate rainfall simulator, the application of intense disturbance (i.e., more hiker, horse, motorcycle, and mountain bike passes), and/or the measurement of mechanical erosion from plots would require a larger fieldwork component and/or a study that examined fewer plots.

CONCLUSIONS

Trail use in the last ten years has seen a dramatic increase in off-road bicycles. In many cases off-road bicyclists use the same trails as hikers, horseback riders, and motorcyclists, so that this additional use compounds erosional concerns. The results of this study provide land managers with some new data summarizing the relative impacts of four different users on two existing trails in southwest Montana. In particular, the results indicate that:

(1) the natural processes occurring on the two trails used for this study are complicated and difficult to decipher; (2) sediment yield is detachment-limited rather than transport-limited (at least for low intensity storms in the types of environments examined in this study); (3) horses produced significantly larger quantities of sediment compared to hikers, off-road bicycles, and motorcycles; and (4) the greatest sediment yields occurred on wet trails.

<https://www.fs.usda.gov/treeseach/pubs/34119>

Description

Sediment is the greatest pollutant of forest streams. In the absence of wildfire, forest road networks are usually the main source of sediment in forest watersheds. An understanding of forest road erosion processes is important to aid in predicting sediment delivery from roads to streams. The flowpath followed by runoff is the key to understanding road erosion processes. On rutted roads, the flowpath follows ruts until a cross drain structure or change of grade is encountered, leading to considerable sediment delivery. Insloping roads to bare ditches can lead to ditch erosion, but if the ditch is graveled or vegetated, erosion is generally minimal. Outsloping a road minimizes the flow path length on the road, minimizing surface erosion, and runoff is dispersed along the hillside, minimizing delivery. If roads have low or no traffic, the road surface may become armored, reducing erosion rates by 70 to 80 percent. If there is no traffic, and a road becomes covered in vegetation, erosion may drop 99 percent, but the hydraulic conductivity of the road surface is only minimally affected. In many cases, forest buffers absorb road runoff, minimizing the delivery of road sediment to streams. Buffers are less effective in wetter climates in absorbing runoff and reducing sediment delivery. Cutslopes can erode, making sediment readily available to be transported from roads. Graveling reduces the likelihood of rut formation, generally leading to a significant decline in road erosion. Traffic, however, can reduce the effectiveness of gravel by pressing it into the subgrade, or breaking it down. Paving a road will reduce road surface erosion, but may increase erosion in road ditches and on the hillsides or channels in a buffer area. If water is delivered from road cross drains to a channel, the chances of delivering sediment increases, as does the chance of entraining additional sediment through channel erosion. Empirical (USLE and SEDMODL) and process-based (KINEROS and WEPP) models have been applied to road erosion. SEDMODL and WEPP have been specifically adopted to model road erosion, and to account for the important detachment and delivery processes. A version of WEPP is available online that is receiving widespread use in the USA and throughout the world. This tool can either analyze single segments of road between cross drains, or can analyze up to 200 segments in a single run. Areas needing to be improved in road erosion are modeling the armoring process within a storm, developing the probabilistic capabilities of WEPP for road applications, adding mass wasting to the WEPP technology and expanding the WEPP road soil database.

Publication Notes

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- We recommend that you also print this page and attach it to the printout of the article, to retain the full citation information.
- This article was written and prepared by U.S. Government employees on official time, and is therefore in the public domain.

Invasive Species Account

Brief Overview

- Governing statute: M.S. 84D.15
- Year established: 2007 (program established in 1991)
- Primary Division: Ecological and Water Resources

Sources and Uses of the Funds

A surcharge on watercraft licenses under M.S. 86B.415, subd. 7, and civil penalties for violations of the law related to prohibited invasive species under M.S. 84D.13 are deposited into the account. Receipts from an annual \$5 surcharge on nonresident fishing licenses under M.S. 97A.475, subd. 7 are transferred each year from the Game & Fish Fund to the Invasive Species Account. The watercraft surcharge accounts for 42 percent of total revenues while the non-resident fishing surcharge accounts for 35 percent.

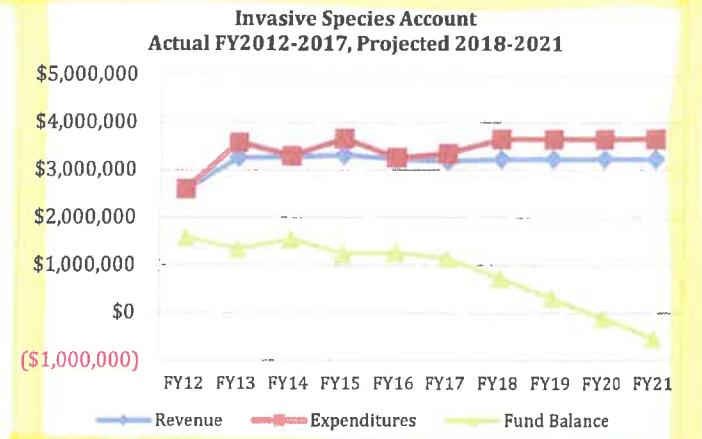
Funds from the Invasive Species Account are used for management of invasive species and implementation of Chapter 84D. Major activities include control of invasive species, watercraft inspection, public awareness, law enforcement, assessment and monitoring, management planning, and research.

FY17 Financial Summary

Beginning fund balance	\$1,258,993
Prior year adjustments	\$49,225
Revenues	
Watercraft Surcharge	\$1,325,445
Misc Receipts	7,490
Non Res Fishing Lic Surcharge, Water Rec Account	1,848,589
Total Revenues	\$3,181,524
Expenditures	
Ecological and Water Resources Mgmt	\$2,958,783
Enforcement	359,976
Conservations Corps Minnesota	25,000
Total Expenditures	\$3,343,759
Ending fund balance	\$1,145,983
Net change	(\$113,010)

Forecast

The fund balance has been declining for many years due to appropriations exceeding revenues. Each year DNR ensures a positive balance by reducing expenditures.



Expenditure projections are based on spending authorized in law for the current biennium and carried out through 2021. The department will manage levels of spending to ensure the account does not go negative as shown above

FY2017 Accomplishments

- Worked with other DNR partners to standardize and optimize field data collection, leading to field trials of iPads for data collection and the DNR AIS Survey Manual is being developed.
- Starry stonewort pilot project was developed to enable successful applicants to use multiple techniques to manage new or existing infestations and evaluate the active management.
- A series of four informal Aquatic Invasive Species (AIS) learning sessions (76 participants from 30 counties) and a series of five regional AIS prevention workshops (64 participants from 43 counties) brought together local government staff to actively share and learn from one another's collective experiences, initiate regional and statewide collaborative efforts, gain knowledge on AIS topics of concern, and build stronger inter-county relationships.
- Trained over 900 local government units on watercraft inspections.
- Tested, developed and implemented online lake service provider training.

Additional Resources

[Invasive species program](#)

[Aquatic invasive species grants and partnerships](#)

[Invasive Species of Aquatic Plants and Wild Animals in Minnesota, Annual Report 2010](#)

[Summary Report](#)

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QUETICO SUPERIOR Wilderness News

≡ MENU

See Pg. 2 for
reference



Small human-caused wildfire contained on Crooked Lake in Boundary Waters

June 8, 2020 by Greg Seitz



A firefighter tending to a prescribed fire on the Superior National Forest. (Photo courtesy US Forest Service)

Supporting
the Protection
of the
Minnesota-
Ontario
border region
and Superior
National
Forest
including the
Boundary
Waters Canoe
Area
Wilderness,
Quetico
Provincial
Park,
Voyageurs
National Park,
La Verendrye
Provincial
Park, Isle
Royale
National Park,
and Lake
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*bc 9A -237-***Reopen
s May
18**

Based on data so far, the strategy seems to be working. For the entire eastern part of the county, including Minnesota, the number of fires is average or a little higher this year. With more people enjoying outdoor recreation due to COVID precautions, the risk for human-caused fires is higher than normal.

Already, the number of acres burned is drastically lower than an average of the last 10 years. So far, across the whole region, nearly 25,000 acres have burned. **The average total by this date for the past 10 years is 54,000 acres.**

Park closures, border closures, and permit information updated as available. [More>](#)

TOP STORIES

Tips from the Forest Service for preventing human-caused wildfires:

- Don't dump sauna or wood stove ash with hot embers in the woods around your property.
- Never let children handle fireworks. Any use of fireworks near forested or un-mowed grass areas leads to a high potential for wildfire ignitions
- Never park a vehicle over tall, dry grass (vehicles cause more acreage burned than any other equipment).
- Install spark arrestors on outdoor equipment and recreational vehicles.
- Check for dragging chains before hauling campers or trailers. Dragging safety chains down the road can quickly create sparks, causing roadside grass fires.
- Burning trash is illegal, even in approved fire

Watch: Documentary traces long legacy of defending the Boundary Waters

Boundary Waters outfitters report high demand, take precautions to protect health

Doc 9A - 238 -

grates. Burning paper on windy days can easily blow out of the fire grate and quickly start a wildfire in nearby dry vegetation.

- “Shore Lunch” campfires, except in a campsite with an approved fire grate, are illegal and are likely to burn into the soil duff and escape as a wildfire after the camper has left the location. Ensure even legal fire grate camp fires are fully extinguished and cold to the touch before leaving the location unattended.

Scientists are trying to save Minnesota's northern forests from global warming

More information:

News Release: Superior National Forest and Partners Respond to Wildfires in Northeastern Minnesota

Several minor wildfires burn across canoe country

Small human-caused wildfire contained on Crooked Lake in Boundary Waters

Ten Years After the Ham Lake Fire: A Forest Regenerates

Busy weekend in the Boundary Waters could also be dangerous! y dry

- Boundary Waters
- ❖ crooked lake fire, fire, wildfire

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USDA Forest Service
Southern Region (R8)
1720 Peachtree Street, NW
Atlanta, GA 30309

Phone: (404) 347-4177
Fax : (404) 347-1781

[Contact Us](#)**Fire Prevention***Remember, Only YOU Can Prevent Wildfires***Fire Prevention**

Humans cause nearly nine out of ten wildfires. In 2015, nearly 59,000 human-caused wildfires burned more than two million acres. Most people think the phrase "human-caused wildfires" means arson, but people cause fires in lots of ways – unattended campfires, sparks from equipment or vehicles, backyard activities, cigarettes and children playing with matches.

Our good friend Smokey Bear offers some easy ways we can prevent wildfires.

CAMPFIRES—If you're heading outdoors, be safe with your campfire.

1. Pick the right spot
2. Prepare your campfire pit
3. Build your campfire responsibly
4. Maintain and extinguish your campfire

SPARKS FROM EQUIPMENT OR VEHICLES—Sparks from lawn mowers, power equipment and vehicles DO start wildfires. It pays to take these steps to prevent them.

1. Mow lawns, not weeds or dry grass. Metal lawnmower blades striking rocks can create sparks and start fires. Keep a shovel and fire extinguisher handy.
2. Install spark arresters on portable, gasoline-powered equipment. Get equipment checked regularly.
3. Be careful driving through or parking on dry grass or brush. Hot exhaust pipes can set grass on fire.

BACKYARD ACTIVITIES—A few simple precautions outside your home will help prevent wildfires.

1. Learn before you burn. Check local regulations and ordinances before you burn.
2. Burn this, not that. Burn vegetation, not household trash, plastic or tires.
3. Create a safe place. Avoid burning near power lines, overhanging limbs and other potential hazards.
4. Stay with your fire. Make sure it's completely out. Check the burn area for several days.
5. Surround your home with a fire-resistant zone.
6. Grill with care. Dispose of charcoal briquettes carefully. Make sure they are out cold.

Together, we can prevent wildfires and work toward a safe fire season in 2017.

For more information, visit www.smokeybear.com.

Biodiversity

Minnesota's transportation system directly impacts the state's wildlife and habitat resources. As the state experiences global trends like pollinator and species decline, it is important that transportation decision-makers consider ecosystem health. Understanding the challenges and opportunities associated with biodiversity could help protect native plants and animals and the habitat that supports them. Minnesota's 141,000 total road miles offer an opportunity to provide safety for people, as well as habitat for pollinators, nesting birds and other small wildlife.

Figure 1: Native Plants on a Roadside in Minnesota

Minnesota Wildlife

Minnesota is home to several endangered or threatened species, including the rusty-patched bumble bee, Topeka shiner, and northern long-eared bat. Of over 2,000 known native wildlife species, approximately 16 percent (346) are considered "Species in Greatest Conservation Need" because they are rare, declining, or face serious threats that may cause them to decline. This is up from 292 species in 2005. Habitat degradation is one of the leading stressors of "Species in Greatest Conservation Need".¹ Pollinators play a unique, key role in food and flower production. Bumble bees and monarch butterflies are two types of pollinators that are essential to Minnesota's environmental health. However, habitat loss and herbicide use have caused both bee and monarch populations to decline. Monarch populations, for example, have decreased 80 percent since the mid-1990s and that trend is expected to continue.² Changing practices and policy can help support pollinator populations.

Native Plantings Along Roadsides Provide Habitat

Native prairie land provides important habitat for pollinators and other species. Less than 2 percent of the original native prairie land in Minnesota still exists today. Roadsides provide a vast amount of land that can be used to reverse the loss of native prairie plants and pollinators. In addition to helping pollinators, native plantings help upland birds, songbirds, and provide places to filter water and reduce

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Quetico Superior Wilderness News

≡ MENU



Federal funds will support fight against invasive plants in northern Minnesota

July 24, 2020 by Greg Seitz

*see following
pages* →



*Supporting the
Protection of
the Minnesota-
Ontario border
region and
Superior
National Forest
including the
Boundary
Waters Canoe
Area
Wilderness,
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FOLLOW US

Invasive spotted knapweed in Lake County, Minnesota. (Photo by)

-241-
Doc 10



Organizations along Minnesota's North Shore of Lake Superior will receive thousands of dollars from the U.S. Forest Service to combat exotic plant infestations. The grants were included in 23 programs recently funded by the Great Lakes Restoration Initiative.

Categories

Select Category

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Invasive plants can have numerous deleterious effects on the ecosystem, including driving out native plants, increasing erosion, and otherwise disrupting the ecosystem.

"The Forest Service is proud to financially assist organizations aiming to promote watershed stability and biological diversity within the Great Lakes watershed," said Robert Lueckel, Acting Regional Forester for the Forest Service's Eastern Region. "By monitoring and reducing the spread of invasive plant species, CWMA grant recipients make the Great Lakes

SUBSCRIBE

SUPPORT OUR WORK

basin a better place for people, wildlife, and native plant communities."

Doc10

-242-

Help us preserve the wilderness character of canoe country for future generations.



A \$38,500 grant to the Cook County Invasive Team's project will support a seasonal technician who will lead outreach projects and coordinate the effort. A \$40,000 grant to the Lake County Soil and Water Conservation District's Lake County Invasives Team will support its goal of "healthy native plant ecosystems, less exposed soil, lower erosion risk, and improved watershed health."

All funds provided by the program must receive a 20 percent match from local partners, including staff and volunteer time and other investments.

The goal of the grant program is to "detect, prevent, eradicate, and/or control invasive plant species to promote resiliency, watershed stability, and biological diversity on Federal, State, or other public or private land."



TOP STORIES

The Superior National Forest says the region has not been hurt as much as other parts of the Midwest by invasive plants — yet. The agency stresses that preventative measures are much easier and more efficient than trying to get large infestations under control.



But several invasive plants have infested the region, and keeping them under control is key.

While invasive plants can spread on their own on the wind, water and other natural forces. But most long-

distance spread is caused by humans, who can transport seeds on clothing, equipment, vehicles, or pets. Residents of and visitors to northern Minnesota are encouraged to always ensure they are not unwittingly transporting these plants to new locations.



More information

-
-
-
-
-



■ Environment/Ecology/Nature, Invasive Species



QUETICO SUPERIOR WILDERNESS NEWS *Supporting the Protection of the Minnesota-Ontario border region and Superior National Forest including the Boundary Waters Canoe Area Wilderness, Quetico Provincial Park, Voyageurs National Park, La Verendrye Provincial Park, Isle Royale National Park, and Lake Superior. Published by the Quetico Superior Foundation Since 1964.*



Clean water is critical to our health, economy and overall way of life in the Land of 10,000 Lakes. We all play a role in protecting our state's most precious resource for future generations. Our state is home to 69,000 river and stream miles, 10.6 million acres of wetlands, and trillions of gallons of groundwater resources. Minnesotans care deeply about preserving these resources. We recognize that water is fundamental to Minnesota's present and future quality of life and prosperity. However, Minnesota's population is growing and our environment is changing. This puts stress on water resources. We can no longer take for granted easy access to high-quality water for recreation, drinking, and commerce.

Minnesotans chose to invest in water. In 2008, we voted to increase sales tax to safeguard drinking water sources as well as to protect, enhance, and restore lakes, rivers, streams, and groundwater. In 2015, Minnesotans took another step toward improving water by enacting a law that protects water quality and habitat by requiring vegetation buffers on more than 100,000 acres of land next to water. Recognizing the need for a water ethic, Governor Mark Dayton declared 2016 the Year of Water, and asked Minnesotans to take a pledge to protect and preserve clean water for drinking, recreation, agriculture and for the thousands of other ways water serves a role in our daily life. Take the Water Pledge: www.mn.gov/governor/issues/wateraction

Ensuring that all Minnesotans benefit equally from our water resources and that no group is disproportionately impacted by water pollution or supply problems will lead to a stronger, healthier state for everyone. Going forward, population growth, activities on the land, and economic growth will continue to affect water quality and quantity. Balancing the needs of the state's many water users while protecting our diverse water resources is a challenge that requires a coordinated, interdisciplinary, and ongoing effort.

Minnesota has abundant water resources overall, but quality and availability issues threaten our future. Water concerns touch on human health, ecosystems, and our responsibility to downstream neighbors.



CAMBRIDGE, MN



TWIN CITIES METRO



KOOCHICHING COUNTY, MN



INFRASTRUCTURE

The U.S. Environmental Protection Agency estimates that meeting Minnesota drinking water infrastructure needs will cost as much as \$7.4 billion over the next 20 years. Upgrading aging municipal wastewater treatment systems statewide is estimated at \$4 billion. Sixty percent of necessary upgrades are located in Greater Minnesota.

CHLORIDE

Chloride from winter deicing chemicals in runoff is an increasing concern for water quality, particularly because removal from water systems is prohibitively expensive. At high concentrations, chloride can harm fish and plant life. Some 349,000 tons of chloride in the form of winter deicing chemicals are applied in the Twin Cities metropolitan area each year.

WETLANDS

The biggest threats to wetlands are practices on the land that cause degradation of water quality and natural vegetation and the invasion by exotic species. The overall goal at both state and federal levels is to maintain or even increase wetland acreage. Wetlands' water quality also suffers from pollutants and water volume overloading due to storm water in both rural and developed areas.

CONTAMINANTS OF EMERGING CONCERN (CEC)

Individuals and industry use tens of thousands of chemicals in a vast array of products and applications, including household cleaners, medications, lawn care chemicals and personal care products. Some chemicals end up in places we never expected, including lakes and rivers. Many CECs have not been evaluated for the risks they pose to the environment, plants and animals, or humans.

Climate

The world is becoming warmer, and Minnesota's climate is changing significantly. Communities are already experiencing increasing temperatures and more frequent extreme rain events. The state as a whole is facing costly infrastructure damage, loss of winter tourism, as well as a cascade of effects on agriculture, natural resources, and wildlife. To help stabilize the climate, Minnesota needs to continue to reduce greenhouse gas emissions by using fewer fossil fuels and protecting the carbon stored in trees and soils. Action to mitigate climate change requires ongoing efforts at global, federal, state, community, and household levels.

Addressing climate change is a smart investment. It will lead to a safer and more environmentally stable future for Minnesota. However, the complex and global nature of climate change means that these important actions may not result in noticeable climate improvements here in Minnesota during the next several decades. Therefore, the state, its communities, and individuals also need to assess, plan for, and adapt to risks posed by our changing climate.

Minnesota is warming more quickly than either the U.S. or the global average rate.

**Minnesota's climate is changing:
We need to work to reduce greenhouse gas emissions and adapt to climate impacts.**

We need a
more resilient
Minnesota

WE HAVE TO ADAPT

The state needs to prepare for the risks of climate change by increasing our resilience so that when extreme events occur, communities and businesses recover more quickly.



COLOGNE, MN

INCREASE IN EXTREME WEATHER EVENTS

Minnesota is experiencing an increase in the frequency of extreme events. In particular, megarains are damaging infrastructure and causing severe flooding.



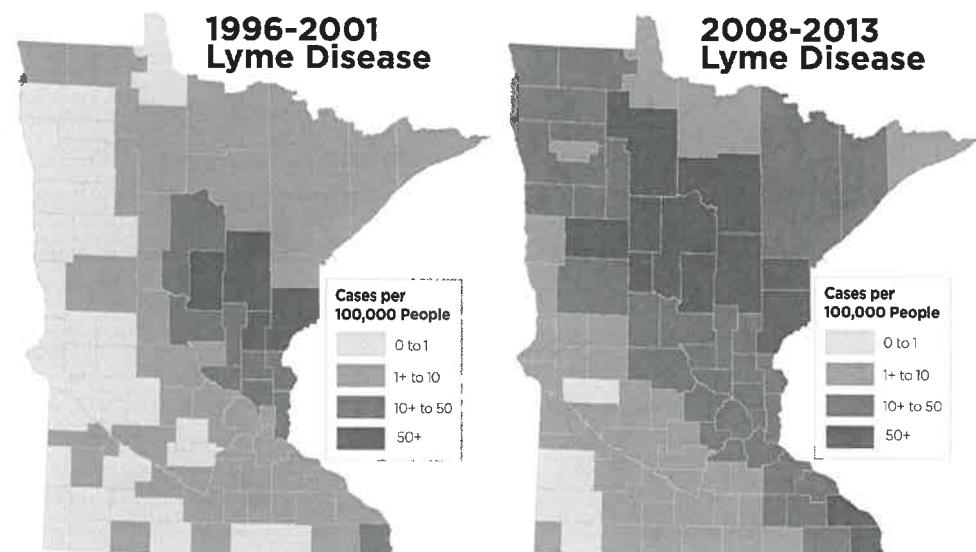
ELY, MN

LOST HERITAGE

Climate change impacts how we play. Warming winters are reducing the snowmobile, skiing, and ice fishing season by weeks. This, in turn, impacts our cultural heritage and how we share our Minnesota traditions with the next generation.

The range of Lyme disease is expanding as Minnesota warms:

A warming climate is one factor leading to an increased distribution of ticks in Minnesota and thus greater chance of exposure to tick-borne diseases.



SOURCE: Minnesota Department of Health

Doc 10C -243C -

Climate change

January 2019

Greenhouse gas emissions in Minnesota: 1990-2016

Biennial report to the Legislature tracking the state's contribution to emissions contributing to climate change.

text
next
page
→



Pollution Control Agency
Department of Commerce





Transportation

Emissions in the transportation sector include on-road vehicles, airplanes and other aviation equipment, trains, leaky vehicle air conditioning units, and natural gas transmission pipelines. More than 70% of emissions from the transportation sector come from light-duty trucks, passenger vehicles, and medium to heavy-duty trucks. GHG emissions from transportation have decreased by 8% since 2005, and account for about one quarter of the GHG emissions in Minnesota. In 2016, emissions from transportation and electricity generation were about the same². Since emissions from electricity that is generated in Minnesota have been reduced over time and are expected to decrease further, transportation is now the largest source of GHG emissions generated within the borders of Minnesota.

The trend towards larger vehicles and more miles traveled is preventing more significant emissions reductions in the transportation sector.

This sector will require ongoing, focused effort to reduce emissions to the levels necessary to meet our goals.

Our personal choices have an impact on emissions. On-road vehicles are the largest category of greenhouse gas emissions within the transportation sector. Federal regulations have resulted in newer vehicle models that are generally more fuel-efficient and therefore produce fewer GHG emissions than older, similar vehicles. However, at the same time Minnesotans are choosing to drive larger, less-efficient and more-polluting vehicles instead of smaller, more-efficient cars. Minnesotans are also driving more miles in those larger vehicles. While federal fuel efficiency standards are putting downward pressure on vehicle GHG emissions, the trend towards larger vehicles and more miles traveled is preventing more significant emissions reductions in this sector. The increased emissions from driving larger vehicles more miles offset reductions otherwise achieved by newer, fuel-efficient vehicles.

The state can support greater GHG reductions from transportation while ensuring that Minnesotans have access to varied transportation options. State government is doing its part by using hybrid or fully electric vehicles and supporting community actions to use alternative transportation. Read more in the "Moving forward" section about what we are doing to help meet the NGEA goals.



Electricity generation

In 2016, GHG emissions from electricity generation were about 29% lower than in 2005.

GHG emissions from electricity generation are mostly the result of fuel combustion used to generate electricity consumed by Minnesotans, including electricity generated outside of Minnesota. Other sources include methane from coal storage and hydroelectric reservoirs, CO₂ from flue-gas desulfurization, and SF₆ from electricity transmission and distribution.

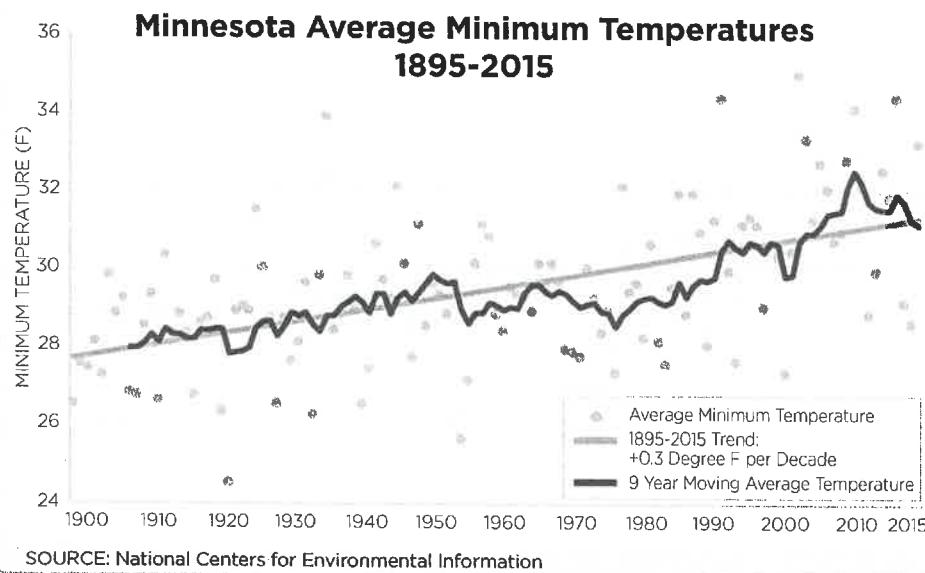
Historically, the electricity sector has been the largest source of GHG emissions in Minnesota; in 2016, however, emissions from electricity generation and transportation were about the same². Emissions from the electricity sector have declined 29% since 2005. The decrease is largely due to reductions in the amount of coal burned to generate electricity and increased use of renewable energy.

² Comparisons between sectors depend on the categories and boundaries chosen and on the methods used to estimate emissions. See the appendix for further discussion of methods.

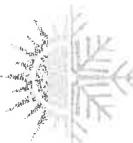
Temperature



Minnesota's climate is changing rapidly with increasing temperatures, especially in winter and at night, and with increasing frequency of extreme precipitation.

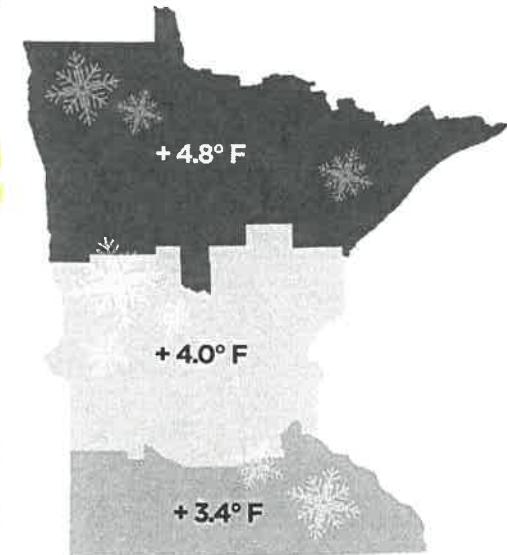


Minnesota is warming faster than both national and global averages, with much of that warming occurring when it's typically the coldest. Nighttime low temperatures in Minnesota have risen by 3° F since 1895, with the most warming taking place during the winter and in the northern parts of the state. Although some Minnesotans might view a warming during winter as a major improvement, the reality is that we have already begun to see detrimental impacts to our natural resources and to popular recreational activities such as ice fishing, skiing, and snowmobiling. Also, the warmer summer nights we've experienced have made it more difficult to keep cool. This is especially problematic in cities where the built environment creates "heat islands" that make it even warmer, and where hot nights disproportionately affect low-income individuals, the elderly, the very young, and those experiencing homelessness.



Since 1970, winter as a season has warmed 10 times faster than summer!

Since 1895, winter lows in northern Minnesota have increased 40% faster than in southern Minnesota.

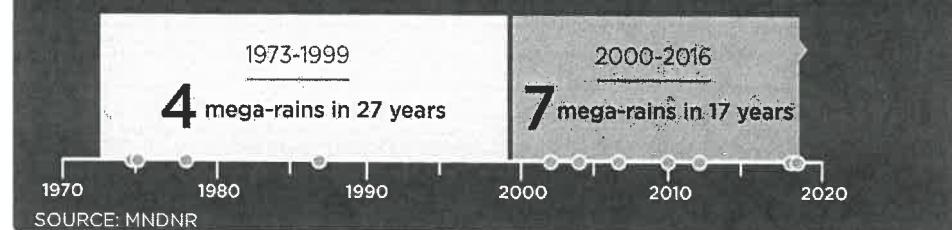


SOURCE: MNDNR



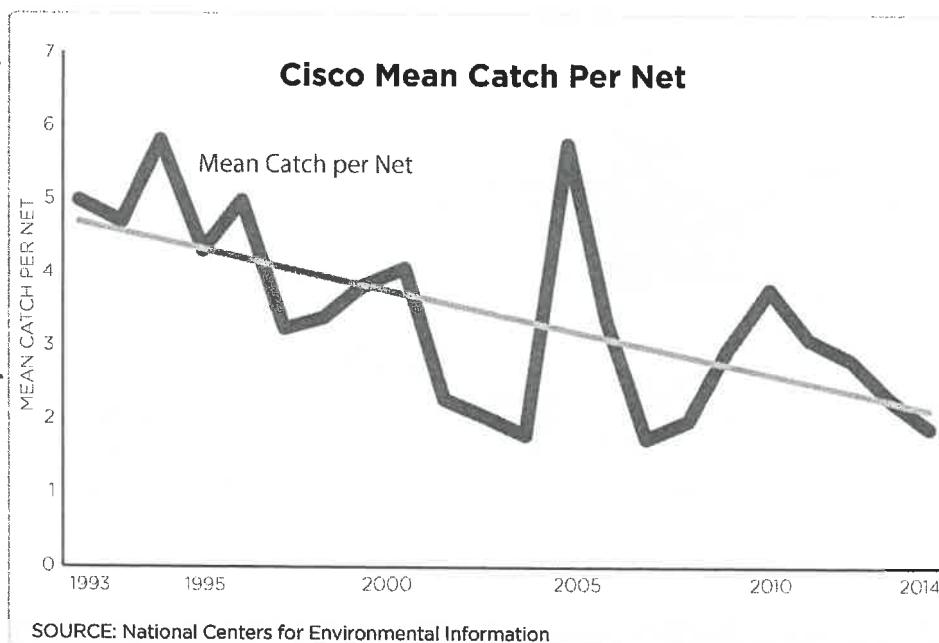
ZUMBRO RIVER, MN 2010

Timeline of Minnesota's historic mega-rain events 1973-2016



Climate Change and Wildlife

Cisco populations are declining with increasing temperatures, impacting walleye and trout that rely on them as a food source.



Climate has a strong influence on Minnesota's wildlife and native plant populations. Historical records show that temperature and precipitation patterns in Minnesota are changing. These changes have both direct and indirect impacts on fish, wildlife, and plants. For example, warming lakes directly impact cisco fish, which are sensitive to water temperatures and are experiencing population declines as a result. Cisco are an important food source for larger game fish, such as walleye. Climate-driven declines in cisco population indirectly impact walleye populations by reducing a key food source.

The stress of a changing climate on Minnesota's fish, wildlife and plants is further increased by continued introduction of invasive plants and animals that are not native to Minnesota, fragmentation of large habitat areas into smaller and less connected habitats, conversions of natural areas into developed lands and croplands, and pollution from our cities, roads, and croplands that runs off into our lakes, streams and rivers.

Do Your Part

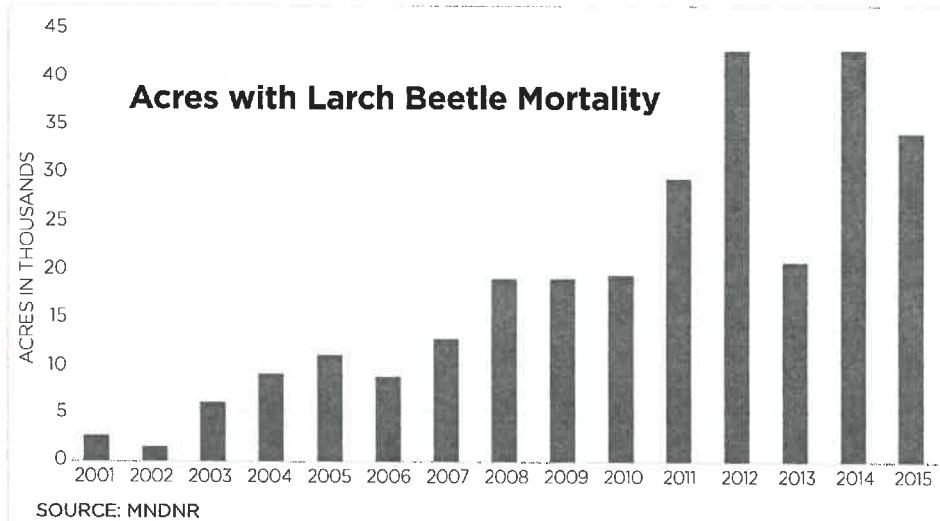
- Participate with local or national conservation groups to support landscape conservation and adaptation.
- Address what you can control
 - as you landscape your own yard or property be careful to avoid invasive species and try to minimize runoff.

Resource managers and landowners are increasingly managing for climate change. Simply working to keep the same landscape in place is no longer an option.

The eastern larch beetle is taking advantage of longer summers related to climate change to reproduce twice each year rather than just once. The increased beetle population is, in turn, killing larger numbers of tamarack trees. As the forest composition changes, there are further impacts on populations of forest wildlife.



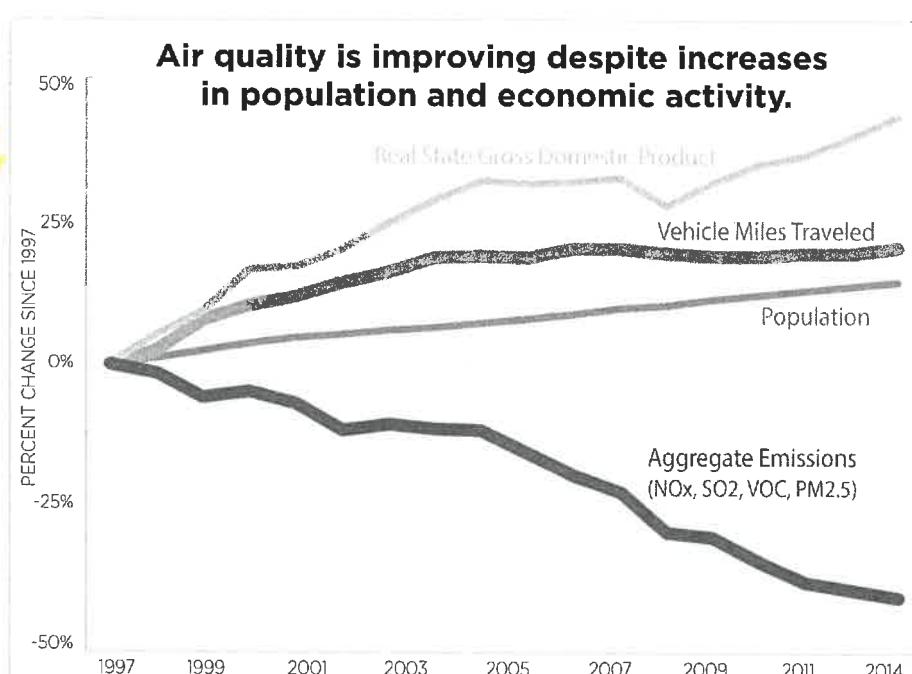
MARC ROBERTS, U.S. FOREST SERVICE



Today, much of the air pollution in Minnesota originates from smaller, more diffuse sources such as cars, trucks, tractor-trailers, small businesses, and residential wood burning. Individually, each of these sources may not produce much pollution, but together they become a major concern for public health. Addressing these sources will require new, innovative strategies that move beyond traditional regulatory programs. Through increased community outreach, voluntary programs, and partnerships, we must all work together to achieve future emissions reductions from these small, widespread sources.

Air pollution affects everyone, but some groups experience greater impacts than others, including the elderly, children with uncontrolled asthma, and people with pre-existing heart and lung conditions. In the Twin Cities, people living in poverty and in communities of color tend to have higher rates of pre-existing heart and lung conditions that can lead them to disproportionately feel the impacts of air pollution on their health. Continuing to reduce the level of these pollutants will not only improve public health and address health disparities but will also help our economy by avoiding air pollution-related health costs like medical expenses and productivity losses due to missed school or work days.

Air quality is improving despite increases in population and economic activity.



SOURCE: MPCA, 2016

Non-regulated sources make up the majority of emissions in Minnesota



ONROAD VEHICLES 30%

On-road vehicles include passenger cars and trucks, semi-trucks, and buses.



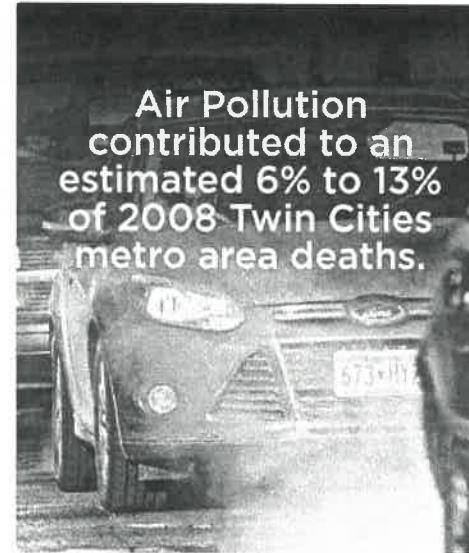
OFF-ROAD VEHICLES 20%

Off-road vehicles include those vehicles used in construction and agriculture, yard and garden equipment, recreational vehicles, trains, planes, and boats.



RESIDENTIAL AND COMMERCIAL 25%

Residential sources of air pollution include home heating, garbage burning, and wood burning for heat or recreation. Commercial sources of air pollution include gas stations, char-broilers, dry cleaners, and auto body shops.



Air Pollution contributed to an estimated 6% to 13% of 2008 Twin Cities metro area deaths.

Doc 10G -Z43H-

Mail body: email from Andrew re: USFS questions

From: Brown, Andrew (DNR) [<mailto:andrew.brown@state.mn.us>]
Sent: Monday, June 15, 2020 12:05 PM
To: Don Pietrick <pietricks@yahoo.com>; Creighton, Emily B -FS <emily.b.creighton@usda.gov>
Cc: Susan Perrin Schubert <susanpschubert@gmail.com>; Impson, Megan -FS <megan.impson@usda.gov>; Purman, Paul (DNR) <paul.purman@state.mn.us>
Subject: RE: Request for documents on road "infrastructure" on the Border to Border Route

Hi Don and Emily,

I participated in meetings and field visits on several occasions with USFS and DNR Area staff beginning in 2018. The biggest takeaway from all of that coordination is the uncertainty with the route being placed on those OML 2 roads that you reference. They are a remnant from the work of our NOHVCC contractor's effort to maximize the rustic experience of the route. A significant work product from the coordination meetings was a list of questions generated for DNR Parks and Trails regarding the use of these roads for the Border to Border Touring Route. These are the fundamental issues that need to be addressed by the route in a formal agreement before successful implementation could occur. Higher level roads have been identified as alternates in each case. Our coordination and agreement phase of this project are not yet finished with USFS. The outcome of current and future Environmental Review may alter consideration of the OML 2 routes. Attached is a summary of the questions posed by Superior National Forest in 2019 to DNR regarding use of those OML 2 roads.

Thanks,

Andrew Brown
NR Specialist SR./ Acquisition and Development Specialist

Minnesota Department of Natural Resources

Northeast Region Parks and Trails
1201 E. Hwy 2
Grand Rapids , MN 55744
Phone: 218-328-8985
Fax: 218-999-7915
Email: andrew.brown@state.mn.us

FS to DNR Border to Border Questions

- What road usage numbers are you using for your analysis?
 - we need monitoring and need to adjust maintenance as needed. Annual follow up and ongoing dialogue.
 - some routes are really low use and 5 cars a day increase could be a large impact.
- In your review are you considering endangered species, water quality, historic and heritage sites?
- How are you going to address noxious weeds on the route, specifically if rate of spread increases?
- What sections of the route currently need road maintenance needs to bring it up to your route standard. What are those needs (Brushing, Grading, Culverts)
- Sign Standards what is the proposed frequency of posting, what is the design and color of the signs, do the signs meet FS sign standards for roads. Are you going to have a website, brochures, maps? Who is responsible for posting and paying for the signs if they are damaged or removed?
- What road standard are you proposing to keep the route? Grading/Brushing Schedule? (over and beyond typical fs maintenance on that route) Is the DNR going to pay for additional road maintenance needs to keep the route at this road standard?

FS Agreement Potential Conditions:

- An annual commitment of funds to the FS or an agreement that they will allocate for another group \$X/year for OML2 road maintenance.
 - Annual brushing
 - Condition monitoring of lower standard roads
- How is DNR going to deal with storm event related issues?

- In a wind or heavy snow event how are they going to clear the roads of downfall?
- How are they going to deal with beaver plugged culverts and misc. beaver related issues such as dams flooding the road.
- How will they deal with heavy rain events or frozen culverts washing out sections of roads and/or culverts?
- Are there seasonal closures so we don't have folks beating them during spring break-up? Who will enforce this?
 - If formal closures are needed. We would have to get these closures on out MVUMS. Something like April 1 – June 1 closure would be good.
 - Currently the routes are open year round open to traffic as a general rule - use in spring currently not a problem but increased use popularity could increase road damage due to driving on soft roads.

DNR- Route would only promoted May- Fall

Biggest concern isn't the short term it is the full commitment for many years out, and who is taking care of the routes. Needs to be in the agreement.

Clear direction to the clubs about what we want done and how to implement the agreements. DNR area staff being pulled in to do work.

News*

Vote assures changes for Rubicon Trail

By Dana M. Nichols

Posted Apr 24, 2009 at 12:01 AM

RANCHO CORDOVA - Regional water pollution regulators Thursday ordered El Dorado County and the U.S. Forest Service to make big changes in coming years in how they operate the Rubicon Trail, possibly even closing the recreational Jeep road at times during wet weather or forcing users to pack out their excrement.

RANCHO CORDOVA - Regional water pollution regulators Thursday ordered El Dorado County and the U.S. Forest Service to make big changes in coming years in how they operate the Rubicon Trail, possibly even closing the recreational Jeep road at times during wet weather or forcing users to pack out their excrement.

The Rubicon Trail is the nation's most famous four-wheel-drive recreational trail, a boon to tourism in the region and a constant source of controversy because of the otherwise pristine mountain forests through which it passes. Hundreds of people - too many for the meeting room - turned out for Thursday's hearing at Central Valley Regional Water Quality Control Board headquarters in Rancho Cordova.

The unanimous vote by the seven-member Central Valley Regional Water Quality Control board does not tell the Forest Service and the county exactly how to prevent water pollution from use of the trail, but it does set deadlines in the next year or so for the two entities to come up with various plans for preventing contamination to mountain streams and lakes from the human feces, motor oil and eroded soil left behind by use of the popular trail.

Doc 12 -245-



Friends of the Rubicon (FOTR)

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ATV's	Bathrooms
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Closures	Directions
Directory	Donate
Ethics	Green Sticker
Help	History
Jamborees	Join Us
Jurisdiction	Law & Cops
Leadership	Maps
Master Plan	Meetings
Outlaws	Past Projects
Parking	Photo Galleries
Rig Mods	Rubi. Springs
Sanitation	Spider Lake
Time Cards	Trail Patrol
Trail Guides	When to Go
Who We Are	Workdays

RUBICON TRAIL: OIL SPILLS and FLUID CLEANUP TECHNIQUES

Carry the right gear with you to clean up any fluid discharges from your rig. Do not leave fluid messes, oil spills, or even oil shadows on rocks if you can at all help it. This will not only help keep our trail open, but it will also be much better for the long term health of the trail and its environment. It's the right thing to do.

Spill management is critical to sustainable OHV and trail system management. The Rubicon Trail (Friends of the Rubicon) started managing spills in 2001 and continues setting the example today. Because the Rubicon is a county (local government) road, El Dorado County has official spill policies and procedures that are perfect for any trail.

http://www.edcgov.us/Rubicon/Oil_Spil_Kits.aspx

Here is one spill kit (\$25) that is off-road related: <http://store.sdhqoffroad.com/off-roadoilspillkit.aspx>

Here is a video from an OHV group promoting home-made spill kits: <https://www.youtube.com/watch?v=oKlgjdYZD2o>

New Pig is a company that specializes in spill containment, from big to small, but their kits are kinda bulky: <https://www.youtube.com/watch?v=Yq7SckfEktc>

Here is some good info on toxic spills: <http://www.4x4training.com/Articles/EnvironmentalImpact/ToxicSpills.html>

And one more source of kits for 4x4/OHV: <http://www.bre-products.com/FourWheelKits.html>

Doc 12-246-

WE hope to have some small give-away type kits (grant funded), as well as a new product from Blue Devil -- Vehicle Spill Recovery Kits that we will be selling. We are suggesting you carry something like these to contain any vehicle fluid spills. It will help keep our busy trail healthy and open!

Some of my rock crawling competition friends told me about PIG (www.newpig.com) products. Sandee McCullen, AZ, gave me this report:

All of the P.I.G. products are oil absorbent..... some of the "tubes" are for large spills but the towels/pads hold a quart or more of oil AND do not absorb water. We used them for the Cal Rocs event in Phoenix in March 2003 where we had water running through the wash.

We had a roll over and the judges immediately "dammed" the water flow and threw an absorbent pad into the collected water. The pad was left there overnight, sitting in the oil/water puddle.

The BLM official picked it up the next morning and was amazed to find that ALL the oil was absorbed but that the pad was not also water soaked. It truly absorbed the oil from the water and dirt.

We also found if we rub the rocks with the pads right immediately after a spill, it absorbed the oil and we didn't end up with any "oil shadow."

For oil stains and/or residue from prior trips we scrub the rocks with a biodegradable cleaner and then spray with a microbial cleaner that will continue to work by "eating" the residue over time. We have been using Micro Blaze for several years now. The Arizona BLM are fully behind the use of this product and we have seen good results. Micro Blaze doesn't seem to work well, however, for the original heavy spill. You're better off with the PIG products or somethin else to get the heavy spill cleaned up.

Doc 12-247-

Baby diapers have been used by some folks to absorb fluid leaks. Kitty litter has worked for many folks. Old ice chests have been used to collect leaking fluid (by one tool-less doctor I know). One wheeler acquaintance of mine uses Simple Green and blue paper towels.

We are also going to be giving out oil spill kits as provided by El Dorado County Environmental Health, obtained through an OHV Trust Fund grant.

[More on El Dorado County Oil Spill Grant Program](#)

The point is that you **do** something to clean up any mess you leave behind. Just as you pick up your trash and properly dispose of your human waste, it's important that you also not leave behind fluid leakage on our trail. Thanks for your help and cooperation. Email me if you have any questions. Thanks, Del

[Visit Blue Devil products web site.](#)



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CLEARWATER COUNTY
RESOLUTION: 03132018
"BORDER TO BORDER (B2B) TRAIL"

A motion was made by Commissioner Newland, and seconded by Commissioner Nelson, and carried, to pass the following Clearwater County Resolution.

WHEREAS, The Clearwater County Board of Commissioners serve as the Road Authority for all County State Aid and County Aid Roads in Clearwater County and,

WHEREAS, The "mandate" from the Minnesota Legislature to develop "Border to Border Trail" as presented in publications and meetings, appear to be an overstatement of the actual language in the MN Statute which refers to an appropriation to "address off-road vehicle touring routes and other issues related to off-road vehicle activities" and,

WHEREAS, Phase One of the project focuses on Public Roads, Phase Two will add "challenge loops" that extend into environmentally sensitive areas that include challenging barriers for drivers and rough terrain subject to erosion, and the spread of invasive species, and

WHEREAS, Department of Natural Resources spokesperson Mary Straka, stated that they were looking for a scenic adventure "trail". She further emphasized the ideal route would be rugged, unpaved, low-maintenance roads, with obstacles like roots, trees, rocks, to encourage slower speeds, and

WHEREAS, Enforcing legal and responsible use of public roadways by Off Highway Vehicles may not be possible with the resources available to County Government. Self-policing is unlikely to be successful because of the nature of the Border to Border Trail activities, and

WHEREAS, The additional cost for road maintenance and repair would be significant for Clearwater County and while there is proposed provisions for repairs it seems doubtful that Clearwater County would be made whole.

NOW THEREFORE BE IT RESOLVED, That Clearwater County is opposed to the Border to Border Trail, because of the potential cost this trail could have on the Taxpayers of Clearwater County due to the, repairing of roads, cost of Public Safety, and

BE IT FURTHER RESOLVED, We respectfully request that the portion of the Border to Border Trail drafted for Clearwater County be abandoned or rerouted.

***** Certification *****

I hereby certify that the forgoing is a true and correct copy of a motion presented to and adopted by the Clearwater County Board of Commissioners at a duly authorized meeting thereof, on the 13th day of March 2018 as shown by the minutes in my possession.

Emily McDougall

Emily McDougall, Board Coordinator

- Monitor closed and restored routes to ensure they are effectively mitigating impacts to wildlife.
- Manage adaptively through closure, rerouting, or mitigation if monitoring identifies that wildlife conditions are no longer in compliance with planning and decision-making BMPs. ORV use in important wildlife habitats should only be allowed after peer-reviewed studies or data from wildlife and ORV monitoring conclude that wildlife populations will not be impaired.

Recreational Use Conflicts Research

Conflict is defined as an emotional state of annoyance with another group or person that can result in dissatisfaction with a specific experience (Yankoviak 2005). For example, a hiker seeking quiet in nature could experience conflict after encountering an ORV user on the same trail because the ORV use could be perceived as preventing the hiker from attaining his or her goal of a quiet, natural experience. Feelings of conflict often occur among quiet users when they hear motor vehicle noise, witness acts of great speed and/or reckless behavior, smell exhaust, and see visible environmental damage. This all leads to reduced opportunity and displacement of non-motorized recreationists from places they would normally frequent (Moore 1994, Stokowski and LaPointe 2000).

Both motorized and quiet recreationists prefer that trails be managed for multiple uses but with motorized and non-motorized activities separated (Andereck et al. 2001). Where trails are designated as multiple-use, heavy motorized use tends to cause other trail users to pursue opportunities at other locations in order to realize the desired experiences. There are numerous examples of non-motorized recreationists being displaced or leaving an area altogether where motorized use is common (e.g., Moore 1994, Stokowski and LaPointe 2000, Manning and Valliere 2002).

Best Management Practices for use conflicts

PLANNING AND DECISION-MAKING BMPs FOR USE CONFLICTS

- Designate motor-free Quiet Use Zones in both backcountry and front-country settings that emphasize wildlife needs and relatively low-impact recreational activities.

- Prioritize motorized route designations to protect public land resources and the safety of all public land users, and to minimize conflicts with other recreational uses and nearby residences.
- Ensure that ORV use does not preclude meeting the demand for hiking, equestrian and other non-motorized recreational uses.
- Do not locate ORV routes on trails, areas, or watersheds primarily used by hikers, horseback riders, mountain bikers, hunters, birdwatchers or other quiet recreationists and sportsmen, particularly those routes where unmanaged use has lead to motorized encroachment on non-motorized trails.

IMPLEMENTATION BMPs FOR USE CONFLICTS

- Undertake proactive and systematic outreach to motorized and non-motorized visitors in order to facilitate mutual understanding of the preferences and desired experiences of public land visitors.
- Establish trails or recreational working groups with both motorized and non-motorized stakeholders that meet regularly with land managers. These groups should work cooperatively to identify and resolve use conflict in a manner consistent with agency policy.
- Work with agency and local law enforcement to implement penalties and consequences for violating ORV regulations that will dissuade ORV users from such violations.
- Conduct surveys to establish the demand and opportunities for non-motorized recreation.
- Document use conflicts in a database that is shared with the public.
- Match ORV use to the available management and enforcement capacity (funding and staffing). This will assure that resources exist to guarantee adequate legal enforcement along all routes.

MONITORING BMPs FOR USE CONFLICTS

- Use monitoring to identify use conflicts on trails, areas, or watersheds traditionally used by hikers, horseback riders, mountain bikers, hunters or other quiet recreationists and sportsmen.



- Monitor closed and restored routes to ensure that motorized use is not occurring.
- Use monitoring data to limit or prohibit ORV access on routes where its use is leading to trespass onto other non-motorized trails, areas or watersheds.
- Require that motorized users have identification on vehicles equal in visibility to that found on highway vehicles.
- Monitor and enforce ORV noise violations by equipping law enforcement personnel with sound meters that can be easily calibrated and used in the field to test noise levels of ORVs at established trailheads and staging areas.

CONCLUSION

Scientific literature has firmly established ORV use as a significant perturbation to natural forest systems and ecology as well as creating conflicts among user groups. This underscores the need for widely adopted off-road vehicle Best Management Practices that are grounded in science. However, the effective implementation of these BMPs must be accompanied by adequate funding and staff levels in order to ensure that necessary monitoring and legal enforcement are carried out. With adequate funding and application of these BMPs, forest managers can designate routes that will provide for motorized recreation opportunities while managing ORVs with minimal harm to natural forests systems and the wildlife they support.

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Doc 14 -251- 1/3

This is part 1 From the Cook County Grand Marais Herald

B2B route running into opposition

By
ohtadmin | on
July 19, 2019
Brian Larsen

When asked about the proposed “Border to Border” route, David Hann, executive director of Minnesota Townships replied, “We’re not too enthused about this.”

Referred to as the B2B, Hann said the DNR never provided any information to his organization about the plans to use existing state, federal, county and township roads to make an 850-plus-mile trail for off-road vehicles.

See page
3 cont.

“It’s remarkable that no one from the DNR contacted the association at any time about any of this,” he said on Thursday, June 27.

The Minnesota Department of Natural Resources, Division of Parks and Trails, has partnered with the National Off-Highway

Vehicle Conservation Council (NOHVCC) and the Minnesota Four-Wheel Drive Association (MN4WDA) to develop a route from the border of North Dakota to the Tip of the Arrowhead.

Ending in Hovland, the B2B won’t be a true “Border-to-Border” route because the Grand Portage Band of Chippewa asked not to be included. They were concerned about high levels of traffic on their forest roads and how expanded road usage might impact tribal members exercising their rights to hunt, fish and gather for subsistence purposes.

On Tuesday, May 14 the Pennington County Board voted unanimously to oppose the Border-to-Border plan as it had been proposed.

When asked why, Pennington County Commissioner Don Jensen replied, “I talked to the townships in my district and they were opposed to the route because they did not want the upkeep and maintenance of both the road top or the signage that this would require over and above what they

Doc 14-252- 2/3

have now. The county roads get no money from the highway distribution fund, and therefore any extra maintenance cost is a burden on the property tax payers of the county.

“Furthermore the route they chose didn’t go through any towns in Pennington County so there was no tourism benefit.”

Jensen also noted that commissioners had asked Border-to-Border representatives to attend a Pennington County township association meeting and no one from that organization attended.

Cook County roads now penciled into the proposed course include six miles on the Arrowhead Trail, .5 miles on the Gunflint Trail, two miles on the Devil Track (County Road 8) Road, five miles on Cook County 27, 1.5 miles on Cook County 4 (Caribou Trail) and 3.8 miles on Cook County 2. Tallied together, that’s 18.8 miles of county roads, and many locals are worried that if these roads are damaged from increased use, the responsibility to fix them will lie with the county taxpayers.

When you add up the mileage in the Superior National Forest, which includes county, state, and U.S. Forest roads, it totals 270 miles with 164 miles run on U.S. Forest Service roads. Opponents of the B2B point out that the U.S. Forest Service doesn’t have much of a budget to improve its roads, and they fear that if there are a lot of B2B tours, the roads will be degraded with little hope of being repaired.

Bearing this fear out is an August 2015 Forest-Wide Road Study (travel analysis report) that cited a decrease in funding by 60 percent since the year 2000 for Superior National roads, without a similar shrinking of total mileage traveled on these back ways.

When decided, the approximately 850-mile route will link existing state and national forest roads—as well as township and county minimum-maintenance roads. This trail and its connecting spurs will be available for any highway-licensed vehicle to use.

This past spring the Minnesota legislature passed a one-time appropriation of \$200,000 for repair of county or township roads used by B2B trail riders. The funds are available until 2023 but there is a caveat.

For a county or township to be eligible for reimbursement, “the claimant must demonstrate that the needs resulted from additional traffic generated by the border-to-border touring route,” states the appropriations bill.

Plus, the increased use must be attributable to a border-to-border touring route that has caused at least a 50 percent increase in the maintenance cost for roads under the claimant's jurisdiction, based on a 10-year maintenance average.

The DNR commissioner can accept an alternative to the 10-year maintenance plan if a county or township does not have sufficient maintenance records, but "any alternative should include baseline maintenance costs for at least two years before the route begins operating."

As to the ability of townships to receive aid to repair roads damaged by vehicles used on the B2B route under the state's new legislation, Hann said the state didn't ask for input from the townships about a plan for reimbursement for repairs, "Which was ridiculous. Townships don't have the ability to track a baseline over many years, this is unworkable."

"For a township to try to keep track of off-road vehicle use on their roads is crazy. Who's going to pay for the maintenance and repair of those roads? The townships, that's who," he said, adding,

"One township just repaired five miles of road at a cost of \$35,000. How far will that \$200,000 go?"

The next step for the Minnesota Association of Townships, said Hann is, "to try to meet with the commissioner and see if we can slow this thing down or stop it all together."

Part 2 next week.

29.11 (3) \$200,000 is to share the cost by
29.12 reimbursing federal, tribal, state, county, and
29.13 township entities for additional needs on roads
29.14 under their jurisdiction when the needs are a
29.15 result of increased use by off-road vehicles
29.16 and are attributable to a border-to-border
29.17 touring route established by the commissioner.
29.18 This paragraph applies to roads that are
29.19 operated by a public road authority as defined
29.20 in Minnesota Statutes, section 160.02,
29.21 subdivision 25. This is a onetime appropriation
29.22 and is available until June 30, 2023. To be
29.23 eligible for reimbursement under this
29.24 paragraph, the claimant must demonstrate that:
29.25 the needs result from additional traffic
29.26 generated by the border-to-border touring
29.27 route; and increased use attributable to a
29.28 border-to-border touring route has caused at
29.29 least a 50 percent increase in maintenance
29.30 costs for roads under the claimant's
29.31 jurisdiction, based on a ten-year maintenance
29.32 average. The commissioner may accept an
29.33 alternative to the ten-year maintenance average
29.34 if a jurisdiction does not have sufficient
29.35 maintenance records. The commissioner has

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29.36 discretion to accept an alternative based on a

Article 1 Sec. 3. 29

05/22/19 REVISOR CKM/JU 19-5219

30.1 good-faith effort by the jurisdiction. Any

30.2 alternative should include baseline

30.3 maintenance costs for at least two years before

30.4 the year the route begins operating. The

30.5 ten-year maintenance average or any

30.6 alternative must be calculated from the years

30.7 immediately preceding the year the route

30.8 begins operating. Before reimbursing a claim

30.9 under this paragraph, the commissioner must

30.10 consider whether the claim is consistent with

30.11 claims made by other entities that administer

30.12 roads on the touring route, in terms of the

30.13 amount requested for reimbursement and the

30.14 frequency of claims made.



**Border to Border Touring Route
Project Summary**

See next page →

Project Administration:	Minnesota Department of Natural Resources (MnDNR), Parks and Trails Division
Proposer:	MnDNR and the Minnesota Four Wheel Drive Association (Mn4WDA)
Contractor:	National Off-Highway Vehicle Conservation Council (NOHVCC, 2017-2019)
Project Users:	High clearance highway licensed vehicles (HLV)
Partners:	Lake County, Itasca County, St. Louis County, Beltrami County, Lake of the Woods County, Marshall County, Kittson County, Pennington County, Minnesota Department of Transportation (MnDOT), MnDNR, US Forest Service (USFS, Chippewa and Superior National Forests), French Township, Mn4WDA and NOHVCC.
Touring Route Location:	Minnesota Counties: Lake, St. Louis, Itasca, Beltrami, Lake of the Woods, Marshall, Pennington and Kittson. See Appendix A for Township, Range and Section descriptions.

Development and maintenance

Maps and route signs will be provided by DNR as part of the touring route. Aside from the installation of signs, the DNR does not anticipate any new construction as a result of the touring route. Careful consideration during the planning phase identified existing roads with sufficient infrastructure that do not need any immediate improvements. Generally, county highways and state forest system roads receive a higher level of maintenance. Township roads and state forest minimum maintenance roads receive less maintenance. US Forest Service roads receive maintenance according to their development level. In 2019, the Minnesota Legislature appropriated \$200,000 from the ORV account to be used for maintenance along the route specifically related to maintenance needs stemming from the touring route use.

- Legislation passed in 2019 established a maintenance fund dedicated from the Off-Road Vehicle account. \$200,000 was appropriated.
- The purpose would be to allow local road authorities to apply for funds if they see significant increases in ongoing maintenance needs associated with the Border to Border Touring Route.
- This funding was in direct response to listening sessions where we heard that counties and townships were concerned about possible significant increased costs associated with maintenance needs.
- Given that the route is already open to highway-licensed vehicles, there may be no additional maintenance needs. If an issue develops this legislation will allow us to work together to ensure a successful route.

Enforcement

Minnesota vehicle laws will be enforced by county sheriff deputies and DNR conservation officers along the route. The DNR Division of Enforcement plans to provide additional conservation officer time along the route during the first year of operation and as needed after that.

Legislation

Original legislation: 89th Legislature, 2015, 1st Special Session, Chapter 4, Article 3 Environment and Natural Resources Appropriations, section 3 Natural Resources, subdivision 5

Maintenance fund: 91st Legislature, 2019, 1st Special Session, Chapter 4, Article 1 Environment and Natural Resources Appropriations, section 3 Natural Resources, subdivision 5

**Motorized Travel Management
Final Environmental Impact Statement
February 2010**

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DOC 15B

Volume 2: Appendix A – M

Lead Agency: USDA Forest Service
Cooperating Agencies: None
Responsible Official: J. Sharon Heywood, Forest Supervisor
Shasta-Trinity National Forest
3644 Avtech Parkway
Redding, CA 96002
(530)226-2500
For further information, contact: Tom Kisanuki
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see pages
2 + 3 + 4
(1-182 + 1-185)

Abstract: This Final Environmental Impact Statement (FEIS) describes the environmental effects of a proposal by the Shasta-Trinity National Forest to:

- (1) Prohibit cross-country motor vehicle travel off designated National Forest Transportation System (NFTS) roads, motorized trails, and areas by the public except as allowed by permit or other authorization (excluding snowmobile use).
- (2) Amend the Shasta-Trinity National Forest Land and Resource Management Plan (Forest Plan) with a non-significant amendment to be consistent with the Travel Management Rule (36 CFR Part 212, Subpart B) in prohibiting cross-country motor vehicle travel;
- (3) Add 44.20 miles of unauthorized routes to the current NFTS for public motor vehicle use. Approximately 36.51 miles of unauthorized routes would be added as roads classified open to all vehicles classes (highway-legal and nonhighway-legal), and approximately 7.69 miles of unauthorized routes would be added as motorized trails. Of the motorized trails proposed, about 0.85 miles would be open to “all trail class vehicles,” 1.44 miles would be classified as “motorcycle only” and 5.40 miles would be open to “vehicles 50 inches or less in width.” Seasonal restrictions would apply to approximately 0.15 miles of the proposed roads and trails.
- (4) Add areas open to motor vehicle travel below the high-water mark at Shasta Lake (28,403 acres) and Trinity Lake (15,644 acres) within the Whiskeytown-Shasta-Trinity National Recreation Area. These

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Ltr#	Comment	Response to Comment
94	Project contact information; and questions and answers	This is a screenshot of information regarding the travel management process, background, and contacts. Thank you for providing this in support of your comments.
94	Letter The Honorable Dianne Feinstein United States Senate One Post Street, Suite 2450 San Francisco, CA 94105	The letter from the Regional Forester provides explanation, as requested by Senator Feinstein on behalf of a constituent, of how the STNF decided to address motorized access to dispersed camping in this Travel Management decision. Attachment provides insight into the decision making process.
118	Letter to Randy Moore, Regional Forester 12/18/08	The attachment included a letter that offers concern for the route designation process on the Tahoe National Forest; concern that a science-based analysis will not be performed when implementing the TMR. Any action, including designating routes or re-designation of routes requires going through the NEPA process.
118	Statement of Abigail Kimbell before the House of Representatives Committee on Appropriations Interior, Environment, and Related Agencies Subcommittee Concerning The USFS Fiscal Year 2010 Budget 5/12/09	The attachment included a nationwide budgetary statement that does not pertain to implementing Subpart B of the TMR on the STNF.
118	Status and Summary Report OHV Responsible Riding Campaign Lisa Marie Frueh Monaghan & Associates November 15, 2001	Thank you for providing this information in support of your comments.
118	Monaghan and Associates, a marketing research firm, conducted a 2001 study at the behest of the Colorado Coalition for Responsible OHV Riding, a coalition of off-road vehicle representatives, environmentalists and public officials. See Status and Summary Report; OHV Responsible Riding Campaign, attached hereto. Researchers surveyed Colorado off-road vehicle riders through a series of three focus groups. Monaghan and Associates found that the majority of off-roaders understand that staying on designated routes is "fundamental trail etiquette" and that going off trail is not "correct" off-road vehicle behavior. Id. at 11. The survey revealed, however, that regardless of this knowledge "as many as two-thirds of adult users go off the trail occasionally." Id. A significant percentage of riders, 15-20%, admitted to frequently breaking the rules and riding off of legal routes often. Id. Survey participants also stated that "others" ride off-route and cause most of the damage. Id. at 7. "Many reluctantly admit to having gone off trail "a couple times" but felt that it is permissible if rarely done "just this one time. "Id. Tellingly, the report concluded: "In a "nutshell," it is our premise that further information and education per se - will not result in substantial behavioral change." Id. at 1.	The study presented by this commenter serves to support the background statement on page 2 of the DEIS, which discusses how unmanaged motor vehicle use, particularly OHV use, has resulted in thousands of miles of unplanned roads and trails, erosion, watershed and habitat degradation, and impacts to cultural resource sites.

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Ltr#	Comment	Response to Comment
118	<p>Echoing these findings are the results of a 2003 survey of Wisconsin ATV users. A study of "motivations and attitudes" by graduate student Robert A. Smail at the University of Wisconsin - Stevens Point included a survey of user preferences for riding and found nearly two-thirds of respondents prefer to ride off maintained trails. Robert A. Smail, July 2007, Wisconsin all-terrain vehicle owners: Recreational Motivations and Attitudes Toward Regulation, A Thesis Submitted in partial fulfillment of the requirements of the degree Master Of Science In Natural Resources Resource Policy And Planning College Of Natural Resources University Of Wisconsin, Stevens Point, Wisconsin, copy obtained from author attached hereto. "Survey respondents were asked to indicate where they prefer to ride their ATV. Of the five possible choices, "On maintained trails" (28.5%) ranked third. The top choice was "On user created trails" (33.3%) followed closely by "Cross country, off trails and roads" (32.0%). In other words, 65.3% of all users prefer to ride off of maintained trails." Dr. Smail concluded that the survey results demonstrated that past orthodoxies premised on education and the assumed "positive peer-pressure" flowing from membership in established "rider clubs" are not adequate to generate trail-riding compliance, they had "no influence." Rather, "these results indicate that messages promoting responsible ATV riding or use will need to be reformulated and law enforcement will need to be increased in order to prevent resource damage and user conflict."</p>	<p>The study presented by this commenter serves to support the background statement on page 2 of the FEIS, which discusses how unmanaged motor vehicle use, particularly OHV use, has resulted in thousands of miles of unplanned roads and trails, erosion, watershed and habitat degradation, and impacts to cultural resource sites.</p>
118	<p>Finally, the U.S. Fish and Wildlife Service ("FWS") found a near universal disregard for motorized guidelines when the BLM experimented with a "voluntary off-road vehicle route system" in Nevada. The area in question serves as a refuge for the disappearing Sand Mountain Blue butterfly, a species proposed for listing under the Endangered Species Act. A 2006 monitoring report compiled over a three-year period found that "98 percent of all existing routes continued to be used and new routes were created, indicating an ongoing expansion of habitat degradation." Nevada Fish and Wildlife Office, U.S. Fish and Wildlife Service. 2007. 12-Month Finding on a Petition to List the Sand Mountain Blue Butterfly (<i>Euphilotes pallescens</i> ssp. <i>arenamontana</i>) as Threatened or Endangered with Critical Habitat. Federal Register, Vol. 72, No. 84. See pages 24260-61, attached hereto. The study also found that "about 50 percent of all noncompliance points occurred at or near red carbonite posts installed to alert riders that travel was discouraged in areas behind the posts" to protect sensitive butterfly habitat. The cumulative impacts of such "noncompliance points" were four-fold as each discouraged route experienced multiple incursions. Id. The FWS noted that "high levels of noncompliance occurred from the onset of implementation of the voluntary system, and the number of incursions into habitat outside of the encouraged routes increased in 2006."</p>	<p>The study presented by this commenter serves to support the background statement on page 2 of the FEIS, which discusses how unmanaged motor vehicle use, particularly OHV use, has resulted in thousands of miles of unplanned roads and trails, erosion, watershed and habitat degradation, and impacts to cultural resource sites.</p>

*Doc 15B
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Ltr#	Comment	Response to Comment
118 <i>MC 15B - 261-</i>	<p>Providing a broader overview, in September 2007, the Izaak Walton League, one of the country's oldest conservation groups, released a study of state game and fish managers revealing that 83% of wildlife managers have seen "resource damage to wildlife habitat" caused by ORVs and 72% cited "disruption of hunters during hunting season" as another impact from ORVs. "Off-Road Vehicle Impacts on Hunting and Fishing, The Izaak Walton League of America, 2007, attached hereto as Attachment H, at 15 (available from: http://www.iwla.org/publications/wilderness/OHVreport.pdf) Similarly, fully 60% of fisheries managers deemed ORV use to generate adverse impacts on riparian resources. Notably, 41% of wildlife and 50% of fisheries managers do not believe that current standards and protections adequately protect the resources they are responsible for with the perceived attitude of lawlessness playing a central role: "We have numerous rules and regulations, but many ORV riders have an attitude that they should not apply to them and many just ignore some rules because they want to ride someplace. It increases law enforcement effort and takes time from other areas." "There seems to be a misconception that just because you own a piece of equipment that can go almost anywhere, that you are entitled to go almost anywhere including public land dedicated to wildlife management. This needs to change." Further, "They go where they please, when they please, if they please. Not all do this, but many do. They cause significant upland erosion as well as stream side and in-stream damage." "Many ORV riders seemingly have no conservation ethic or appreciation for habitat management or understanding of the damage they cause." Another said: "While there is regulatory ability, there is insufficient enforcement response capability to adequately respond to illicit ORV use."</p>	<p>The study "Collision Course" presented in the attachment serves to support the background statement on page 2 of the FEIS, which discusses how unmanaged motor vehicle use, particularly OHV use, has resulted in thousands of miles of unplanned roads and trails, erosion, watershed and habitat degradation, and impacts to cultural resource sites.</p>
118	<p>In a closely tracking review on federal land managers, in December 2007, the Public Employees for Environmental Responsibility ("PEER") released the first-ever survey of federal rangers' views on off-road vehicle issues. "Rangers for Responsible Recreation: Off-Road Vehicle Issues Survey of SW Law Enforcement Professionals - Bureau of Land Management (BLM) & Forest Service (FS), 2007, (available from: http://www.peer.org/docs/az/07_11_12_sw_le_orv_survey_results.pdf) Strikingly: " 91% of respondent rangers agree that "off-road vehicles present a significant law enforcement problem in my jurisdiction"; " More than half (53%) feel "off-road vehicle problems in my jurisdiction are out of control"; and " 74% say that off-road abuses "are worse than they were five years ago" while fewer than one in six (15.2%) believe the situation is improving. Moreover, the survey found that rangers believe their agencies are unequal to the task of controlling ORV abuse: "62% believe their agency is not "prepared to deal with the ORV problems we are experiencing"; and "78% do not think their department "devotes adequate resources to cope with ORV problems."</p>	<p>The study presented in the attachment serves to support the background statement on page 2 of the FEIS, which discusses how unmanaged motor vehicle use, particularly OHV use, has resulted in thousands of miles of unplanned roads and trails, erosion, watershed and habitat degradation, and impacts to cultural resource sites. However, the study goes into law enforcement problems or issues, which are not the focus of implementing Subpart B of the TMR and does not support or change the analysis provided in that regard.</p>

More off-road vehicles, reckless drivers create surge in Minnesota deaths

2020's fatalities already are beyond normal, and fall's just beginning.

By Tony Kennedy Star Tribune
SEPTEMBER 29, 2020 — 12:39AM

See pages 2+3

Off-highway vehicle use in Minnesota, like that among ATVs, has increased since the pandemic hit.

Misty Eystad's life flashed before her eyes as she ran toward her daughter's motionless body.

It was July 4th weekend in 2017 at the cabin of a family friend. Before breakfast, the kids jumped onto a side-by-side ATV for a casual ride. Chalee, 13, was a passenger. Cale, her older brother, was the driver. When he turned to change directions, the vehicle rolled and pinned Chalee to the ground. Cale thought his sister was dead.

"When I came upon her she was not breathing and there was blood from her ears," Misty said. "I got down and talked to her, praying she would breathe."

Recalling that moment of fright still brings tears. Chalee ultimately gasped for air and was flown from the Detroit Lakes area to North Memorial Health Hospital in Robbinsdale. A second helicopter took Cale, who badly fractured his shoulders, hands and wrists. Both children suffered lasting injuries, and Chalee's fate wasn't certain until she emerged from a weeklong, medically induced coma.

"We were fortunate, but it goes the other way," Misty said. "Kids die. People die."

So far this year, an unprecedented surge in ATV ridership across Minnesota has led to 20 fatal accidents — more deaths than the state normally sees in a year. With fall hunting now contributing to one of the busiest periods of off-highway vehicle usage, the Department of Natural Resources is reminding riders to play it safe and heed safety precautions.

"One seemingly minor mishap can be the difference," said Jon Paurus, DNR Enforcement Division education program coordinator.

Starting in early March, Darrell Ness, 72, died from injuries he suffered on an early afternoon ride 3 miles west of Ashby. The Grant County Sheriff's Department said Ness was a passenger on an ATV that rolled. Since then, 19 riders and passengers as young as 9 have lost their lives in rollovers, collisions and vehicle ejections.

As sheriff's deputies and conservation officers continue to respond to accidents and a surge of complaints about the machines, they cite excessive speed, intoxication, lack of required safety training, underage driving, failure to obey traffic signs, and helmet violations as chronic problems. In addition, more ATV riders are driving where they shouldn't: paved roads, unauthorized private land and off-trail areas on public land.

"They're going wherever they want," said DNR conservation officer Amber Ladd. "I've never had this many issues or complaints."

Ladd, who is based in McGregor, said too many people are riding ATVs without educating themselves. State law requires any prospective ATV rider born after July 1, 1987, to complete safety training before operating away from private land. For youth ages 10 to 15, the online course must be coupled with a one-day, hands-on skills class. Any person under age 18, including toddlers, babies and other passengers, must wear a properly fitted, Department of Transportation-approved helmet.

"Lots of adults don't realize they have to have training, and there's lots of kids on ATVs with no helmets," Ladd said. →

Her territory inside Aitkin County hasn't experienced a fatal ATV accident this year, but Ladd said a serious crash over Labor Day weekend sent two people to the hospital. In that case, a dad and two kids were bucked off an ATV that took a corner too fast, she said.

According to this year's fatal accident statistics compiled by the DNR, six victims were younger than 20. Alcohol was cited as a factor in five of the 20 tragedies, and victims were not wearing helmets more than half the time. (The agency's report didn't specify if head injuries were the cause of death.)

The majority of crashes are happening on roads, not trails — a factor common in ATV deaths across the country. Safety tips published by the DNR list the avoidance of paved roads as one of the golden rules of ATV safety.

Minnesota has been expanding its off-road trail networks to accommodate legions of new riders. But manufacturers and enthusiasts say COVID-19 social changes have stirred more interest this year than ever.

Scott Wine, chief executive at Polaris Inc., said last month that demand for the company's off-road vehicles was unprecedented in May, June and July. The same torrid pace of sales has cut ATV inventories across the country. According to the September issue of Motorcycle

& Powersports News, the boom stems from the perception that ATVs are an answer to the question: "How do I have fun during a pandemic?"

In Minnesota last year, the DNR recorded 329,275 registrations of off-highway vehicles. ATVs are the most popular type, and so far this year there are nearly 24,000 new registrations, the DNR said.

Travis Hetteen is president of an ATV riding club in Beltrami County called Northwoods Riders. He said off-road vehicle traffic is up across the board. Some people new to the sport are buying big machines before they have operating experience, he said.

He agrees that inexperience and lack of training are contributing to accidents. But he noted that DNR safety classes in Minnesota were shut down from March until early August because of the coronavirus. He said he was glad to see them return.

Current ATV models can weigh more than 800 pounds and achieve speeds in excess of 80 mph. But even at low speeds, they can roll, said Misty Eystad. Her safety message to other parents is to take every ride seriously.

Her daughter, Chalee, and son, Cale, weren't wearing seat belts or helmets when they crashed. Observers believe that the ATV was moving only about 10 mph when it tipped while making a U-turn.

"The tendency is to think they are going slow enough, they'll be fine," she said. "But no matter how fast you are going or how slow ... anything can happen."

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The term "feasible and prudent" is one that is well known in environmental statutes. The phrase appears in both the Minnesota Environmental Rights Act, Minn. Stat. § 116B.09, subd. 2 (1982), and in the Minnesota Environmental Policy Act, Minn. Stat. § 116D.04, subd. 6 (1982).

The Metropolitan Waste Control Commission has requested that the following language be added to Subpart 6: "The fact that an alternative would be substantially more costly than a proposed discharge is evidence that the alternative is not prudent and feasible." Exhibit 11 at p. 4. The Commission is concerned that Subpart 6 of the rule will restrict expanded discharges from its Bayport and Stillwater treatment plants to the St. Croix River.

The Agency does not intend to include the Commission's suggested sentence in the rule. Costs will be a factor in evaluating alternatives to expanded discharges to the St. Croix River and other specified outstanding resource value waters, but costs are only one of many factors to be considered. Putting the Commission's language in the rule would elevate the cost factor above other important factors. Costs are not to be balanced against other factors. Protection of the outstanding resource value water will be of prime importance and it is only in unique and exceptional circumstances will a new or expanded discharge be allowed. The courts have already made that clear.

In Citizens to Preserve Overton Park v. Volpe, 401 U.S. 402 (1971), a case involving the construction of a highway through a parkland, the U.S. Supreme Court directly rejected the argument

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that a "feasible and prudent" test required a balancing of a wide range of competing interests. The Supreme Court said:

But no such wide-ranging endeavor was intended. It is obvious that in most cases considerations of cost, directness of route, and community disruption will indicate that parkland should be used for highway construction whenever possible

...

Congress clearly did not intend that cost and disruption of the community were to be ignored by the Secretary. But the very existence of the statutes indicates that protection of parkland was to be given paramount importance. The few green havens that are public parks were not to be lost unless there were truly unusual factors present in a particular case or the cost of community disruption resulting from alternative routes reached extraordinary magnitudes. If the statutes are to have any meaning, the Secretary cannot approve the destruction of parkland unless he finds that alternative routes present unique problems.

401 U.S. at 411.

The Minnesota Supreme Court has specifically adopted the Overton Park language. In County of Freeborn v. Bryson, 243 N.W.2d. 316 (1976), the Minnesota Court said:

The purpose and language of the Federal statute and our [Minnesota Environmental Rights] Act are substantially the same. Therefore, we follow the decision of the United States Supreme Court and give our statute a similar construction. [Citation omitted.]

As here applied, this construction means that, in the absence of unusual or extraordinary factors, the trial court must enjoin environmentally destructive conduct if a feasible and prudent alternative is shown.

243 N.W. 2d at 321.

Moreover, both the Minnesota Environmental Policy Act and the Minnesota Environmental Rights Act provide that "economic considerations alone will not justify [pollution, impairment, or destruction of the State's natural resources]." Minn. Stat. §§ 116D.04, subd. 6 and 116B.09, subd. 2 (1982).

LAWS of MINNESOTA Ch 4, art 3, s 3

2015 First Special Session

Subd. 5. Parks and Trails Management 74,064,000 73,650,000

Appropriations by Fund

2016 2017

General 24,967,000 24,427,000

Natural Resources 46,831,000 46,950,000

Game and Fish 2,266,000 2,273,000

\$1,075,000 the first year and \$1,075,000 the second year are from the water recreation account in the natural resources fund for enhancing public water access facilities.

\$5,740,000 the first year and \$5,740,000 the second year are from the natural resources fund for state

trail, park, and recreation area operations. This appropriation is from the revenue deposited in the natural

resources fund under Minnesota Statutes, section 297A.94, paragraph (e), clause (2).

\$1,005,000 the first year and \$1,005,000 the second year are from the natural resources fund for park and trail grants to local units of government on land to be maintained for at least 20 years for the purposes of the grants. This appropriation is from the revenue deposited in the natural resources fund under Minnesota Statutes, section 297A.94, paragraph (e), clause (4). Any unencumbered balance does not

cancel at the end of the first year and is available for the second year.

\$8,424,000 the first year and \$8,424,000 the second

year are from the snowmobile trails and enforcement account in the natural resources fund for

the snowmobile grants-in-aid program. Any unencumbered balance does not cancel at the end of the

*see 2nd page
for reference*

first year and is available for the second year.

\$1,360,000 the first year and \$1,360,000 the second year are from the natural resources fund for the off-highway vehicle grants-in-aid program. Of this amount, \$1,210,000 each year is from the all-terrain vehicle account; and \$150,000 each year is from the off-highway motorcycle account. Any unencumbered balance does not cancel at the end of the first year and is available for the second year.

\$75,000 the first year and \$75,000 the second year are from the cross-country ski account in the natural

resources fund for grooming and maintaining cross-country ski trails in state parks, trails, and recreation

areas.

\$250,000 the first year and \$250,000 the second year are from the state land and water conservation account (LAWCON) in the natural resources fund for priorities established by the commissioner for eligible

state projects and administrative and planning activities consistent with Minnesota Statutes, section

84.0264, and the federal Land and Water Conservation Fund Act. Any unencumbered balance does not cancel at the end of the first year and is available for the second year.

\$968,000 the first year and \$968,000 the second year are from the off-road vehicle account in the natural resources fund. Of this amount, \$568,000 each year is for parks and trails management for off-road vehicle purposes; \$325,000 each year is for the off-road vehicle grant in aid program; and \$75,000 each year is for a new full-time employee position or contract in northern Minnesota to work in conjunction with the Minnesota Four-Wheel Drive Association to address off-road vehicle touring routes and other issues related to off-road vehicle activities. Of this appropriation, the \$325,000 each year is onetime.

Trout Unlimited v. MINNESOTA DEPT. AGR.

[Annotate this Case](#)

528 N.W.2d 903 (1995)

TROUT UNLIMITED, INC., et al., Appellants, v. The MINNESOTA DEPARTMENT OF AGRICULTURE, Respondent.

No. C3-94-1900.

Court of Appeals of Minnesota.

March 7, 1995.

Review Denied April 27, 1995.

*See pg. 4 of document
highlighted text*

*905 Nicholas J. Spaeth, Steven M. Christenson, Dorsey & Whitney, Fargo, ND, for appellants.

Hubert H. Humphrey, III, Atty. Gen., Paul A. Strandberg, Asst. Atty. Gen., St. Paul, for respondent.

Considered and decided by DAVIES, P.J., and HUSPENI and FOLEY,[*] JJ.

OPINION

HUSPENI, Judge.

After reviewing an Environmental Assessment Worksheet (EAW) and comments responding thereto, the Commissioner of Agriculture (Commissioner) decided that an Environmental Impact Statement (EIS) was not required for a proposed irrigation project bordering Dead Horse Creek, a trout stream in Becker County.

Appellants Trout Unlimited, Inc. and the Osage Environmental Society filed an action in district court, seeking a declaratory judgment that an EIS was required for the irrigation project. The district court issued an order for summary judgment, concluding that the Commissioner had acted within his discretion when determining that there was no need for an EIS. Because we conclude that the Commissioner erred by failing to consider several comments received during the comment period, by failing to consider the potential cumulative effects of the project, and by relying on future permitting or monitoring efforts to control or redress potential problems, we reverse and remand to the Commissioner for preparation of an EIS.

FACTS

In early 1993, Triple J Farms applied for a water appropriation permit to irrigate approximately 140 acres of grass/brush land in Becker County, Minnesota. Triple J's proposed irrigation project is located on two sides of Dead Horse Creek, a trout stream. Regulations promulgated by the Minnesota Pollution Control Agency (PCA) provide that water taken from trout streams, if disinfected by approved methods such as simple chlorination, must meet the United States Health Department's drinking water standards.[1]

The land on both sides of Dead Horse Creek is very steep, particularly in portions of the ravine. Because of the steep slopes and coarse soil along the stream, a concern arose that the proposed irrigation could erode the stream banks, resulting in significant degradation. Interested citizens petitioned for environmental review of the irrigation project. The Minnesota Department of Natural Resources (DNR) and Minnesota Department of Agriculture (MDA) prepared an EAW

for the proposed project. Initially, the DNR was designated as the responsible governmental unit for the environment review process, but in June 1993, the MDA was substituted as the responsible governmental unit.

The EAW raised several concerns, including "a significant potential for erosion," that would "not likely *** be mitigable," and a "high potential for nitrate leaching under poorly-managed irrigated crops," requiring appropriate irrigation and nitrogen best management practices to reduce the potential impacts. The EAW also expressed a *906 concern that the clay layers separating the local aquifers could leak and allow movement of water between aquifer levels, which could result in the reduction of water flow in the trout stream during the late summer. The EAW also noted that future stages of Triple J's development were planned or likely. The EAW concluded that the current lack of information, the sensitive features of the site, and the high probability for adverse significant impacts to the trout stream required additional assessment and monitoring. The EAW also expressed a concern that any damages may not be mitigable, risking the state's prior investment in the stream as a trout habitat.

The EAW noted that the Becker County Soil and Water Conservation District (Conservation District) had approved a Conservation Plan for the proposed irrigation project, providing for a system of waterways, tillage residue requirements, and a 100-foot buffer strip between the crops and the stream. The EAW concluded, however, that the Conservation Plan required further modification, and that additional information was necessary to assess the level of projected erosion as a result of the irrigation project.

The EAW generated numerous comments from private citizens, organizations, and agencies. The DNR commented that insufficient information was currently available to make a recommendation on the need for an EIS. The DNR indicated that additional information was necessary concerning expected runoff of nutrients and pesticides to be applied during the irrigation process, the potential for erosion, future plans for farming and irrigation in the area, and plans for monitoring and enforcement.

The Department of Health expressed "serious concerns" with the proposed irrigation project, noting that it appeared to have "the potential for contamination of groundwater and surface water, with resultant negative impacts on drinking water and public health." Specifically, the Department of Health expressed concerns about erosion, fertilizer and pesticide leaching to groundwater, plans for future expansion or independent developments in the area, and a lack of monitoring plans.

The PCA also expressed concern about the lack of data in "several key areas," including nitrate runoff, erosion, and the possible existence of a subsurface connection between the source aquifer and the trout stream that could have "significant ramifications for creek water levels and temperatures." The PCA concluded that "the case for an EIS is compelling."

The comment period was extended[2] and the Conservation Plan was modified. The modified plan reduced the size of the project from 140 to 97 acres, and provided that, instead of a 100-foot buffer strip along the stream, as originally proposed, Triple J would keep 26 acres along the stream planted in alfalfa/hay, with small grain crops rotating every fourth year as a nurse crop for the alfalfa.

Nevertheless, the Department of Health, DNR, and PCA continued to express concern with the proposed irrigation project. The Department of Health stressed that additional information was necessary on the types and quantities of pesticides to be applied through irrigation and the plans of nearby landowners or Triple J for future similar projects.

The DNR recommended an EIS because the proposed irrigation project presented a "potential for significant environmental effects." The DNR indicated that there were risks of stream degradation that could occur before the DNR or MDA would have a chance to intercede. The DNR concluded that an EIS should address the potential for leachate discharge and migration, runoff impacts, and the potential for success of any proposed mitigation, including enforcement.

A memorandum from the PCA indicated a view that "significant environmental degradation would result" if the irrigation project were implemented. The PCA continued to recommend an EIS to explore further issues relating to thickness and permeability of the aquifers, potential ground water contamination from nitrate increases in the aquifers, *907 slope failure, sediment and nutrient erosion, and the effectiveness of the proposed buffer strips.

Despite the above concerns expressed by the DNR, PCA, and Department of Health, the Commissioner issued an order determining that the EAW had generated sufficient information to determine whether an EIS was necessary. The Commissioner concluded that an EIS was unnecessary because the proposed irrigation project did not have a potential for significant environmental effects. The Commissioner specifically noted: "Areas where potential environmental effects have been identified have been addressed by appropriate mitigative measures incorporated into the project design or are subject to mitigation by ongoing public regulatory authority." Appellants brought a declaratory judgment action in district court. The court concluded that the MDA acted within its discretion in determining that there is no need for an EIS for the proposed irrigation project.

ISSUES

1. Did the Commissioner err by failing to consider all of the comments generated by the EAW?
2. Did the Commissioner err by failing to consider the potential cumulative effects of similar projects in the area?
3. Did the Commissioner err by failing to consider the potential impacts of chemigation and/or fertigation on the trout stream?

ANALYSIS Scope and standard of review

The district court limited its review to the record before the Commissioner, thereby functioning in an appellate, rather than a *de novo*, capacity. Accordingly, we must

make an independent examination of [the] administrative agency's record and decision and arrive at our own conclusions as to the propriety of that determination without according any special deference to the same review conducted by the trial court.

Reserve Mining Co. v. Herbst, 256 N.W.2d 808, 824 (Minn.1977).

We review the Commissioner's decision to determine whether it is unreasonable, arbitrary, or capricious. See Carl Bolander & Sons Co. v. City of Minneapolis, 502 N.W.2d 203, 207 (Minn.1993) (citing Swanson v. City of Bloomington, 421 N.W.2d 307, 313 (Minn.1988)). An agency's decision is arbitrary or capricious if "it represents the agency's will, rather than its judgment." Mammenga v. Department of Human Servs., 442 N.W.2d 786, 789 (Minn. 1989) (citing Markwardt v. State Water Resources Bd., 254 N.W.2d 371, 374 (Minn.1977)). A decision will be deemed arbitrary and capricious if the agency relied on factors which the legislature had not intended it to consider, if it entirely failed to consider an important aspect of the problem, if it offered an explanation for the decision that runs counter to the evidence, or if the decision is so implausible that it could not be ascribed to a difference in view or the product of agency expertise. Motor Vehicle Manufacturers Assoc. v. State Farm Mut. Auto. Ins. Co., 463 U.S. 29, 43, 103 S. Ct. 2856, 2867, 77 L. Ed. 2d 443 (1983).

I. Extent of the record

Appellants have appended to their brief certain documents obtained from the MDA's records. The Commissioner claims that he did not consider these documents, but based his decision solely upon the Conservation Plan, the EAW, and the comments specifically addressed in his order. The Commissioner admits, however, that the documents appended to appellants' brief were available to him when he was considering the need for an EIS.

A responsible governmental unit's decision on the need for an EIS must be based on "the environmental assessment worksheet and the comments received during the comment period." Minn.Stat. § 116D.04, subd. 2a(b) (1992). The Commissioner argues that this language restricts the Commissioner to considering only the EAW and responses labeled "comments." We disagree, and decline *908 to read the statute as narrowly as the Commissioner urges. If the disputed documents were available and in the possession of the MDA, they are part of the record as defined by the statute, and should have been considered by the Commissioner when determining whether an EIS was necessary.

II. Cumulative effects of future projects

An EIS must be prepared for projects that have a "potential for significant environmental effects." Minn.Stat. § 116D.04, subd. 2a (1992). A responsible governmental unit should consider several criteria when deciding whether an EIS must be prepared. One of these factors is the "cumulative potential effects of related or anticipated future projects." Minn.R. 4410.1700, subp. 7B (1993). In addition, "[c]onnected actions and phased actions shall be considered a single project for purposes of the determination of need for an EIS." Id., subp. 9.

The Commissioner concluded:

Any potential impacts associated with possible future expansion of irrigation of cropland cannot be inferred from this project, nor can it be inferred that this project will significantly stimulate additional development of irrigated cropland. Since private decisions on whether to irrigate cropland involve individual financial, physical and environmental circumstances, one project is unlikely to have a significant effect on decisions on other projects in the area or the state.

In light of the record in this case, we conclude the above determination is arbitrary. The EAW itself stated that future stages of irrigation projects in the area were "planned or likely." A memorandum from the PCA stated that a nearby

landowner had three or four parcels of land that he hoped to convert to irrigate and farm, pending the outcome of the Triple J permit. This land was approximately one mile upstream from Triple J and adjacent to Dead Horse Creek.

Letters from the DNR and Department of Health suggested that it would be impossible to determine the potential for significant environmental effects associated with the irrigation project without determining the extent of future plans for farming and irrigation in the area. In fact, the MDA itself stated in a letter to Triple J that the Department of Health believed additional information was necessary on "the plans of nearby landowners in terms of similar farming operations."

III. Potential impact of chemigation and fertigation

When considering whether to require an EIS, a responsible governmental unit must consider the "type, extent, and reversibility of environmental effects" and "the extent to which the environmental effects are subject to mitigation by ongoing public regulatory authority." Minn.R. 4410.1700, subp. 7A, C. "Mitigation" includes avoiding or limiting the size of a project, repairing or restoring the environment, working to preserve or maintain the environment during the life of the project, or replacing or substituting resources. Minn.R. 4410.0200, subp. 51 (1993).

The EAW noted that chemicals could impact Dead Horse Creek in several ways, including:

[[i]ncreased movement of pesticides to surface water that stem from aerial or irrigation applied drift, increased pesticide application with the change in crops, pesticide adsorption to particles susceptible to erosional transport, and pesticides leaching to ground water that then could be transported to the stream.

The DNR, Department of Health, and PCA also expressed grave concerns that chemicals applied through the irrigation project could result in a potential for significant environmental effects.

The DNR notified the Commissioner that the likely impacts of herbicides, insecticides, and fungicides on the stream required assessment, and that it was impossible to determine the potential for significant environmental effects without determining the extent of the expected chemical input. The Department of Health also informed the *909 Commissioner that information regarding the types and quantities of pesticides, herbicides, and fertilizers was needed before issuing a permit, and that such information could be part of an EIS. The PCA also expressed a concern with the potential for chemical movement into the stream.

The MDA itself noted in a letter to Triple J that several questions needed to be answered before a decision could be made on an EIS, including "What types and extent of chemical inputs are expected to be used in this farming operation?" and "What measures will be taken to protect Dead Horse Creek from chemical or nutrient inputs associated with the proposed farming activity?"

The Commissioner, having before him a record containing the concerns highlighted in the EAW and expressed by the DNR, Department of Health and the PCA, recognized that "the potential for nitrate leaching through the upper aquifers into Dead Horse Creek is a major concern with respect to the proposed project." The Commissioner also recognized that Triple J would need a chemigation permit to apply any pesticides through the irrigation system and a fertilizer chemigation permit to apply fertilizers through the irrigation system. The Commissioner ultimately concluded, however, that: "Monitoring and permit conditions can identify significant impacts and modify or terminate the project if necessary."

Our review of the record and the applicable statutes convinces us that this conclusion cannot be sustained. Under the Commissioner's analysis, the irrigation project would go forward without an EIS and in the event significant environmental effects did occur, the Commissioner would then rely on monitoring or restrictive permitting procedures to reduce or eliminate those deleterious effects. The very purpose of an EIS, however, is to determine the potential for significant environmental effects before they occur. By deferring this issue to later permitting and monitoring decisions, the Commissioner abandoned his duty to require an EIS where there exists a "potential for significant environmental effects." Minn.Stat. § 116D.04, subd. 2a. The potential impacts of chemicals should be analyzed during the EIS process, rather than waiting until Triple J has expended time and effort on its irrigation and farming operations only to face the risk of later restriction or withdrawal of its permits.

Finally, the Commissioner erred by confining the environmental review process to the EAW, in derogation of the more extensive analysis contemplated by an EIS. The EAW is only a "brief document which is designed to set out the basic facts necessary to determine whether an environmental impact statement is required for a proposed action." Minn.Stat. § 116D.04, subd. 1a(c) (1992). See Bolander, 502 N.W.2d at 207 (EAW process is designed to discover whether a project may harm the environment, while EIS is "more extensive"). When an EAW has indicated, as here, that a project may harm the environment, use of that indication to conclude that an EIS is unnecessary, "makes a mockery of the EAW as a decision making tool." John H. Herman and Charles K. Dayton, Environmental Review: An Unfulfilled Promise Bench and Bar, July 1990 at 31, 36. The record in this case exemplifies the need for careful evaluation of and differentiation between the purpose served by an EAW and that served by an EIS. The record also supports but one conclusion: in this case an EIS must be prepared.

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DECISION

As the Environmental Assessment Worksheet revealed, Triple J's proposed irrigation project poses a potential for significant environmental effects. We therefore reverse and remand to the Commissioner for preparation of an Environmental Impact Statement.

Reversed and remanded.

NOTES

[*] Retired judge of the Minnesota Court of Appeals, serving by appointment pursuant to Minn. Const. art. VI, § 10.

[1] Minn.R. 7050.0420, 7050.0220, subp. 2B (1993).

[2] Minn.R. 4410.1700 (1993) authorizes a responsible governmental unit to postpone a decision on the need for an EIS for up to 30 days in order to obtain additional information.



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MINNESOTA DIVISION IZAAK WALTON LEAGUE OF AMERICA

Our Mission: To conserve, restore, and promote the sustainable use and enjoyment of our natural resources, including soil, air, woods, waters, and wildlife.

May 17, 2019

To Whom it may Concern,

The Izaak Walton League is a 97 year-old grassroots conservation organization with 16 local chapters across Minnesota. Our mission is to conserve, restore and promote the sustainable use and enjoyment of our natural resources.

Izaak Walton League members recently approved a resolution opposing funding for the proposed Border-to-Border trail system as presently designed. Our concerns involve the potential for significant environmental effects from increased heavy traffic from vehicles designed for off-road use on lightly-used roads traversing sensitive environments. The proposed route includes many wetlands, large tracts of forests and numerous stream crossings, and presents the potential for increased illegal riding off-road in these environments.

The Izaak Walton League recognizes the legitimate desires of the ORV culture to enjoy their motorized form of recreation. We support as an alternative closed-loop, contained facilities that can and have been developed in our state and others to sustainably accommodate this high-impact motorized sport.

Ted Suss

President

Izaak Walton League – Minnesota Division

RESOLUTION OPPOSING Border to Border ROUTE FUNDING

Adopted at the Annual Meeting April 27, 2019

Whereas: The Izaak Walton League was founded in 1922 to conserve outdoor America for future generations and;

Whereas: The League's mission is to conserve, restore, and promote the sustainable use and enjoyment of our natural resources, including soil, air, woods, waters, and wildlife and;

Whereas: In carrying out this mission it is the League's practice to bring attention to certain public or private activities, policies or projects that either support or detract from achievement of this mission and give voice to League members concerns, and;

Whereas: The DNR Parks and Trails Division is requesting legislative funding for a Border to Border (B2B) Touring Route as an opportunity to open-up and promote use of more public lands and roads by Off-Road Vehicles (ORVs), and;

Whereas: The purpose of this proposal is to provide nearly 900 miles of entertaining and challenging (low grade) public road connections bridging across the entire northern tier of Northern Minnesota, and;

Whereas: The proposed route opens some of Minnesota's most sensitive and high-value streams, wetlands and forests to abuse by scoff-law drivers who refuse to stay on the designated road surfaces (there is a higher percentage of bad-apple drivers in the OHV culture) and;

Whereas: Even the legal ORV uses promoted by this project are predicted to cause extensive damage to roads leading to secondary damage to forest, wetland and outstanding value streams (including trout streams) proposed to be traversed.

Whereas: These high-powered trucks are designed for rugged terrain so the attraction to this form of motorized recreation is in driving them aggressively, and;

Whereas: Most ORV's feature high clearance and very aggressive tires tread built for gripping jagged ground where ORV aficionados enjoy driving them, and;

Whereas: Several classes of Upper Midwest Mud Racing Association (UMMRA) "Street Class" type ORV trucks are eligible for highway licensing and therefore will be allowed to use the B2B route, and;

Whereas: This ORV route will not be a slow-speed facility as advertized but will likely turn into a test course for high-powered, destructive trucks – built for uneven terrain, and;

Whereas: The public highways and roads targeted for this project are presently all available for reasonable (low impact) motorized tourism uses such as hunting, sight-seeing, bird watching and other recreational uses that is inclusive of the OHV culture but in a far more dispersed manner, and;

Whereas: The B2B project, as proposed would intensify the highest impact type motorized uses by actively promoting the route to in-state and interstate off-roading clubs in the Minnesota Four-Wheel Drive Assn. and the National Off-highway Vehicle Conservation Council (NOVCC) thus potentially increasing high impact uses on a single designated, signed and mapped route, and;

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Whereas: Funding for establishing and maintaining the B2B route would come from the unintended use of unrefunded gas tax revenue. These gas tax revenues that were originally diverted from the dedicated highway fund for projects that were truly off-highway in nature (such as snow-mobile, ATV trails and other OHV facilities). The B2B project actually proposes these gas tax funds be used for a project designed to be ON rather than Off-Highways and roads, and will usurp these funds to repair predictable damage caused by the use of the project;

Whereas: Project proposers readily admit that the B2B will cause damages to rural roads, especially minimum maintenance and forest service roads in addition to farm to market township and county roads;

Whereas: Counties, Townships as well as State and National Forest road authorities along the proposed 900 mile B2B Route are faced with predicted increases in road repair costs with little or no benefit to local economies to offset these costs, and;

Whereas; Proposed B2B funding legislation requires Counties and Townships to keep and provide extensive documentation of increased road repair costs directly attributable to B2B users before they can qualify for reimbursement of these road repair costs.

Whereas: The Izaak Walton League recognizes the legitimate desires of the ORV culture to enjoy their motorized form of recreation the League also is aware that certain types of closed-loop, contained facilities can and have been developed to sustainably accommodate this high-impact motorized sport.

THEREFORE BE IT RESOLVED: that the Minnesota Division of the Izaak Walton League of America in Convention on April 27th, 2019 finds the proposed B2B Route very unsustainable and highly inconsistent with its mission to conserve, restore, and promote the sustainable use and enjoyment of our natural resources, including soil, air, woods, waters, and wildlife and;

BE IT FURTHER RESOLVED: That the League oppose the funding for the B2B project as presently designed, whether from general funds or dedicated gas tax funds as proposed in Minnesota H.F. No. 1454 and S.F No. 1599, and;

BE IT FUTHER RESOLVED: That the League affirmatively communicate its opposition to the proposed B2B project to the Minnesota House and Senate members, Governor Walz and the Department of Natural Resources, and;

BE IT FURTHER RESOLVED: That should the B2B be authorized and funded by the Legislature the League hereby requests the Department of Natural Resources be required to prepare a full Environmental Assessment and/or Environmental Impact Statement to examine impacts, damage mitigation measures and all reasonable and prudent alternatives to the project before proceeding to implement it.

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North Star Chapter
2327 East Franklin Avenue, Suite 1
Minneapolis, MN 55406-4420

Mary Straka
Minnesota Department of Natural Resources (DNR), Parks and Trails Division
500 Lafayette Road
St. Paul, MN 55155

RE: Border to Border Touring Route

March 25, 2018

Thank you for providing this opportunity to comment on the Border to Border Touring Route. The comments herein are submitted on behalf of the Sierra Club North Star Chapter. Founded in 1968 the Sierra Club North Star Chapter is a non-profit environmental organization representing over 17,000 members across Minnesota. The Sierra Club works to safeguard the health of our communities, protect wildlife, and preserve our remaining wild places through grassroots activism, public education, lobbying, and litigation. As a leading grassroots voice working to preserve and protect Minnesota's environment, we involve volunteer leaders to act through environmental advocacy, community organizing, and outdoor exploration. We participate in the administrative process to encourage environmental health and sustainability, long term wildlife and habitat protection, and biodiversity goals.

The DNR plans to use the Border to Border Touring Route as an opportunity to open-up more areas to Off-Road Vehicles (ORVs). These high-powered trucks are designed for bumpy terrain. The fun of driving them is in driving them roughly. Most feature big tires built for ripping up the jagged ground where their riders often enjoy driving them. The purpose of this proposal is to provide entertaining and challenging roads connections for ORVs. This will not be a slow speed route for highway licensed vehicles, it will likely turn into a test course for high powered, destructive trucks – built for uneven terrain.

ORV Impacts

Increases in ORV use are aggregating damage to precious natural resources on our public lands. OHVs lead to: damage to water and soil resources, erosion, sedimentation, spread of non-native invasive species (NNIS), air and noise pollution, disruption to other forest users, increases in motorized traffic and destruction of sensitive species habitat. OHV routes should never be close to wetlands, streams, rivers, lakes or steep slopes. These landscapes may draw riders off-trail leading to irreparable damage.

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Because the ORV use in Minnesota is increasing exponentially the increase in damage to natural resources, sensitive habitats, and our precious wetlands, streams, lake shores and rivers has far reaching impacts to our land based and aquatic wildlife. This use has also caused increased conflicts with quiet use recreation and private landowner trespass. The Sierra Club has concerns with the unregulated usage of the vehicles, and the **cumulative** resource damage that is the result.

Old unused logging roads should be decommissioned, not opened to ORV traffic. This just further exasperates the problem of fragmentation in our northern forests. Fragmentation is leading to the decline of many animal species. How will this plan affect the Canada lynx and moose populations?

Our public forests are not the place for these environmental wrecking machines. Instead there are several off-road courses that cater to these kinds of vehicles. They are on private property and ORV owners can pay a fee to take their trucks out on the course where hills, mud, and rocky terrain are dedicated specifically to this purpose. The use and preservation of our public forests need to focus on other interests, such as sensitive species protection, biodiversity, water quality, ecosystem preservation, reduction of fragmentation, and climate change considerations.

Management Capacity, Lack of DNR Oversight, and Failure to Due Diligence

DNR proposes to delegate management of the Project to the National Off-Highway Vehicle Conservation Council (NOHVCC). NOHVCC is an OHV industry funded and dominated organization with no discernable record in managing projects of this type. DNR appears to have failed to “due diligence” in developing a business relationship with NOHVCC. The details of this relationship should be made public before the project is approved. NOHVCC capacity to manage the Project should be evaluated as should DNR plans to exercise oversight.

Federal Jurisdiction

The Border to Border Project proposes to make use of National Forest roads which are under Federal jurisdiction. Map 4 alone identifies four such roads, NF 193, 2196, 2199, and 2423. USFS has regulations providing for OHV travel on certain NF roads, including provisions which limit travel on higher level roads. USFS should reasonably seek public comment before its participation is authorized. Has USFS been approached regarding participation?

Tribal Consultation and Jurisdiction

DNR provides no information that Tribes have been consulted in development of the Project. Most importantly, Map 4 shows Border to Border passing through the Leech Lake Reservation where the Tribe has jurisdiction. Tribal approval must be obtained before the Project may be implemented. Can responsibility for obtaining approval be delegated to another entity, NOHVCC?

Likewise, Border to Border will pass through lands subject to 1854 and other treaties providing for tribal hunting, fishing, and gathering. Tribes should be consulted on this possible destructive intrusion on hunting, fishing, gathering lands.

Enforcement

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Increasing trail ~~mi~~leage for ORV riders means increasing illegal trespass into the forest by these destructive machines. Many ORV riders knowingly and intentionally ride off-trail, this is part of the excitement and the ~~adren~~aline-rush of taking out their ORV. Minnesota has an extensive history – and ongoing reputation, for ~~not~~ adequately enforcing resource protection when it comes to ORVs. Illegal access is the norm and ~~can~~ be expected in the future. With so many new miles open to ORVs, many of them back-roads not ~~frequent~~ly traveled, how will adequate enforcement of the rules occur?

Border to Border ~~will~~ bring increased usage to currently little used roads. The Project will also bring a different clientele ~~to~~, for example, Lake Vermillion State Park through which the trail is shown to pass. Is DNR prepared ~~to~~ address questions of law enforcement, including but not limited to, DNR properties?

The Sierra Club North ~~Star~~ Chapter opposes this project. We are especially concerned with lack of tribal consultation, locating ~~these~~ “trails” near wetlands, steep slopes, and sensitive species habitats, and the lack of true oversight for managing illegal activity. This project will lead to excessive damage to our public land resources.

Sincerely,

The Sierra Club North ~~Star~~ Chapter
2327 East Franklin Avenue, Suite 1
Minneapolis, MN 55406-1024

One of the principal concerns identified by County SWCDs for the Lake Superior North – Watershed is groundwater protection, for both quality and quantity. Groundwater withdrawals have increased nearly 30% over the last 20 years, partly due to the rising demand for water supply for private consumption and recreational water related needs. It is estimated that the development pressure is moderate in some parts of the watershed where land is converted from timberland, resorts and lakeshore into home and recreation development (USDA-NRCS). This increase in recreational development can be seen with a significant increase ($p=0.001$) from 1994 to 2013 in non-crop irrigation for golf courses and special categories. At this time, aquifer drawdown is now a concern; however, if water usage and land use conversion continue to increase, the probability of the water table being drawn downwards also increases. It is for this reason that the MNDNR monitors and takes precautions when permitting water use appropriations.

Groundwater quality is based on the sensitivity of the aquifers and the effects of naturally occurring and anthropogenic influences for constituents found in the water. Special consideration should be practiced in areas of high groundwater contamination susceptibility, which are sparsely located throughout the watershed. Overall, the groundwater quality of the watershed appears to be healthy, despite some exceedances of constituents, including arsenic. However, the primary source of contamination for this watershed is geology. Additional and continued monitoring will increase the understanding of the health of the watershed and its groundwater resources and aid in identifying the extent of the issues present and risk associated. Increased localized monitoring efforts will help accurately define the risks and extent of any issues within the watershed. Adoption of BMPs will benefit both surface and groundwater.

While land management, riparian and shoreland development, and road-stream intersections may represent acute threats to aquatic health in the Lake Superior – North Watershed, longer-term and more nebulous threats may be posed by climate change, and the interaction of climate change with other stressors. Many of the watershed's streams support sensitive, stenothermic organisms that depend on perennial, coldwater streams carrying low concentrations of sediment and nutrients. These habitat and water quality conditions are the result of interacting factors of climate, hydrogeology, and land cover, and may be degraded by changes in any of these factors. Predictive models incorporating climate and land use changes suggest that aquatic resources of the Lake Superior – North Watershed are likely to experience higher temperatures, reduced dissolved oxygen, increased erosion, and other associated stress in the near future (Johnson et al. 2013, Herb et al. 2014). These changes are likely to have negative effects on the health of aquatic systems, though planning and BMP implementation may mitigate some impacts. For example, understanding the importance of small, cold tributaries to the ecological integrity of larger river systems may be of critical importance in protection planning efforts. Tributaries often spawning and nursery habitat for trout and other fishes, and may serve as critical refugia for fish and other aquatic organisms during periods of thermal stress. A watershed-based focus that recognizes the connection between landscapes, riverscapes, and the condition of aquatic resources will be essential to protection and restoration efforts.

In general, aquatic habitats in the Lake Superior – North Watershed are in very good condition; streams, lakes, and wetlands rank among the highest-quality in the state, and some represent near-reference quality examples at a national scale. Stream biological monitoring surveys suggest that sensitive indicator taxa are widespread and abundant, and several rare species of fish and macroinvertebrates were observed. Many streams were designated as exceptional aquatic resources, which should provide a higher level of protection from degradation. From a protection and restoration standpoint, the watershed possesses several favorable characteristics. A relatively high proportion of its lands are already under some form of protective management (e.g., state parks, federal wilderness designation, AMAs), and much of the remainder is administered by public agencies charged with incorporating water quality considerations in their management and planning efforts. The watershed's aquatic resources are

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Executive summary

The Rainy River-Headwaters Watershed (09030001) lies in northeastern Minnesota and covers approximately 2,954 mi² or 1,890,689 acres. A total of 1,273 lakes (>10 acres) and 408 stream reaches reside within this watershed. Streams are generally small to moderate in channel size, short, and vary in gradient; many are direct tributaries to the many lakes in the watershed. Both drinking water quality and the recreational value of lakes and streams are important to the health and wealth of local economies throughout this watershed. The waterbodies also provide habitat for aquatic life, riparian corridors for wildlife. The immaculate waters found within this watershed not only produce some of the highest quality fisheries in the state but also offer visitors many scenic and natural views. The most visited wilderness area (Boundary Waters Canoe Area) in the United States is located within this watershed, with water as a major focal point. Today over 99% of the Rainy River-Headwaters Watershed is undeveloped and utilized for timber production, hunting, fishing, hiking, and other recreational opportunities. Large tracts of public land exist within this watershed, including county land, national and state forests, wildlife management areas, scientific and natural areas, state parks, and a national park.

In 2014, the Minnesota Pollution Control Agency (MPCA) undertook an intensive watershed monitoring (IWM) effort of surface waters within the Rainy River-Headwaters Watershed. Sixty-two stream stations were sampled for biology at the outlets of variable sized subwatersheds. These locations included the mouth of the Ash, Bear Island, Black Duck, Cross, Dumbbell, Dunka, Island, Little Indian Sioux, Little Isabella, Shagawa, South Kawishiwi, and Stony rivers, as well as the upstream outlets of major tributaries, and the headwater outlets of smaller streams. Cook and Lake County Soil and Water Conservation Districts (SWCD) and Vermilion Community College completed stream water chemistry sampling at the outlets of 13 streams. In addition, the MPCA, Lake County SWCD, Natural Resources Research Institute, National Park Service, and local volunteers completed lake monitoring on 60 lakes. In 2016, a holistic approach was taken to assess all surface waterbodies within the Rainy River-Headwaters Watershed for support of aquatic life, recreation, and consumption (where sufficient data was available). Additional data from other state and federal agencies, local units of government, lake associations, and/or individuals were used in the assessment of these designated beneficial uses. Sixty- four stream segments and 245 lakes were assessed in this effort.

Of the assessed streams, 97% fully supported aquatic life and 92% fully supported aquatic recreation. There were impairments for total suspended solids (TSS), Escherichia coli (bacteria), and mercury in fish. All but one lake assessed met eutrophication standards for lake trout, cold, and warm-water lakes in the Northern Lakes and Forest ecoregion, and had good water quality that indicated oligotrophic to mesotrophic conditions. A number of lakes deep within the Boundary Waters Canoe Area Wilderness (BWC AW) fully supported aquatic recreation based on satellite estimated Secchi transparency. One- hundred and eighty-eight lakes had existing aquatic consumption impairments due to an exceedance of standards for mercury in fish tissue. The Minnesota Department of Health (MDH) has issued numerous fish consumption advisories for specific lakes throughout this watershed.

Overall, water quality conditions are good to excellent and can be attributed to the forest and wetlands that dominate land cover within the Rainy River-Headwaters Watershed. A limited number of impairments do occur and persist throughout the watershed. They are typically limited to the lower reaches where stressors from land use practices may accumulate. Impairments found within this watershed are likely a function of both natural and anthropogenic stressors. Historical and recent forest cover changes, along with urban/industrial development, and draining of wetlands are likely stressors affecting biological communities within the watershed. The majority of the waterbodies within this watershed had exceptional biological, chemical, and physical characteristics that are worthy of additional protection.

Summaries and recommendations

The Rainy River-Headwaters Watershed contains a large portion of the BWC AW, which is best known for its scenic views, towering pines, and magnificent cascades that connect large bodies of water. This entire watershed, including much of northeastern Minnesota, is comprised of vast tracts of upland and lowland forest. Recreational opportunities are abundant throughout this forested landscape with its streams and lakes as major focal points. This scenic watershed is only 11.4% privately owned leaving the majority of the land undeveloped and open to the public (NRCS, 2007). The undeveloped nature of this watershed is undoubtedly a key reason for the high water quality found in the majority of the Rainy River-Headwaters Watershed.

Biological monitoring results identified numerous sensitive fish species within the Rainy River-Headwaters Watershed. All of the stream reaches that were assessable met biological criteria for both fish and macroinvertebrates, and at times significantly exceeded the biological impairment thresholds. Though many of the reaches were found to be in good biological standing, some chemical aquatic life indicators exceeded state standards. The chemical impairments, although not reflected in some fish and macroinvertebrate Index of Biological Integrity scores, may have a negative effect on biological composition, diversity, and overall health. In-stream habitat, as indicated by Minnesota Stream Habitat Assessment (MSHA) scores, ranged from poor to good, with a relatively high amount of quality habitat accessible for biological communities. Many stations had a variety of habitat that allowed a diversity of species to persist and therefore to be collected during sampling for this report. In some cases, high quality in-stream habitat may be mitigating the negative consequences of point or non-point pollutants at the few locations where these stressors exist.

Lake water quality is in good to excellent conditions throughout the watershed. Fifty nine of the 60 lakes sampled meet the eutrophication standards. Natural background conditions from the surrounding drainage were determined to be the cause of high nutrients and algae in shallow Blueberry Lake near Ely, the one lake that did not meet standards. Over 185 lakes within the BWC AW met the eutrophication standards, based on satellite-estimated Secchi transparency. Sand, Kabetogama, Johnson, and Onagon lakes were closest to being designated as impaired. While these lakes do meet standards, they would benefit from additional monitoring even though these relatively productive waters are likely heavily influenced by natural conditions.

Groundwater within the Rainy River-Headwaters Watershed is generally of good quality. Chemical and mineral content of groundwater is heavily influenced by residence time and contact with bedrock. Recharge to these aquifers is limited due to the surficial geology. Shallow aquifers provide sufficient quantities of groundwater for domestic use and the existing rate of high-capacity groundwater use does not appear to be negatively impacting surface water flow.

Impairments found on stream segments within the Rainy River-Headwaters Watershed are likely a function of both natural and anthropogenic stressors. Streams with more erosive soils tend to have higher suspended sediment in lower reaches. These conditions likely have a natural component, but the suspended sediment can result in stressful conditions for biological communities and may be amplified by poor land use practices. Aquatic consumption impairments, caused primarily by atmospheric deposition of mercury from the global burning of fossil fuels, are one of the widest spread impairments lakes and rivers throughout the watershed. Both DO and pH met standards, reflecting the undeveloped nature of the watershed. Bacteria levels (*E. coli*) were good for most subwatersheds. The Black Duck River Subwatershed had an *E. coli* impairment that may be tied to current land use within that specific drainage.

Dec 23 - 275 -

Overall, lakes and streams within the Rainy River-Headwaters Watershed have benefited from little developmental pressure. However, these systems are highly sensitive to anthropogenic stressors like most waterbodies in northern Minnesota. A continued vigilance is necessary to monitor areas where developmental pressures are or will be expected to occur. Point and non-point pollutants are affecting water quality and quantity in select drainages, and will be addressed in future TMDLs. A combination of stressors, including urban/industrial development, forest cover change, draining of wetlands/lakes, and the damming of streams, are likely contributing to the reduction of sensitive species in some stream reaches. The Shagawa and Dunka River Subwatersheds appeared to be the most impacted by urban/industrial development. An emphasis should be given to maintaining natural vegetative buffer areas along shorelines to prevent overland runoff and reduce erosion potential in these more developed watersheds to maintain the existing high quality of the lakes and streams. Some of the top aquatic resources found in this watershed include Bezhik Creek, Denley Creek, and Little Isabella River. A complete list of the top 10 highest quality stream resources within this watershed as indicated by biological (F-IBI and M-IBI) and physical (MSHA) parameters are displayed in Table 59. Those streams that have exceptional biological, chemical, and physical parameters are worthy of additional protections in order to preserve their valuable aquatic resources.

Table 59. Top 10 stream resources in the Rainy River-Headwaters Watershed as indicated by biological and physical parameters.

Rank	Stream Name	Biological Station	Reach Description
1	Bezhik Creek	14RN036	BWCAW Boundary to Moose River
2	Denley Creek	14RN067	Nira Creek to Stony River
3	Little Isabella River	14RN079	Headwaters to Flat Horn Lake
4	Mitawan Creek	05RN073, 06RN014, 05RN190	Kitigan Lake to BWCAW Boundary
5	Snake River	14RN064	BWCAW Boundary to T61 R10W S12, North Line
6	Jack Pine Creek	14RN081	Headwaters to Mitawan Creek
7	Cross River	14RN011	Harn Lake to Gunflint Lake
8	Moose River	14RN035, 05RN076, 14RN034	BWCAW Boundary to BWCAW Boundary
9	Stony River	14RN073, 14RN072, 05RN074, 14RN007	Headwaters to Birch Lake
10	Arrowhead Creek	10RN070, 14RN086, 14RN085	Spear Lake to Island River

Doc 23A -275A-

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Los Angeles Times

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CLIMATE & ENVIRONMENT

Scientists solve mystery of mass coho salmon deaths. The killer? A chemical from car tires



From left, researchers Jen McIntyre, Edward Kolodziej and Zhenyu Tian study the stormwater impacts on coho salmon in Longfellow Creek in the Seattle area. (Mark Stone / University of Washington)

DOC 23A -275B-

By ROSANNA XIA | STAFF WRITER

DEC. 3, 2020 | 11 AM



When officials in Seattle spent millions of dollars restoring the creeks along Puget Sound — tending to the vegetation, making the stream beds less muddy, building better homes for fish — they were thrilled to see coho salmon reappear.

But when it rained, more than half, sometimes all, of the coho in a creek would suffer a sudden death.

These mysterious die-offs — an alarming phenomenon that has been reported from Northern California to British Columbia — have stumped biologists and toxicologists for decades. Numerous tests ruled out pesticides, disease and other possible causes, such as hot temperatures and low dissolved oxygen.

Now, after 20 years of investigation, researchers in Washington state, San Francisco and Los Angeles say they have found the culprit: a very poisonous yet little-known chemical related to a preservative used in car tires.

DOC 23A -275B-

The chemical is just one of a vast number of contaminants that washes off roads whenever it rains. This giant soup of pollutants, which includes trillions of microplastics, rushes down drains and into creeks and ultimately into the sea.

"We pretty much figured out that anywhere there's a road and people are driving their car, little bits of tire end up coming off your tire and end up in the stormwater that flows off that road," said Ed Kolodziej, an environmental engineer and chemist at the University of Washington (Tacoma/Seattle), whose lab led a study that was published Thursday in the journal *Science*. "We were able to get all the way down to this one highly toxic chemical — something that kills large fish quickly and we think is probably found on every single busy road in the world."

Coho salmon, also known as silver salmon, are prized among fishermen and an important indicator species — the canary in the coal mine for coastal watersheds along the northern Pacific Ocean. Their range has historically stretched from the creeks nestled in the redwood forests near Santa Cruz all the way north to the waters of Alaska. The few coho populations that still exist in California are either endangered or threatened.

The fish are born in freshwater streams, where they stay for about a year before making the long journey through rivers and estuaries and into the ocean. They return a year and a half later to lay and fertilize eggs before dying. Many obstacles have made this journey across different environments more difficult: Shrinking estuaries, blocked passages from dams and culverts, as well as drought and a changing climate.

SCIENCE

Drought blocking passages to sea for California coho salmon

Feb. 9, 2014

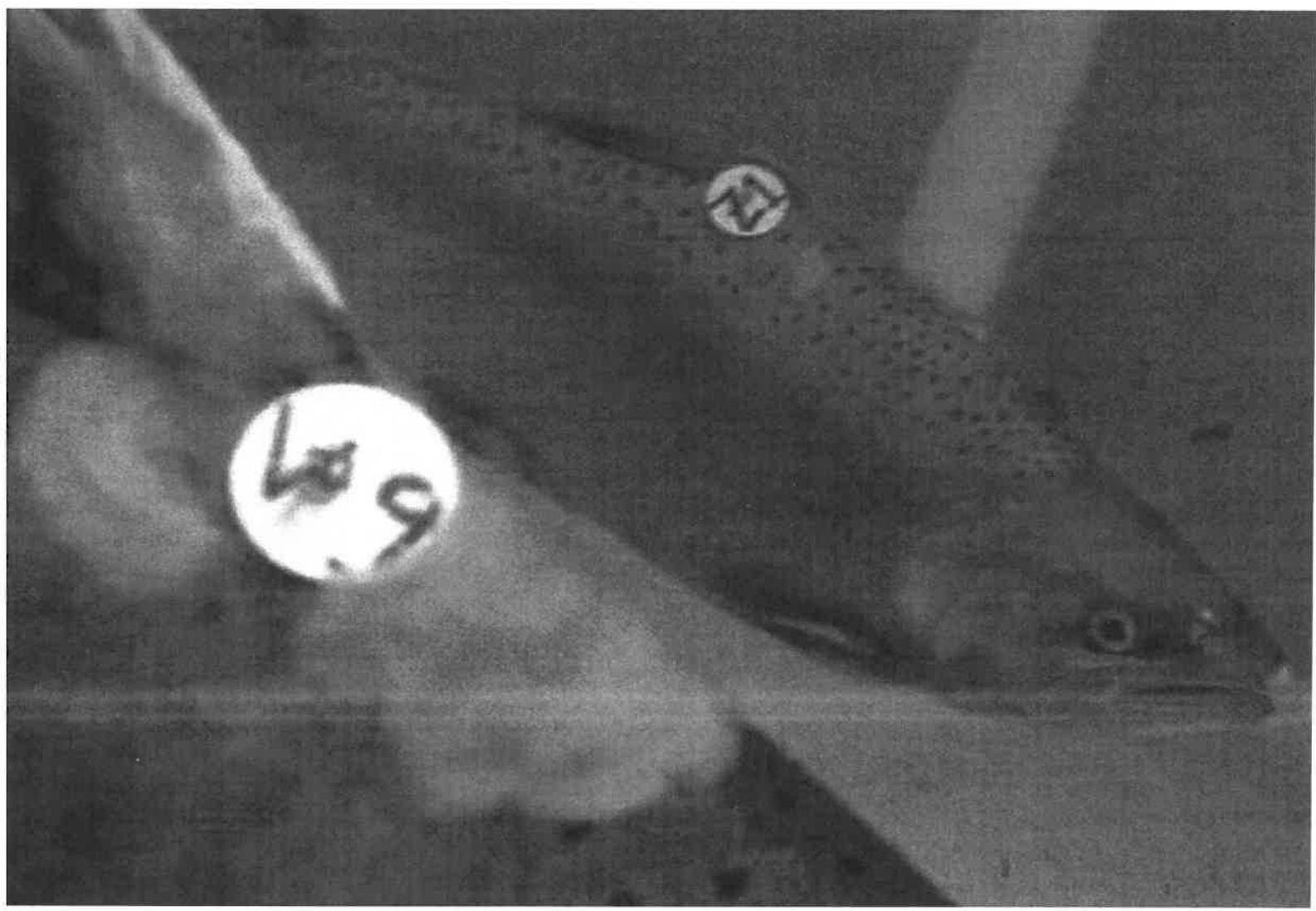
"While we often monitor temperature and dissolved oxygen levels, much more could be done to test for toxicity," said Mariska Obedzinski, a California Sea Grant fisheries biologist who leads monitoring and salmon recovery research on the Russian River and was shocked to see the findings out of Puget Sound.

"With so many chemicals out there," she said, "it is overwhelming to know what to test for, so the results of this study will help us home in on testing for a chemical that we now know causes acute mortality."

DOC 23A -275D-

Peter Moyle, a longtime salmon expert and emeritus professor at UC Davis, recalled the four small streams in San Francisco Bay that once had coho. He has been following the Puget Sound research, which he is also not affiliated with, and now wonders whether all the roads and major freeways that crossed these creeks contributed to their disappearance decades ago, despite all the restoration efforts.

"The challenge when you talk about declines of really sensitive fish like coho salmon, is that there are so many things that are affecting them simultaneously, it's hard to pinpoint one," he said. "That's why it's so interesting that in these Puget Sound streams, they found this one chemical that seems to be the smoking gun."



Conservation hatcheries in California have been raising tens of thousands of coho salmon to release into creeks. (Robert Gauthier / Los Angeles Times)

The scientists in Washington state spent years studying dozens of streams — looking for patterns and comparing samples from pristine creeks, to those in more urban areas. They narrowed the culprit down to stormwater, then to creeks that were near busier roads, and finally to the wear and tear of car tires.

Researchers then soaked tire bits in room temperature water for about 24 hours. As many as 1,500 to 2,800

chemicals would leach out and, using high-resolution mass spectrometry, the team methodically identified and analyzed these compounds.

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They tried sectioning this tire cocktail into different chemical properties, such as removing all metals from the solution. Then they tested these different sub-mixtures to see which ones were still toxic to the salmon. They repeated this process until only a few chemicals were left — including one mysterious speck of purple that they knew very little about.

“We knew that the chemical that we thought was toxic had 18 carbons, 22 hydrogens, two nitrogens and two oxygens. And we kept trying to figure out what it was,” said Zhenyu Tian, the study’s lead author and a research scientist at the Center for Urban Waters at University of Washington Tacoma. “Then one day in December, it was just like bing! in my mind. The killer chemical might not be a chemical directly added to the tire, but something related.”

The smoking gun turned out to be related to a chemical called 6PPD, which is essentially a preservative to keep car tires from breaking down too quickly. When 6PPD hits the road and reacts with ozone gas, the chemical transforms into multiple new chemicals, including a compound known as 6PPD-quinone.

Not much is known about 6PPD-quinone, but it does appear to be very toxic (at about 1 microgram per liter) and does not degrade as quickly as 6PPD.

It remains unclear how exactly this chemical kills coho salmon, but it may be doing something to the lining of the salmon’s vascular system, said Jen McIntyre, an aquatic ecotoxicologist at Washington State University who has been studying this mystery for more than 15 years.

Once coho are exposed to 6PPD-quinone, they begin to breathe erratically — almost like they’re gasping for air. They lose equilibrium and start spiraling in circles, unable to stay upright in the water. Eventually they drop to the bottom, where they stop moving and die.

McIntyre has begun testing this toxin on five other Pacific salmon species, which have shown different levels of sensitivity. She’s also curious how 6PPD-quinone might affect other organisms, and more studies need to be conducted to understand whether this chemical has any impact on humans.



Car tire particles wash into creeks and storm drains, contaminating the water with a chemical that scientists discovered is highly toxic to coho salmon. (Mark Stone / University of Washington)

Doc 23A -275F-

Worrisome concentrations of 6PPD-quinone were also confirmed in samples from L.A. and San Francisco. Rebecca Sutton, a study co-author who specializes in emerging contaminants, had reached out to the researchers in Puget Sound after coming across a number of tire rubber chemicals in her studies of San Francisco Bay.

These discoveries fit into a growing body of science that illuminates how driving is not just an air pollution and climate change problem, she said. In a separate study last year, Sutton was surprised to find that tire particles were by far the largest source of microplastics in the bay.

Tires containing zinc have also been known to harm wildlife, said Sutton, who works for the San Francisco Estuary Institute, an independent science think tank. "We also know that steelhead trout and Chinook salmon exhibit some sensitivity to tire rubber chemicals."

CALIFORNIA

It just rained (again). Is it safe to swim in the ocean?

Dec. 27, 2019

Doc 23A -275F-

Across California, water quality regulators, state transportation officials and federal scientists have been learning about these startling connections between stormwater and coho deaths during recent meetings and conferences. The state's coastal highway, some pointed out, crosses numerous streams and estuaries.

"Now that they've gotten it nailed down to one compound — that's amazing. It's also really helpful that something could be done about it," said Joe Dillon, who specializes in water quality and toxicology for NOAA Fisheries. "This means the tire industry can work on figuring out how to replace that compound with something less toxic. It means they can be pushed by the state of California or by nongovernmental organizations to undertake that work."

Matt St. John, executive officer of California's Regional Water Quality Control Board on the north coast, home to most of the remaining coho salmon in California, said he'd like to start monitoring for this chemical in creeks to determine what further action is needed.

"The study is definitely an eyebrow-raiser," he said. "When you find a causal link like this that is controllable, we need to take this type of information seriously."

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Rosanna Xia

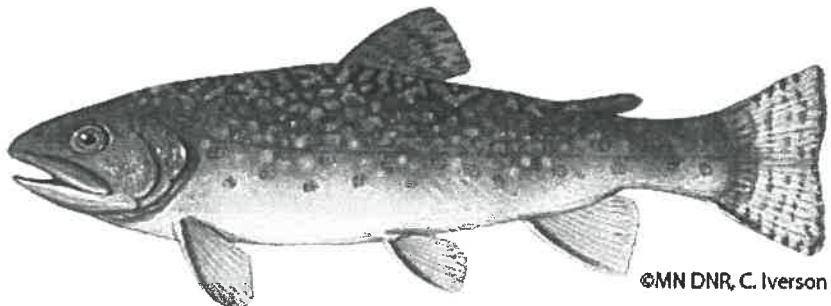
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Rosanna Xia is an environment reporter for the Los Angeles Times. She covers the coast and was a Pulitzer Prize finalist in 2020 for explanatory reporting.

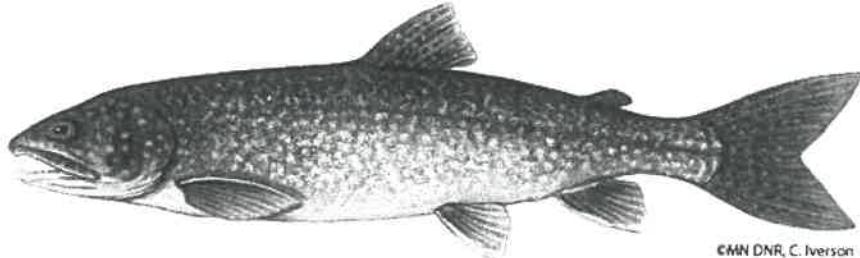
<https://www.dnr.state.mn.us/fish/trout/index.html>

Trout

Minnesota has two native trout species: the brook trout ("brookies") and the lake trout. These species belong to a group of trout known as char.



brook trout



lake trout

The other trout now in this state are brown trout and rainbow trout. Both were introduced to Minnesota in the late 1800s. The rainbow is native to western North America and the brown is native to Germany. Brown trout are the hardiest of the trout species and as a result can tolerate water warmer and less clear than rainbows and especially brook trout require.

Most trout streams are in southeastern Minnesota and along the North Shore. The southern streams have mainly browns with some rainbows and, in the cold clear headwaters, brook trout. The northern streams have mostly brook trout. Lake trout are found in Lake Superior and in many deep, cold, clean northern lakes.

A type of large rainbow trout that lives most of its life in Lake Superior and spawns in large North Shore rivers is called a steelhead. A cross between a lake trout and a brook trout, called a splake, is also found in some northern lakes.

Doc 23B-275I-



©MN DNR, C. Iverson

brown trout



©MN DNR, C. Iverson

rainbow trout

WRAPS Development

During the development of the WRAPS, three stakeholder meetings were held for technical advice and strategy prioritization: May 24, 2017; July 27, 2017; and February 26, 2018. An additional meeting concerning development of the Flute Reed River TMDL was held on July 17, 2017, in Hovland with the Flute Reed Stream Partnership.

Also, throughout the WRAPS process, the MPCA staff participated in a variety of local meetings to provide updates on the purpose and development of the LSN WRAPS document, outcomes of data collection, condition of the lakes and streams in the watershed and request feedback from interested stakeholders.

Public Notice for Comments

An opportunity for public comment on the draft WRAPS and TMDL reports were provided via a public notice in the State Register from June 18, 2018 through July 18, 2018. No comments were received.

3.3 Restoration & Protection Strategies

The LSN Watershed is unique as it contains many exceptional water resources, few impairments, and relatively low population density. As such, watershed strategies are able to focus predominantly on protection efforts, with less emphasis on restoration efforts. During the development of the WRAPS, existing watershed plans and assessments provided meaningful, local knowledge to the selection of strategies. This section provides a summary of implementation strategies and actions for both restoration and protection. During the development of the WRAPS, existing plans, assessments, and priorities were referenced and provided meaningful, local knowledge to the selection of the restoration and protection strategies, including:

- LSN 1W1P
- LSN Stressor Identification Report
- Flute Reed River TMDL
- Poplar River TMDL
- Sustaining Minnesota's Lake Superior Tributaries in a Changing Climate
- USDA Forest Adaptation Resources: Climate Change Tools and Approaches for Land Managers
- Climate Change Field Guide for Northern Minnesota Forests
- Minnesota Forest ecosystem vulnerability assessment and synthesis: a report from the Northwoods Climate Change Response Framework Project
- Cook County Coalition of Lake Associations list of priorities for the 25 by 2025 effort

There are several strategies that apply across the entire watershed; these are provided in a watershed-wide summary table. See Table 14a. In addition, many strategies apply to the near-shore Lake Superior area. These strategies are presented in Table 14b. Lastly, strategies are also summarized at a HUC10 subwatershed scale (Tables 14c-14m). In an effort to coordinate and align the WRAPS document with

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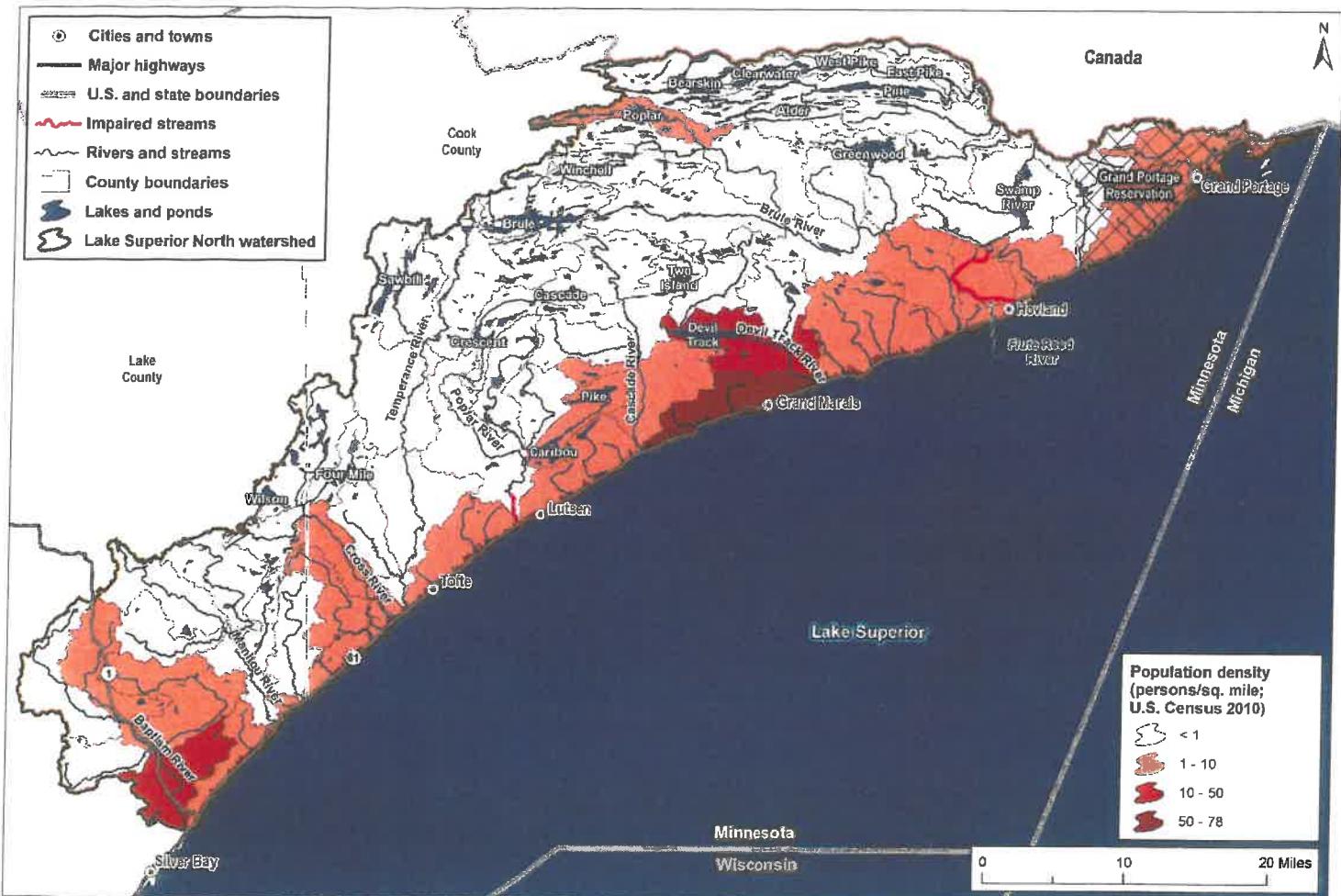


Figure 12. Population densities by HUC12.

Lake Superior - North Watershed Restoration and Protection Strategy Report AUGUST 2018

Summaries and recommendations

Water quality in the Lake Superior – North Watershed is generally good, and consistently met state standards, reflecting its lightly-developed, heavily-forested landscape. Many exceptional streams were identified and outstanding water quality was noted in a number of lakes. However, a small number of streams were identified as impaired due to high levels of suspended sediment, and, although no lake water quality impairments were identified, transparency in some lakes appears to be declining.

Approximately 40% of the streams monitored in the course of this study were found to support “exceptional” biological communities. These streams typically contain Brook Trout and other fishes that require clean, cold water, including species that are rarely found outside of the Lake Superior – North Watershed (e.g., Longnose Sucker). Lake Chub, a state-listed Species of Special Concern, was found in several streams in the far northeast corner of the watershed. The macroinvertebrate communities of these exceptional streams are typically diverse, include high densities of sensitive insects, and are particularly rich in stonefly and caddisfly genera. The larval dragonfly *Boyeria grafiana*, a state-listed Species of Special Concern, was found in 22 streams and several other rare macroinvertebrates were observed in various streams across the watershed.

Exceptional streams were found throughout the Lake Superior – North Watershed, but were more concentrated in certain subwatersheds (e.g., the Devil Track River and Temperance River subwatersheds). The lowest proportions of exceptional streams were found in the two subwatersheds that include aquatic life use impairments due to high levels of suspended sediment (Poplar River subwatershed, Flute Reed River subwatershed).

Essentially all of the Lake Superior – North’s exceptional streams drain minimally-developed, lightly-disturbed catchments. However, a few may be threatened by ongoing and future land use. For example, the catchment of Irish Creek contains a significant proportion of private land and is adjacent to an area that has experienced relatively rapid development in recent decades. Similarly, the Little Devil Track River drains the outskirts of the watershed’s largest developed area (Grand Marais), and the river’s lower reaches are completely surrounded by private land. Poor land use practices in developing areas may contribute to water quality degradation, and should be an ongoing concern in the Lake Superior – North Watershed.

Shoreland protection is an important means for maintaining water quality in lakes. Although no lake water quality impairments were identified in the Lake Superior – North Watershed, transparency appears to be declining on four lakes (Poplar, Deer Yard, Devil Track, Tom). The causes of these declines are uncertain, but it’s notable that each of these lakes’ shorelines ranks among the most-developed in the watershed. Efforts are underway to identify and address potential threats to lake water quality (i.e., non-compliant septic systems) on some of these lakes.

A multi-agency effort has recently been undertaken to systematically identify and prioritize watershed protection opportunities in Minnesota. The purpose of this approach is to provide state agencies and their partners with a consistent method and rationale for how to identify water bodies at risk, set reasonable goals for protection, incorporate locally held water quality values and considerations, and provide recommendations for specific protection methods. In this process, lake monitoring data is subjected to a multi-step analysis that forms a preliminary ranking of protection priorities. A combination of factors are reviewed to determine priority ranking. Among these factors are a lake’s sensitivity to an increase in phosphorus, a documented decline in water quality or monitored phosphorus concentrations close to the water quality standard, and the percentage of developed land use in the area. In the Lake Superior – North Watershed, highest protection priority is suggested for six

Data management

It is MPCA policy to use all credible and relevant monitoring data to assess surface waters. The MPCA relies on data it collects along with data from other sources, such as sister agencies, local governments and volunteers. The data must meet rigorous quality assurance protocols before being used. All monitoring data required or paid for by MPCA are entered into MPCA's data system (Environmental Quality Information System, or EQulS), and are also uploaded to the U.S. Environmental Protection Agency's (EPA) data warehouse. Data from federal- or state-funded monitoring projects are required to be stored in EQulS (e.g., Clean Water Partnership, CWLA Surface Water Assessment Grants and TMDL program). Many local projects not funded by MPCA also choose to submit their data to the MPCA in an EQulS-ready format so that monitoring data may be utilized in the assessment process. Prior to each assessment cycle, the MPCA makes a formal request for monitoring data to local entities and partner organizations.

Period of record

The MPCA uses data collected over the most recent 10-year period for all water quality assessments. This timeframe provides a reasonable assurance that data will have been collected over a range of weather and flow conditions and that all seasons will be adequately represented; however, data from the entire period is not required to make an assessment. The goal is to use data that best represents current water quality conditions. During the assessment process, more weight may be placed on recent data for pollutant categories such as toxics, lake eutrophication and fish contaminants.

Watershed overview

The Lake Superior – North 8-HUC drains 2,240 mi², of which approximately 30% lies in Canada (Figure 7). The United States' portion of the watershed includes approximately 1,570 mi² of Lake and Cook counties, and contains both the highest and lowest elevations found in the state of Minnesota (Eagle Mountain at 2301 feet; Lake Superior at 600 feet). All of the watershed's streams and rivers drain to Lake Superior, but there is no single "pour point" for the entire 8-HUC.

Most Lake Superior – North streams originate in upland bogs, marshes, and lakes, flow slowly through rugged glacial deposits, and finally plunge over steep rapids and waterfalls a short distance before meeting Lake Superior. Pigeon River is the largest tributary (draining 610 mi²), and forms the international border along its entire length; less than half of the Pigeon River's catchment lies in the United States. Brule River is the 8-HUCs largest catchment entirely within the United States, draining 265 mi². Other sizeable Lake Superior tributaries include Temperance River, Baptism River, Poplar River, and Cascade River. The watershed is lake-rich, including more than 600 lakes, of which 578 are at least 10 acres in size. The largest lakes are Brule, Pine, Greenwood, and Devil Track (Figure 8).

The United States' portion of the watershed lies entirely within the Northern Lakes and Forest Level 3 ecoregion (Figure 9). Forest and wetland are, by far, the dominant land cover types; development and agriculture comprise a very small proportion of the watershed. Surficial geology is dominated by moraine and other glacial features, though peat is common in some areas, glacial lake deposits (sands and clays) are present in the far northeast region of the watershed, and ancient lava flows are exposed in some places, particularly along the Lake Superior shoreline.

The vast majority (81%) of the United States' portion of the watershed is under federal, state, county, or municipal administration. Approximately 14% of the watershed is in private, non-tribal ownership, and lands of the Grand Portage Band of Lake Superior Chippewa comprise approximately 5% of the watershed (Figure 10). Nearly 18% of the watershed lies within federally-protected wilderness, and

One of the principal concerns identified by County SWCDs for the Lake Superior North – Watershed is groundwater protection, for both quality and quantity. Groundwater withdrawals have increased nearly 30% over the last 20 years, partly due to the rising demand for water supply for private consumption and recreational water related needs. It is estimated that the development pressure is moderate in some parts of the watershed where land is converted from timberland, resorts and lakeshore into home and recreation development (USDA-NRCS). This increase in recreational development can be seen with a significant increase ($p=0.001$) from 1994 to 2013 in non-crop irrigation for golf courses and special categories. At this time, aquifer drawdown is now a concern; however, if water usage and land use conversion continue to increase, the probability of the water table being drawn downwards also increases. It is for this reason that the MNDNR monitors and takes precautions when permitting water use appropriations.

Groundwater quality is based on the sensitivity of the aquifers and the effects of naturally occurring and anthropogenic influences for constituents found in the water. Special consideration should be practiced in areas of high groundwater contamination susceptibility, which are sparsely located throughout the watershed. Overall, the groundwater quality of the watershed appears to be healthy, despite some exceedances of constituents, including arsenic. However, the primary source of contamination for this watershed is geology. Additional and continued monitoring will increase the understanding of the health of the watershed and its groundwater resources and aid in identifying the extent of the issues present and risk associated. Increased localized monitoring efforts will help accurately define the risks and extent of any issues within the watershed. Adoption of BMPs will benefit both surface and groundwater.

While land management, riparian and shoreland development, and road-stream intersections may represent acute threats to aquatic health in the Lake Superior – North Watershed, longer-term and more nebulous threats may be posed by climate change, and the interaction of climate change with other stressors. Many of the watershed's streams support sensitive, stenothermic organisms that depend on perennial, coldwater streams carrying low concentrations of sediment and nutrients. These habitat and water quality conditions are the result of interacting factors of climate, hydrogeology, and land cover, and may be degraded by changes in any of these factors. Predictive models incorporating climate and land use changes suggest that aquatic resources of the Lake Superior – North Watershed are likely to experience higher temperatures, reduced dissolved oxygen, increased erosion, and other associated stress in the near future (Johnson et al. 2013, Herb et al. 2014). These changes are likely to have negative effects on the health of aquatic systems, though planning and BMP implementation may mitigate some impacts. For example, understanding the importance of small, cold tributaries to the ecological integrity of larger river systems may be of critical importance in protection planning efforts. Tributaries often spawning and nursery habitat for trout and other fishes, and may serve as critical refugia for fish and other aquatic organisms during periods of thermal stress. A watershed-based focus that recognizes the connection between landscapes, riverscapes, and the condition of aquatic resources will be essential to protection and restoration efforts.

In general, aquatic habitats in the Lake Superior – North Watershed are in very good condition; streams, lakes, and wetlands rank among the highest quality in the state, and some represent near-reference quality examples at a national scale. Stream biological monitoring surveys suggest that sensitive indicator taxa are widespread and abundant, and several rare species of fish and macroinvertebrates were observed. Many streams were designated as exceptional aquatic resources, which should provide a higher level of protection from degradation. From a protection and restoration standpoint, the watershed possesses several favorable characteristics. A relatively high proportion of its lands are already under some form of protective management (e.g., state parks, federal wilderness designation, AMAs), and much of the remainder is administered by public agencies charged with incorporating water quality considerations in their management and planning efforts. The watershed's aquatic resources are

Executive Summary

The state of Minnesota has adopted a watershed approach to address the state's 80 major watersheds (denoted by 8-digit hydrologic unit code or HUC). This watershed approach incorporates water quality assessment, watershed analysis, civic engagement, planning, implementation, and measurement of results into a 10-year cycle that addresses both restoration and protection as part of a Watershed Restoration and Protection Strategy (WRAPS) report. This WRAPS report addresses a portion of the waterbodies within the Lake Superior North (LSN) Watershed (HUC 04010101), located in the most northeastern portion of Minnesota along Lake Superior. Lake Superior's shoreline forms the eastern border of the LSN Watershed. The watershed constitutes 1,570 square miles and lies within the Northern Lakes and Forest ecoregion. The dominant land cover is forest and wetland, and the majority of the watershed is undeveloped.

Water quality in the LSN Watershed is exceptionally high. The Minnesota Pollution Control Agency (MPCA) assessed lakes and streams in the watershed to identify impaired waters and waters in need of protection. Of these, two streams and no lakes were identified as impaired for aquatic life use, demonstrating the high overall water quality in the watershed. The Poplar River was previously identified as impaired due to high levels of sediment, but was recently recommended for delisting in the 2018 draft impairment list. This success is a testament to restoration efforts that have taken place in the watershed. The Flute Reed River was also identified as impaired due to high levels of sediment and requires restoration efforts. The remaining unimpaired streams and lakes are identified for protection efforts.

Restoration and protection strategies for implementation aim to preserve and enhance water quality in unimpaired streams and lakes and improve water quality in the Flute Reed River. Protection efforts in the LSN Watershed are of the highest importance, and, to that end, a series of indicators are provided to inform implementation activities and focus initial efforts on at-risk waters and those that are of exceptional quality. Indicators are provided that represent potential human-caused risk, geomorphology, and biology. These indicators, along with the results of a statewide prioritization of lakes, including lakes in the watershed, were used to select appropriate protection strategies. Restoration and protection strategies include: reducing industrial/municipal wastewater discharges, nutrient management/ addressing subsurface septic systems, fisheries management (streams), increasing stream connectivity, streambank stabilization and riparian management, lake management and shoreland stabilization, invasive species control, land use planning and ordinances, stormwater management, forest management, education and outreach activities, wetland management, groundwater/drinking water management, and aggregate mining management.

During the timeframe of the WRAPS effort, the Lake Superior North One Watershed One Plan (1W1P) local water management planning process was initiated as a pilot project, and was completed prior to the final WRAPS components being available for incorporation into the 1W1P plan. Findings of the final WRAPS study, which may improve the targeted, prioritized and measured goals of the 1W1P plan will be reviewed at the 1W1P five year update interval. WRAPS deliverables, which may benefit the 1W1P include: a detailed review of stressors in the one impaired watershed in need of a TMDL, the Flute Reed River, and a companion detailed report, stressor reviews for waters in need of protection and a

*Lake Superior - North Watershed
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Restoration and Protection Strategy Report 8/18*

Summaries and recommendations

Water quality in the Lake Superior – North Watershed is generally good, and consistently met state standards, reflecting its lightly-developed, heavily-forested landscape. Many exceptional streams were identified and outstanding water quality was noted in a number of lakes. However, a small number of streams were identified as impaired due to high levels of suspended sediment, and, although no lake water quality impairments were identified, transparency in some lakes appears to be declining.

Approximately 40% of the streams monitored in the course of this study were found to support “exceptional” biological communities. These streams typically contain Brook Trout and other fishes that require clean, cold water, including species that are rarely found outside of the Lake Superior – North Watershed (e.g., Longnose Sucker). Lake Chub, a state-listed Species of Special Concern, was found in several streams in the far northeast corner of the watershed. The macroinvertebrate communities of these exceptional streams are typically diverse, include high densities of sensitive insects, and are particularly rich in stonefly and caddisfly genera. The larval dragonfly *Boyeria grafiana*, a state-listed Species of Special Concern, was found in 22 streams and several other rare macroinvertebrates were observed in various streams across the watershed.

Exceptional streams were found throughout the Lake Superior – North Watershed, but were more concentrated in certain subwatersheds (e.g., the Devil Track River and Temperance River subwatersheds). The lowest proportions of exceptional streams were found in the two subwatersheds that include aquatic life use impairments due to high levels of suspended sediment (Poplar River subwatershed, Flute Reed River subwatershed).

Essentially all of the Lake Superior – North’s exceptional streams drain minimally-developed, lightly-disturbed catchments. However, a few may be threatened by ongoing and future land use. For example, the catchment of Irish Creek contains a significant proportion of private land and is adjacent to an area that has experienced relatively rapid development in recent decades. Similarly, the Little Devil Track River drains the outskirts of the watershed’s largest developed area (Grand Marais), and the river’s lower reaches are completely surrounded by private land. Poor land use practices in developing areas may contribute to water quality degradation, and should be an ongoing concern in the Lake Superior – North Watershed.

Shoreland protection is an important means for maintaining water quality in lakes. Although no lake water quality impairments were identified in the Lake Superior – North Watershed, transparency appears to be declining on four lakes (Poplar, Deer Yard, Devil Track, Tom). The causes of these declines are uncertain, but it’s notable that each of these lakes’ shorelines ranks among the most-developed in the watershed. Efforts are underway to identify and address potential threats to lake water quality (i.e., non-compliant septic systems) on some of these lakes.

A multi-agency effort has recently been undertaken to systematically identify and prioritize watershed protection opportunities in Minnesota. The purpose of this approach is to provide state agencies and their partners with a consistent method and rationale for how to identify water bodies at risk, set reasonable goals for protection, incorporate locally held water quality values and considerations, and provide recommendations for specific protection methods. In this process, lake monitoring data is subjected to a multi-step analysis that forms a preliminary ranking of protection priorities. A combination of factors are reviewed to determine priority ranking. Among these factors are a lake’s sensitivity to an increase in phosphorus, a documented decline in water quality or monitored phosphorus concentrations close to the water quality standard, and the percentage of developed land use in the area. In the Lake Superior – North Watershed, highest protection priority is suggested for six

Lake Name	Lake ID	Lake Type	Secchi Depth (m) ^a	Average Total Phosphorus (µg/L) ^a	P Sensitivity Score ^a	% Disturbed ^a	Lake Association ^b	HUC 10
Superior				Not assessed as part of statewide prioritization effort				Multiple

LT: lake trout lake (DNR 2017). T: designated trout lake (DNR 2017)

a: Number from statewide prioritization effort

b: Lake Association list provided by CCCoLA members

c: Lake Trout are still present but in low numbers (DNR correspondence)

d: Average total phosphorus is nearing the standard for designated trout lakes (20 µg/L)

Streams Identified for Protection

As noted in Section 2.1, most streams meet water quality standards and, in many cases, are significantly better than the standards. Although all rivers and streams require some level of protection, select streams within the LSN Watershed were identified as potential at-risk waters, or unique and high value waters. These streams are identified based on their index of biotic integrity (IBI) scores paired with the stream's TALU designation that assigns biological goals to a stream. The current TALU process defines three potential categories: exceptional use, general use and modified use. Once the highest use for a stream has been established, it should remain at that use. Two TALU designations for streams exist in the LSN Watershed – general and exceptional use. Exceptional use streams are those that support biological communities at or near natural conditions. General use streams support good or healthy aquatic communities (MPCA 2015).

Figure 23 and Figure 24 summarize the IBI data and TALU designations. Biological monitoring sites on exceptional use streams are indicated with a star. The blue markers (“> upper confidence limit”) indicate streams that are comfortably meeting IBI targets for their use (general or exceptional). The green and purple markers (“> or < threshold”) indicate streams with IBI scores that are close to the targets and are considered threatened of becoming impaired. No streams were below the lower confidence limits for either use. The streams that are near the expected target score for either fish or macroinvertebrate IBI (green and purple markers) are unimpaired, but at risk of becoming so. These streams are considered for protection because they are potentially vulnerable to impairment in the future. It is possible that some of the lower scoring monitoring sites are due to poor monitoring site selection, physical barriers downstream, or application of a target that is not reflective of the stream condition. Using this review process, the streams identified as potentially threatened based on fish and macroinvertebrate IBI data include:

- Baptism River
- East Branch Baptism
- West Branch Baptism
- Hockamin Creek
- Manitou River
- South Branch Manitou River
- Houghtaling Creek
- Two Island River
- Cross River
- Wilson Creek
- Six Mile Creek
- Temperance River

Tiered aquatic life uses (TALU) framework

RULEMAKING UPDATE: The U.S. Environmental Protection Agency (EPA) approved Revisions to Minnesota's Water Quality Standards: Tiered Aquatic Life Uses and Biological Criteria (Minn. R. ch. 7050 and 7052) on June 26, 2018.



Minnesota has adopted changes to its water quality standards (Minn. Rule Chapters 7050 and 7052) that establish a tiered aquatic life uses (TALU) framework for rivers and streams. These rule amendments affect Class 2 (Aquatic Life) standards. The EPA approved the TALU framework rule on June 26, 2018.

The adopted TALU framework is a significant revision to the aquatic life use classification in the state's water quality standards. It built upon existing water quality standards to improve how water quality in streams and rivers are monitored and managed. Additionally, these changes advance the ability to identify stressors and develop effective mechanisms to improve and maintain the condition of waters in Minnesota.

The adopted TALU framework enhances the protection and maintenance of the biological, chemical and physical integrity of state water resources by achieving the following goals:

- **Establishes biological water quality standards.** This provides a more direct method to measure and protect biological health and identify water quality problems that chemical measurements alone might miss.
- **Protects high-quality water resources.** The framework provides a mechanism to identify and protect high quality water resources.
- **Provides a mechanism to appropriately and reasonably classify and assess modified water resources.** These include channelized streams and ditches.
- **Improves stressor identification.** This provides greater accuracy when assessing the stressors that impact Minnesota's water resources.

Rulemaking

The MPCA published its notice of intention to adopt proposed rule amendments to state water quality standards (Minnesota Rules, Chapters 7050 and 7052), to establish a TALU framework and modify Class 2 Beneficial Use Designations, in the *State Register* on December 19, 2016,

together with the proposed amendments. During the 45-day comment period, which ended at 4:30 p.m. on February 2, 2017, the MPCA received more than 25 valid requests for a public hearing to be held on the proposed amendments.

The MPCA held a public hearing on Thursday, Feb. 16, 2017, in the MPCA St. Paul office, which was video-conferenced to regional offices in Duluth, Detroit Lakes and Marshall. Administrative Law Judge James R. Mortenson conducted the hearing. Following the hearing, a post-hearing comment and rebuttal comment period were held, during which additional written comments on the proposed amendments were submitted to the Office of Administrative Hearings (OAH). With the conclusion of the rebuttal comment period on March 24, 2017, the hearing record closed.

On April 24, 2017, Judge Mortenson issued his report. Within it, he concluded, in part, that: (a) the MPCA complied with the legal administrative rulemaking requirements; (b) there are no negative findings or defects in the proposed rule amendments; and (c) the amendments are necessary and reasonable. He also recommended that the proposed amendments be adopted. The judge's report is available below in the Procedural Rulemaking Documents section. Also available at this location are the exhibits introduced into the public hearing record and the comments submitted to the OAH during the post-hearing and rebuttal comment periods.

The MPCA adopted the rule amendments on September 21, 2017 (see Order Adopting in the Procedural Rulemaking Documents section below) and published its Notice of Adoption in the *State Register* on October 16, 2017. The rule amendments become effective five working days after the notice is published (October 23, 2017).

2.1 [For text of items EE to HH, see M.R.]

2.2 [For text of subps 4 to 10, see M.R.]

2.3 **7050.0250 ANTIDEGRADATION PURPOSE.**

2.4 The purpose of the antidegradation provisions in parts 7050.0250 to 7050.0335 is
2.5 to achieve and maintain the highest possible quality in surface waters of the state. To
2.6 accomplish this purpose:

2.7 A. existing uses and the level of water quality necessary to protect existing uses
2.8 shall be maintained and protected;

2.9 B. degradation of high water quality shall be minimized and allowed only to the
2.10 extent necessary to accommodate important economic or social development;

2.11 C. water quality necessary to preserve the exceptional characteristics of
2.12 outstanding resource value waters shall be maintained and protected; and

2.13 D. proposed activities with the potential for water quality impairments
2.14 associated with thermal discharges shall be consistent with section 316 of the Clean Water
2.15 Act, United States Code, title 33, section 1326.

2.16 **7050.0255 DEFINITIONS.**

2.17 Subpart 1. **Applicability.** For purposes of parts 7050.0250 to 7050.0335, the
2.18 following terms have the meanings given in this part. Terms in parts 7050.0250 to
2.19 7050.0335 that are not specifically defined in applicable federal or state law shall be
2.20 construed in conformance with the context, in relation to the applicable section of the
2.21 statutes pertaining to the matter and current professional usage as of the effective date of
2.22 this part.

2.23 Subp. 2. **Agency.** "Agency" has the meaning given under Minnesota Statutes,
2.24 section 115.01, subdivision 2, unless otherwise specified.

2.25 Subp. 3. **Applicant.** "Applicant" means a person requesting a control document.

The effect of roads on peak flows is relatively modest (see "Hydrologic Effects," above), and the issues of changing stability and predictability because of roads may be of little importance to aquatic habitat suitability.

Road-stream crossings have effects on stream invertebrates. Hawkins and others (in press) found that the aquatic invertebrate species assemblages (observed versus expected, based on reference sites) were related to the number of stream crossings above a site. Total taxa richness of aquatic insect larvae (mayflies, Ephemeroptera; stoneflies, Plecoptera; and caddisflies, Trichoptera) were negatively related to the number of stream crossings. Another study (Newbold and others 1980) found significant differences between macroinvertebrate assemblages above and below road-stream crossings.

Several studies at broad scales document aquatic habitat or fish density changes associated with road density or indices of road density. Eaglin and Hubert (1993) show a positive correlation with numbers of culverts and stream crossings and amount of fine sediment in stream channels, and a negative correlation with fish density and numbers of culverts in the Medicine Bow National Forest. Macroinvertebrate diversity negatively correlates with an index of road density (McGurk and Fong 1995). Increasing road densities are associated with decreased likelihood of spawning and rearing of non-anadromous salmonids in the upper Columbia River basin, and populations are negatively correlated with road density (Lee and others 1997).

Reliability, confidence, and limitations—Research evidence of increased erosion and sediment delivery to streams resulting from roads is strong. Subsequent habitat changes from such processes as pool filling and cobble embeddedness are well documented, but these effects depend heavily on channel geometry, flow regimes, and so on. Thus, they range widely in time and space. Measured changes in stream temperature after canopy removal are strong but biological response is highly variable, and existing literature speculates on possible mechanisms. Empirical evidence relating road density to habitat and population response at landscape scales is fairly new. The study by Lee and others (1997) has a large database and is analytically sound, but it demonstrates a statistically valid population response only for non-anadromous salmonids. Because roads are not distributed randomly on the landscape, these studies can be confounded by other landscape variables that may control biological response. This issue is addressed by Lee and others (1997).

Generalizability—Broad-scale patterns in the distribution of roads and fish suggests that the effects of roads are common and widespread across a range of environments and conditions (Bettinger and others 1998, Lee and others 1997). Changes in aquatic habitat resulting from increased erosion and sediment delivery are highly controlled by lithology and slope, however. Road-derived sediment in granitic terrain typically results in an increase in the proportion of fine bedload. In fine-textured parent materials, suspended load may increase but not change pool filling and cobble embeddedness. Changed timing and size of peak and low flows resulting from roads have different implications for storm-generated and snowmelt-dominated hydrologic regimes, and they result in different biological effects for oversummer and overwinter egg survival. The effect of cover removal on elevated stream temperature depends on the rate of vegetation recovery and appears to be brief in the Eastern United States (Swift 1983).

Secondary links—Responses by aquatic habitat depend on geomorphic and sediment changes associated with roads. Road-associated changes in nutrients and hazardous chemical spills are also linked but are issues addressed elsewhere in this report.

Landscape-Scale Effects on Fish

Conclusions—Road effects on aquatic habitat and population response are well documented and overwhelmingly negative, but results differ among sites. Measures of the cumulative effects of roads that are closely related to mechanism (for example, the length of roads connected by direct surface-flow paths to streams or the miles of potential habitat blocked by culverts) would be more likely to produce stronger relations between roads and aquatic habitat elements than would road density.

Issues—The decline of anadromous fish in many parts of the country, especially the salmonids in the West, has led to much research on the diverse causes. Among those, the relation of roads to intensity of land use and adverse effects on aquatic habitats has been discussed in several recent studies and publications (Meehan 1991, Naiman and others 1992, Spence and others 1996). The discussion centers on three themes: the correlation of road density to fish habitat and fish populations is not strong; the legacy of past road building is so vast and budgets for maintaining roads so low that the problems will be with us for a long time; and road building practices have improved in the last decade to the point where we need not worry about the effects of roads on aquatic systems. The scientific assessment for the interior Columbia basin provided an opportunity to examine these issues at a broad, landscape scale in this ecoregion.

Findings—Roads contribute more sediment to streams than does any other land management activity (Gibbons and Salo 1973, Meehan 1991), but most land management activities, such as mining, timber harvest, grazing, recreation, and water diversions, depend on roads. Most of the sediment from timber harvest activities is related to roads and road building (Chamberlain and others 1991, Dunne and Leopold 1978, Furniss and others 1991, MacDonald and Ritland 1989, Megahan and others 1978) and the associated increases in erosion rates (Beschta 1978, Gardner 1979, Meehan 1991, Rhodes and others 1994, Reid 1993, Reid and Dunne 1984, Swanson and Dyrness 1975, Swanson and Swanson 1976). Serious degradation of fish habitat can result from poorly planned, designed, located, built, or maintained roads (Furniss and others 1991, MacDonald and others 1991, Rhodes and others 1994). Roads also can affect water quality through applied road chemicals and toxic spills (Furniss and others 1991, Rhodes and others 1994), and the likelihood of toxic spills reaching streams has increased with the many roads paralleling them.

Roads directly affect natural sediment and hydrologic regimes by altering streamflow, sediment loading, sediment transport and deposition, channel morphology, channel stability, substrate composition, stream temperatures, water quality, and riparian conditions in a watershed. For example, interruption of hillslope drainage patterns alters the timing and magnitude of peak flows and changes base stream discharge (Furniss and others 1991, Harr and others 1975) and subsurface flows (Furniss and others 1991, Megahan 1972). Road-related mass soil movements can continue for decades after roads have been built (Furniss and others 1991). Such habitat alterations can adversely affect all life stages of fish, including migration, spawning, incubation, emergence, and rearing (Furniss and others 1991, Henjum and others 1994, MacDonald and others 1991, Rhodes and others 1994).

Poor road location, concentration of surface and subsurface water by cross-slope roads, inadequate road maintenance, undersized culverts, and sidecast materials all can lead to road-related mass movements (Lyons and Beschta 1983, Swanson 1971, Swanson and Swanson 1976, Wolfe 1982). Sediment production from logging roads in the Idaho batholith was 770 times higher than in undisturbed areas; about 71 percent of the increased sediment production was due to mass erosion (Megahan and Kidd 1972), leaving 29 percent due to surface erosion.

One of the principal concerns identified by County SWCDs for the Lake Superior North – Watershed is groundwater protection, for both quality and quantity. Groundwater withdrawals have increased nearly 30% over the last 20 years, partly due to the rising demand for water supply for private consumption and recreational water related needs. It is estimated that the development pressure is moderate in some parts of the watershed where land is converted from timberland, resorts and lakeshore into home and recreation development (USDA-NRCS). This increase in recreational development can be seen with a significant increase ($p=0.001$) from 1994 to 2013 in non-crop irrigation for golf courses and special categories. At this time, aquifer drawdown is now a concern; however, if water usage and land use conversion continue to increase, the probability of the water table being drawn downwards also increases. It is for this reason that the MNDNR monitors and takes precautions when permitting water use appropriations.

Groundwater quality is based on the sensitivity of the aquifers and the effects of naturally occurring and anthropogenic influences for constituents found in the water. Special consideration should be practiced in areas of high groundwater contamination susceptibility, which are sparsely located throughout the watershed. Overall, the groundwater quality of the watershed appears to be healthy, despite some exceedances of constituents, including arsenic. However, the primary source of contamination for this watershed is geology. Additional and continued monitoring will increase the understanding of the health of the watershed and its groundwater resources and aid in identifying the extent of the issues present and risk associated. Increased localized monitoring efforts will help accurately define the risks and extent of any issues within the watershed. Adoption of BMPs will benefit both surface and groundwater.

While land management, riparian and shoreland development, and road-stream intersections may represent acute threats to aquatic health in the Lake Superior – North Watershed, longer-term and more nebulous threats may be posed by climate change, and the interaction of climate change with other stressors. Many of the watershed's streams support sensitive, stenothermic organisms that depend on perennial, coldwater streams carrying low concentrations of sediment and nutrients. These habitat and water quality conditions are the result of interacting factors of climate, hydrogeology, and land cover, and may be degraded by changes in any of these factors. Predictive models incorporating climate and land use changes suggest that aquatic resources of the Lake Superior – North Watershed are likely to experience higher temperatures, reduced dissolved oxygen, increased erosion, and other associated stress in the near future (Johnson et al. 2013, Herb et al. 2014). These changes are likely to have negative effects on the health of aquatic systems, though planning and BMP implementation may mitigate some impacts. For example, understanding the importance of small, cold tributaries to the ecological integrity of larger river systems may be of critical importance in protection planning efforts. Tributaries often spawning and nursery habitat for trout and other fishes, and may serve as critical refugia for fish and other aquatic organisms during periods of thermal stress. A watershed-based focus that recognizes the connection between landscapes, riverscapes, and the condition of aquatic resources will be essential to protection and restoration efforts.

In general, aquatic habitats in the Lake Superior – North Watershed are in very good condition; streams, lakes, and wetlands rank among the highest-quality in the state, and some represent near-reference quality examples at a national scale. Stream biological monitoring surveys suggest that sensitive indicator taxa are widespread and abundant, and several rare species of fish and macroinvertebrates were observed. Many streams were designated as exceptional aquatic resources, which should provide a higher level of protection from degradation. From a protection and restoration standpoint, the watershed possesses several favorable characteristics. A relatively high proportion of its lands are already under some form of protective management (e.g., state parks, federal wilderness designation, AMAs), and much of the remainder is administered by public agencies charged with incorporating water quality considerations in their management and planning efforts. The watershed's aquatic resources are

lakes: Tom, Devil Track, Hungry Jack, Poplar, Birch, and Deer Yard (Appendix 9). As mentioned above, all these lakes are currently meeting water quality standards.

Portions of the Lake Superior – North Watershed experienced rapid residential development in the 1990s. For example, the population of Cook County, which lies nearly entirely within the watershed, grew by 33% between 1990 and 2000. Although population growth has slowed in recent years, the Arrowhead Region remains an attractive destination for many people, and development is unlikely to decrease in the future. Protection strategies might employ development projections to identify the likely locations of future growth, and compare these regions with the occurrence of high-quality or at-risk aquatic resources. In situations where ongoing or future development is likely to occur in close proximity to high priority aquatic resources, protection strategies could be developed to encourage development design and related BMPs that promote good water quality and aquatic habitat.

More than 90% of lands in the Lake Superior – North Watershed are publicly-owned. While the catchments of some Lake Superior - North streams include significant proportions of protected lands, many streams drain landscapes that are largely managed for “general forestry”, and logging is often the most obvious form of disturbance on these lands. Well-managed forests provide both economic and ecological benefits, and timber harvest should not be condemned as a wholesale detriment to water quality. However, in some cases, logging and associated development (e.g., roads, culverts) may contribute to degradation of water quality and aquatic habitat via loss of riparian shading, food web alteration, and increased sedimentation. Site-level forest management guidelines (MFRC2013) designed to mitigate impacts to water quality are an important starting point for protecting high-quality streams. It is possible that additional BMPs or management strategies may be needed to protect some high quality and sensitive aquatic resources. At a broader scale, regional collaboratives are making an effort to manage forests in a way that promotes forest health and resiliency, and at the same time protects water quality (e.g., North Shore Forest Collaborative, The Nature Conservancy).

Other localized land-use activities may contribute stress to aquatic resources in certain circumstances. For example, aggregate mining (i.e., “gravel pits”) may alter local groundwater and surface-water levels, interrupt groundwater conduit flow paths, and broadly impact thermal conditions. Portions of several streams in the Lake Superior – North Watershed (e.g., Caribou Creek, Cascade River, Ninemile Creek, Two Island River) flow closely adjacent to aggregate mining sites; some of these streams meet exceptional use biocriteria. While disturbances from aggregate mining typically are relatively small in scale, protection strategies should consider the location and proximity of aggregate mining sites relative to aquatic resources, and recommend that water quality be a consideration in their operation and potential expansion.

The Lake Superior – North Watershed’s extensive network of paved and gravel roads intersects rivers and streams at more than 300 locations, and many more crossings occur at intersections between streams and non-road features such as trails and railroads. Road crossings may directly contribute sediment, contaminants, and warm water to streams as precipitation flows across and off of road surfaces. Improperly sized or positioned culverts may affect hydrology and stream geomorphology, causing scouring and aggradation which negatively affect in-stream habitat. Stream crossings may also inhibit ecological connectivity within stream networks, in the form of reduced movement of water, energy, material, and organisms (Forman and Alexander 1998, Freeman et al. 2007). Several streams in the Lake Superior – North Watershed have crossings that may be potential impediments to connectivity or could be causing habitat degradation. Potentially problematic road crossings were observed on Assinika Creek, Fredenberg Creek, Hockamin Creek, Woods Creek, Wanless Creek, Manitou River, and Spruce Creek. Other road crossings in need of repair or redesign surely exist within the watershed; identifying and prioritizing the rehabilitation of problematic road-stream intersections should be an important component of protection strategies for the Lake Superior – North Watershed.

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300.**

(#s 291-299 are omitted)

width and area), vegetation type, k factor, impairment designation (impaired or not), hillslope position, geomorphic association, shoulder material, road supply and stream order. Determining traffic intensity was difficult as individual field visits were short for each site; therefore traffic intensity was given a binary indicator of "0" if roads were closed and vegetated or "1" if roads were operational. Significance for all comparisons was determined by $p>0.05$. The results of predictive modeling indicate that traffic, soil K-factor, impairment status, and hillslope position were the best predictors of the presence of erosion though they are not statistically significant. However, the width of road shoulder material (sediment supply) and hillslope position best determined erosion volumes and are statistically significant ($p=0.009$ and 0.045, respectively).

6.3 ROAD-STREAM CROSSING IMPACT ON CHANNEL STABILITY

While roads can impact stream connectivity and have the potential to transport eroded sediments to nearby waters, road-stream crossings also have the potential to impact channel stability resulting in increased sediment supply from within the stream. To address road impacts on local stream stability, channel segments, both upstream and downstream of road crossings, were evaluated for stability.

In total seven sites, or 14 segments, were selected for analysis (*Beaverx01, Brule28, Flute Reed, Knife32, Nicado, Temp16, and Temp17*), the locations of which are illustrated in Figure 48. These locations were selected from the road survey database based on ability to be accessed and surveyed, vegetative coverage condition and bridge or culvert conditions. The sites ranged from 1st to 4th order streams and drained catchments ranging in size from 0.5 to 147.7 square miles. Land cover was similar between catchments, with forested cover ranging from 83-97%, developed land ranging from 0.1-2.2% and wetland area ranging from 0-8.1% (Table 14).

To assess channel stability, each stream segment was first channel typed using Rosgen Level I and II channel surveys. Cross sectional profiles, longitudinal profiles, bankfull elevations, W/D ratios and dominant channel material were determined from field measurements. Aerial photos accessed from the MN Geospatial Information Office (2011) and GoogleEarth™ were used to determine entrenchment ratios where cross sectional profiles did not capture floodplain widths. Aerial photos were also used to evaluate sinuosity and alterations in channel morphology. Channel alteration was assessed using photos from 1991, 2003, 2009, and 2010 (accessed online from MN Geo, 2011). Statistics were completed using the Mann-Whitney-Wilcoxon test ($p>0.05$).

Of the 14 stream segments assessed, channel types included B, C and E-type channels. Channel types at upstream to downstream locations at the investigated road-stream crossings included E → C and B → B type channels at 2 sites and B → C, C → B, and C → B at a single site each (Table 15).

Channel stability was assessed at each site using the Modified Pfankuch stability assessment. As previously described, the Modified Pfankuch stability assessment assigns a stability ranking ("Good", "Fair" or "Poor") to streams based on characteristics of the upper and lower banks as well as characteristics of the channel bottom. At three of the seven sites, the stream segment downstream of the road crossing was found to have an overall reduced stability compared to the upstream segment of stream (Table 15). For example, upstream segments of the road crossing at *Beaverx01* had "Good" stability while the downstream segment had only "Fair" stability. In contrast, stability was improved downstream of the road crossing at the *Nicado* and *Flute Reed* sites. Overall stability rankings remained "Good", or stable, at both upstream and downstream segments at *Temp16* and *Temp17*.

North Shore is limited, though strong relationships were identified between neighboring streams. It will be important to maintain existing long-term gaging stations and to strategically introduce additional stations at catchments of interest when and where funding becomes available.

Aerial imagery collected along the Brule, Temperance and Knife Rivers did allow for identification of areas where there is higher potential for in-channel erosion and where channel armoring and bedrock outcrops exert more stabilizing controls on the stream. In general, bankfull widths of streams tend to positively correlate with upstream contributing area. Such relationships were more prominent for the Knife River which has more highly erodible channel banks and more numerous bluffs. In contrast, less strong relationships were observed on the Brule and Temperance Rivers where channel armoring and bedrock channel bottoms are more common. Such assessments of other North Shore streams might highlight those rivers, or river reaches, with less channel armoring and lower overall stability.

Together, these observations of natural landscape characteristics along the North Shore suggest a high capacity of natural variables to influence the locations of sediment sources and their erosion potential. While current water quality standards require one numeric goal, it may be unlikely that all North Shore streams or stream segments can be held to equal standards. For example, stream segments that meander through lacustrine sediments, or segments located downstream from such locations, are likely to have higher potentials for turbid waters than reaches running through sandier soils or bedrock. Future efforts to enhance channel characterization to identify erosion risk will be critical to evaluate stream and segment specific impairment potentials.

A GIS based stressor tool, designed to take into consideration both natural and anthropogenic variables was used to highlight both reference areas as well as areas with high potential to impact water quality. Conditions of individual subcatchments as well as accumulated stress of a subcatchment based on upstream contributing areas were evaluated. In general, subcatchment areas with the greatest potential to impact water quality mapped to areas where the STATSGO kffact erodibility factors were high. Based on accumulated potential stress, degraded areas were highest along stream channels; higher potential stress correlated with higher stream orders. This trend was found with variables assessed independently or with each variable assessed together to assess overall SUMREL scores.

Anthropogenic stressor variables were also assessed independently of the natural variables. Population density, road density, land in cover crops and land developed were considered to evaluate the extent and magnitude of anthropogenic stress. Nearly all subcatchments outside of urbanized areas along the North Shore were identified as having reference conditions. Consequently, it was difficult to identify areas with high potential for soil erosion or sediment related stream impairments based on these variables alone. That being said, this anthropogenic assessment tool did suggest that roads are the variable having the largest potential to inflict the most widespread anthropogenic stress across the North Shore.

Based on these findings, further analyses were conducted to identify the mechanisms by which roads might impact soil erosion and sediment loading to streams. Roads were found to increase the drainage density of channel networks and efficiently convey overland flows to streams. These overland flows have the potential to carry high sediment loads to streams. Construction, maintenance and use of roads were also identified as factors influencing road and roadside erosion.

While upland erosion from roads presents one potential source of sediments to streams, in-channel erosion was also identified as a major sediment source. During field investigations, culverts and bridges at

stream-road crossing were determined to impact stream instability and bank erosion both downstream and upstream of the crossings.

To further evaluate stream stability and its relationship to GIS derived SUMREL scores along the North Shore, a field campaign was conducted in which 33 sites were assessed for Rosgen channel types, bank erosion hazard (Rosgen's BEHI assessment) and channel stability (Rosgen's Modified Pfankuch stability assessment). A range of Rosgen channel types (E, C and B-type channels) were identified with varying levels of stability and erosion hazard. There did not appear to be any correlation between channel type, stability rating, erosion hazard and accumulated SUMREL stressor scores. Although the SUMREL stressor analysis tool highlights subcatchment areas with higher likelihoods for degraded conditions, it does not appear that this scale will allow for identification of site specific erosion hazard and channel instability.

Based on field site observations and comparison with aerial photographs, it appears that better data related to the various till layers, their composition, position, and extent of contact with streams may be critical components necessary to predict or model sediment loading to Lake Superior tributary streams. Such factors, which can influence channel type, channel stability and erosion hazard, are illustrated in Figure 57. This aerial image shows the West Branch of the Beaver River and two sites that were surveyed as part of this project (BR4 and BR5). While Pfankuch stability ratings are "Fair" at both sites, the BR5 site has a "High" BEHI ranking and the BR4 site has a "Low" BEHI ranking. The BR5 site is characterized as a C4 stream with higher erosion hazard, high sinuosity, low slope, gravel bed materials and a wide floodplain. In contrast, the less erosion prone BR4 site is characterized as a B2 channel with low sinuosity, a narrow floodplain, cobble bed materials and a higher channel gradient. The B2 river reach flows through coarser glacial tills while the C4 river reach meanders through an erosion prone old lake bed dominated by fine lake clays (Figure 58). There are a number of such small lake beds mixed in with the glacial till landscape of the North Shore. In fact, three of our field survey sites were located in similar landscapes. All three exhibited low stability scores, high bank erosion potential and had lake clays exposed in scour pools and in the lower banks. This type of image analysis may prove useful for identifying other locations with high potential for bank erosion and sediment loading to streams.

A case study analysis of soil erosion from the Lower Poplar River catchment was also completed for this study. Modeling of sheet erosion from this area suggested the ski slopes on the Lower Poplar River are the largest contributors of sediment to the turbidity impaired reach though erosion from ravines was also considered a significant sediment source. Vegetation management and other BMPs (like water bars, etc.) to manage water flow on slopes are key to mitigating soil erosion from these areas. LiDAR may provide high resolution evaluation of more critical slopes and locations where BMPs might provide the greatest overall benefits. While large slumps are present along the sides of the channel, mass wasting of these features was not expected to have greatly affected turbidity levels during the study period. This was because stream stage was not predicted to have been elevated for long enough times during the study period to have carried away sediment from the toe of the slope.

Newer LiDAR terrain data was also used in this case study to identify preferential flow pathways in upland areas which channel overland flows towards streams. These areas have the potential to receive substantial volumes of erosive overland flows and reveal areas where gully and ravine erosion are likely to occur. This high resolution data is providing many opportunities for land managers to precisely evaluate site specific features for mitigation of overland flows and upland soil erosion.

width and area), vegetation type, k factor, impairment designation (impaired or not), hillslope position, geomorphic association, shoulder material, road supply and stream order. Determining traffic intensity was difficult as individual field visits were short for each site; therefore traffic intensity was given a binary indicator of "0" if roads were closed and vegetated or "1" if roads were operational. Significance for all comparisons was determined by $p>0.05$. The results of predictive modeling indicate that traffic, soil K-factor, impairment status, and hillslope position were the best predictors of the presence of erosion though they are not statistically significant. However, the width of road shoulder material (sediment supply) and hillslope position best determined erosion volumes and are statistically significant ($p=0.009$ and 0.045, respectively).

6.3 ROAD-STREAM CROSSING IMPACT ON CHANNEL STABILITY

While roads can impact stream connectivity and have the potential to transport eroded sediments to nearby waters, road-stream crossings also have the potential to impact channel stability resulting in increased sediment supply from within the stream. To address road impacts on local stream stability, channel segments, both upstream and downstream of road crossings, were evaluated for stability.

In total seven sites, or 14 segments, were selected for analysis (*Beaverx01, Brule28, Flute Reed, Knife32, Nicado, Temp16, and Temp17*), the locations of which are illustrated in Figure 48. These locations were selected from the road survey database based on ability to be accessed and surveyed, vegetative coverage condition and bridge or culvert conditions. The sites ranged from 1st to 4th order streams and drained catchments ranging in size from 0.5 to 147.7 square miles. Land cover was similar between catchments, with forested cover ranging from 83-97%, developed land ranging from 0.1-2.2% and wetland area ranging from 0-8.1% (Table 14).

To assess channel stability, each stream segment was first channel typed using Rosgen Level I and II channel surveys. Cross sectional profiles, longitudinal profiles, bankfull elevations, W/D ratios and dominant channel material were determined from field measurements. Aerial photos accessed from the MN Geospatial Information Office (2011) and GoogleEarth™ were used to determine entrenchment ratios where cross sectional profiles did not capture floodplain widths. Aerial photos were also used to evaluate sinuosity and alterations in channel morphology. Channel alteration was assessed using photos from 1991, 2003, 2009, and 2010 (accessed online from MN Geo, 2011). Statistics were completed using the Mann-Whitney-Wilcoxon test ($p>0.05$).

Of the 14 stream segments assessed, channel types included B, C and E-type channels. Channel types at upstream to downstream locations at the investigated road-stream crossings included E → C and B → B type channels at 2 sites and B → C, C → B, and C → B at a single site each (Table 15).

Channel stability was assessed at each site using the Modified Pfankuch stability assessment. As previously described, the Modified Pfankuch stability assessment assigns a stability ranking ("Good", "Fair" or "Poor") to streams based on characteristics of the upper and lower banks as well as characteristics of the channel bottom. At three of the seven sites, the stream segment downstream of the road crossing was found to have an overall reduced stability compared to the upstream segment of stream (Table 15). For example, upstream segments of the road crossing at *Beaverx01* had "Good" stability while the downstream segment had only "Fair" stability. In contrast, stability was improved downstream of the road crossing at the *Nicado* and *Flute Reed* sites. Overall stability rankings remained "Good", or stable, at both upstream and downstream segments at *Temp16* and *Temp17*.

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When road characteristics such as contributing road area and hillslope gradient were modeled using the slope-area threshold (Montgomery, 1994). Without further investigation and monitoring it is unclear if the observed roadside erosion was a short term or long term scenario.

Observed erosion losses totaled 93.27 m³ (if scaled to North Shore watershed: 92.44 m³ or 582.94 m³ (including outliers)). This value is considered a low estimate of road induced erosion when compared to sediment losses within the literature. It should be noted that a characterization of "low" is not known with certainty due to a lack of comparison data for this region. However to provide a point of context, a 1996 study by Wemple et al. (2001), calculated a net sediment loss of 13,080 m³ (37.6 m³/km) attributed to road prisms after a large precipitation event (290 mm) in the western Cascade Range, OR; losses roughly 5 times that observed in this study.

Road-Stream connectivity

Roads are a large contributor of concentrated drainage and runoff, often draining runoff to ditches or storm water drains which are designed to act as a conduit for conveying water in an efficient manner to nearby streams or waterbodies. The additive effect serves to increase road connectivity to streams, expanding the channel network (Montgomery, 1994, Booth & Jackson, 1997).

APPENDIX 1

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Recent findings related to measuring and modeling forest road erosion

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Abstract: Sediment is the greatest pollutant of forest streams. In the absence of wildfire, forest road networks are usually the main source of sediment in forest watersheds. An understanding of forest road erosion processes is important to aid in predicting sediment delivery from roads to streams. The flowpath followed by runoff is the key to understanding road erosion processes. On rutted roads, the flowpath follows ruts until a cross drain structure or change of grade is encountered, leading to considerable sediment delivery. Insloping roads to bare ditches can lead to ditch erosion, but if the ditch is graveled or vegetated, erosion is generally minimal. Outsloping a road minimizes the flow path length on the road, minimizing surface erosion, and runoff is dispersed along the hillside, minimizing delivery. If roads have low or no traffic, the road surface may become armored, reducing erosion rates by 70 to 80 percent. If there is no traffic, and a road becomes covered in vegetation, erosion may drop 99 percent, but the hydraulic conductivity of the road surface is only minimally affected. In many cases, forest buffers absorb road runoff, minimizing the delivery of road sediment to streams. Buffers are less effective in wetter climates in absorbing runoff and reducing sediment delivery. Cutslopes can erode, making sediment readily available to be transported from roads. Graveling reduces the likelihood of rut formation, generally leading to a significant decline in road erosion. Traffic, however, can reduce the effectiveness of gravel by pressing it into the subgrade, or breaking it down. Paving a road will reduce road surface erosion, but may increase erosion in road ditches and on the hillsides or channels in a buffer area. If water is delivered from road cross drains to a channel, the chances of delivering sediment increases, as does the chance of entraining additional sediment through channel erosion. Empirical (USLE and SEDMODL) and process-based (KINEROS and WEPP) models have been applied to road erosion. SEDMODL and WEPP have been specifically adopted to model road erosion, and to account for the important detachment and delivery processes. A version of WEPP is available online that is receiving widespread use in the USA and throughout the world. This tool can either analyze single segments of road between cross drains, or can analyze up to 200 segments in a single run. Areas needing to be improved in road erosion are modeling the armoring process within a storm, developing the probabilistic capabilities of WEPP for road applications, adding mass wasting to the WEPP technology and expanding the WEPP road soil database.

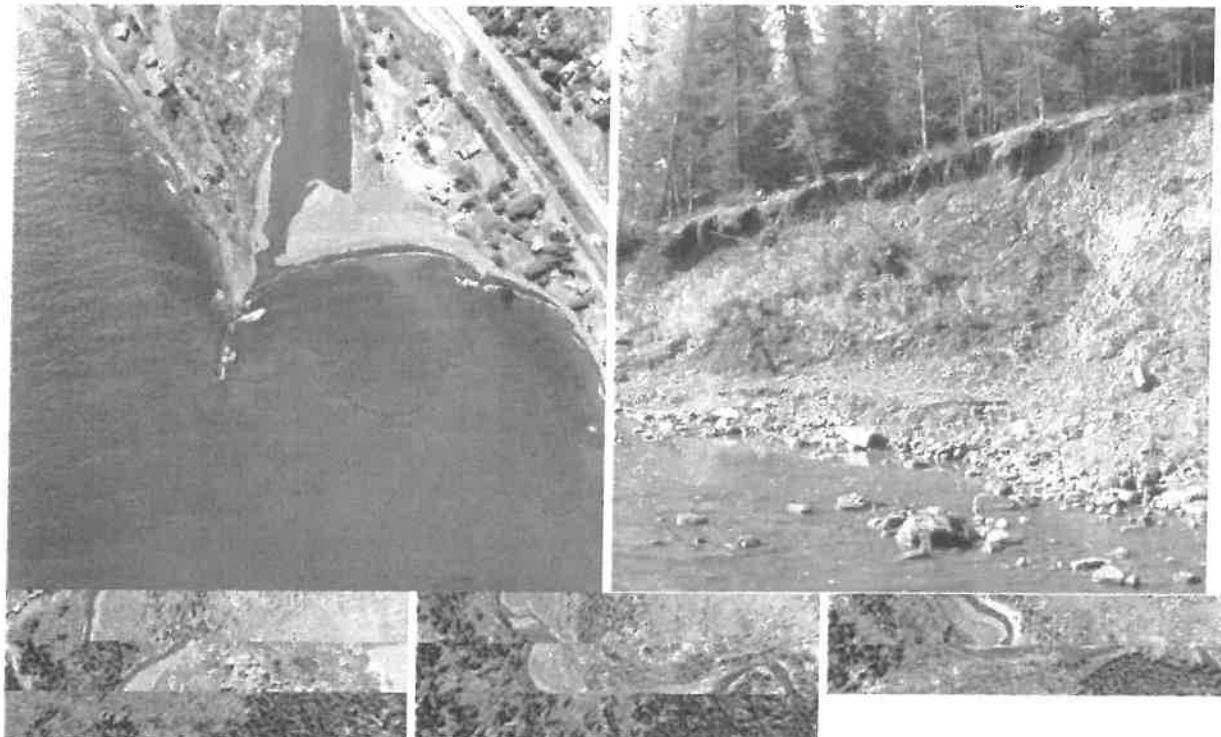
Keywords: WEPP:Road, ditch, road surface, inslope, outslope

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*See pages 301
References*



A report prepared for the Minnesota Pollution Control Agency

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Factors influencing roadside erosion and in-stream
geomorphic stability at road-stream crossings for
selected watersheds, North Shore, Minnesota, USA.

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Patricia Danielle Dutton

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University of Minnesota – Twin Cities

Co-Advisors and Committee

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Road surfaces

Road surfaces can either act as a sediment source or as a conveyance of runoff influencing erosion nearby. Erodibility of a road surface (be it unsealed/native, gravel or paved) is highly correlated to the age of the road, timing of grading and maintenance, traffic (type and timing), surficial geology and buffer vegetation density (Ramos-Scharron & MacDonald, 2007).

Unsealed roads (or native-soil roads) are known to be prime contributors of sediment, often affecting water quality (Luce & Wemple, 2001, Ramos-Scharron & MacDonald, 2007). Unpaved roads have been shown to increase surface erosion by two or more orders of magnitude compared to adjacent undisturbed hillslopes in the Virgin Islands (Ramos-Scharron & MacDonald, 2007). Sugden and Woods (2007) acknowledge unsealed roads are sediment contributors but underscore the roll of parent material and soil type as controlling factors in observed erosion rates. Sugden and Woods (2007) studied twenty ~0.05 ha unsealed native road plots in western

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Montana, finding unsealed roads yielded 0 – 96.9 Mg/ha/yr over 3 years (2002-2004). The experimental plots were tested on both fine textured glacial till and were 4 times more likely to erode than the plots on metamorphic parent material.

Generally gravel roads are considered a surface which will reduce roadside erosion when applied to unsealed roads as it acts as an “armor” protecting the native surface (Sugden & Woods, 2007). Gravel is less erosive to rain splash impact and reduces rut formation which in itself greatly reduces road erosion; increases hydraulic conductivity reducing runoff. However because gravel can also harbor fine sediments in between large coarse fragments; gravel roads can also become a fine sediment source (Sugden & Woods, 2007).

Grading

Road grading, reshapes unsealed and gravel roads. This is a necessary road maintenance procedure and an efficient way of reducing rills and ruts. If unsealed roads are not graded the road surface will “armor” or vegetate reducing

some North Shore streams, only one of those sites was field evaluated in this study. All sites and their adjective BEHI ratings are illustrated in Figure 47.

5.1.4 BANK AND BLUFF SOILS ASSESSMENT

The available soils data along the North Shore is quite generalized and the published quaternary geology mapping of the North Shore has only progressed as far as Castle Danger. Beyond Castle Danger, published maps are not accurate enough to describe local variability in geomorphic conditions that would impact erosion potential of stream channels. Furthermore, soils data is also limited to broad categories. To compare existing soils data to actual field conditions, soil samples were collected from streambanks and bluffs along North Shore streams and were analyzed in the lab by hydrometer and sieve analysis. Sites sampled had a wide range of distribution of particles sizes (Table 12). Of particular note was the high clay content of the sample taken from the Knife River bluff. This sample was collected from a location that overlaps with the broad area delineated as having predominantly red lacustrine sediments.

6.0 FIELD ASSESSMENT OF ROAD IMPACTS ON SEDIMENT SUPPLY

Although anthropogenic stress as determined by SUMREL scores was very low for most subcatchments of the North Shore, SUMREL scores were elevated in most subcatchments due to the presence and density of roads. To address the potential impact of roads on sediment delivery to Lake Superior tributaries, we examined the extent and hydrologic connectivity of roads and streams, the contribution of roadside erosion on sediment availability and the localized effects of stream-road crossings on stream channel stability. Due to the high density of roads and impervious surfaces around the City of Duluth, our analysis was directed at North Shore catchments outside of this urbanized area. The following presents a summary of the study findings (see Appendix K for the full report).

6.1 ROAD-STREAM CONNECTIVITY ANALYSIS

Within the transportation network high risk areas for increased sediment and fluvial conveyance exists for roads in close proximity to streams, especially roads draining to ditches which drain directly to streams. This is especially true for all road-stream crossings which serve as a direct connection of roads to streams (Croke et al., 2005). –Dutton, 2012.

GIS analysis of stream-road layers was conducted to examine the impact of roads on channel network extension. As with methods outlined by Miller (2010), this study quantified channel network extensions resulting from the proximity of roads to streams, in addition to the areas in which they intersect. To do this, a modified roads layer was developed which consisted of a MnDOT roads base layer and a US Forest Service (Superior National Forest) roads layer. The modified layer was overlaid with buffered stream layers (USGS NHD hydrography layer, 30m resolution) to evaluate roads within close proximity to streams. Stream buffer widths used to determine proximity were 10, 50 and 100-ft, to account for St. Louis County setback requirements (Dutton, 2012). The length of road intersecting these layers was considered an extension of the stream network and was added to existing stream lengths to evaluate changes in drainage density.

In total, 1346 stream-road intersections were identified using the GIS analysis and over 3485 miles of roads were found to be within 100ft of North Shore streams (Table 13). Together, the intersection of these features and their proximity to one another resulted in a drainage density increase of 1.5% when channels were buffered at 10ft widths and upwards of 9.5% when streams were buffered at 100ft widths.

Following MacDonald and Coe (2008) the likelihood of road related sediment conveyance to streams increases as road-stream distances decrease, less than 30 m therefore the minimum connectivity expected for study watersheds is 5.11-6.92% (30.5 m). Channel initiation processes observed in the field were incorporated into the investigation of road connectivity. On a per site level, gully processes were found to increase drainage area by 0.53-0.99%.

These values are lower than literature findings partly due to the limited observations of gully development observed in field (31% of sites, 6% of sites directly connected via gullying). It should be noted erosion observations were categorized at a smaller scale compared to the literature; with gullies categorized at depths greater than 5.1 cm (2.0 in). Comparably, Croke et al (2005) characterized channelization at depths greater than 30 cm (11.81 in), with observations less than 30 cm considered to be non-eroding or “dispersive” features. Gully lengths differed as well; average gully transport flow path was 0.73 m (2.39 ft), far less than the average gully plume length observed by Croke et al (2005) of 16 – 25 m (52.5 – 82 ft).

Although erosion characterizations were less than in other studies, it should be noted that 6% of study sites were directly connected via gullying. If this study were completed over time and monitored during and after precipitation events, this observation would surely increase. Compared to literature findings, the importance of large sample sets, and long term monitoring cannot be stressed enough, as it increases our ability to fully assess the situation at hand. For instance, a long term 30 year study at Cuttagee Creek, Australia estimated drainage density had increased by 6-10% due to gully initiation processes. Gullying accounted for 21-50% increase in drainage density at Lookout Creek and Blue River, OR Oregon (Wemple et al., 1996). Croke and Mockler (2001) found 18% of 228 drains surveyed were directly connected to streams via gully development at Cuttagee Creek; and LaMarche and Lettenmairer (2001) found 24% of 1447 sites were fully connected to streams by gully formation (characterized at the base of culverts extending to the stream) in Deschutes River, WA.

2.5. Buffer

The buffer is frequently vegetated except after wildfires. In most conditions, it is an area of high infiltration leading to deposition as the transport capacity of the overland flow is reduced. The effectiveness of the buffer is dependent on the length of road generating runoff, and the length of buffer absorbing it. The effectiveness also varies with the water content of the buffer. For large runoff events on shorter buffers, a significant amount of runoff will pass over the buffer, along with the entrained sediment. On smaller storms, sediment will be deposited near the road. Sediment plumes are frequently visible in forest buffers, but the presence of a plume from small event deposition does not necessarily imply that there was no sediment carried across the buffer from a large runoff event (e.g. Grace and Elliot, 2008). Buffers are less effective in wetter climates in absorbing runoff and reducing sediment delivery.

2.6. Ditch Erosion

Ditch erosion is dependent on the cover in the ditch, and the availability of fines. In some cases, ditches may be areas for deposition of sediment detached from the road surface, and in others, ditches may be a significant source of sediment. The erosion rates of ditches are highly dependent on the cover in the ditch (bare, vegetated, or graveled, or bare), the length of the ditch between ditch relief culverts, and the grade of the ditch.

3. MODELS

Models for road erosion can be divided into two types, empirical and process-based. The main empirical models used for road erosion in the U.S. are the Universal Soil Loss Equation (USLE, Wischmeier and Smith, 1978), and SedModl2 (Dubé and McCalmon, 2004) and related models developed for roads in the Northwestern U.S. The two process-based models that have been applied to roads are KINEROS (Woolhiser *et al.*, 1990) and the Water Erosion Prediction Project (WEPP, Flanagan and Livingston 1995). Model. The authors will briefly describe all four of these models, but will focus on the WEPP model as it is the tool with which they have been most closely associated, and which they have developed to address many of the road erosion processes.

3.1. Empirical

A series of models have been developed from data collected by numerous U.S. researchers. These data have been supplemented with additional local data in the State of Washington (Washington Forest Practices Board, 1997), and later for other areas in the NW U.S. This approach has been incorporated into the SedModl2 GIS tool, which allows users to alter the road surface erosion rate for local conditions (Dubé and McCalmon, 2004). In the SedModl2, the user defines the road surface erosion rate as a function of the geology, road surface condition, traffic level, surface area, road gradient and annual rainfall (Welsh, 2008). Cutslope erosion is added as a function of factors for geology, cover, cutslope height, road length and annual rainfall (Welsh, 2008). Sediment delivery to streams depends on the amount of sediment generated from the road surface and cutslope and factors for road age and distance to stream (Welsh, 2008). The fraction of sediment delivered ranges from zero with buffers longer than 60 m to total delivery at stream crossings.

The USLE is sometimes applied to forest roads (Wischmeier and Smith, 1978). The USLE was originally developed for agricultural conditions, and estimates erosion as the product of five factors based on: rainfall erosivity, soil erodibility, slope length, slope steepness, cover management factor and conservation practice. The model assumes that the soil erodibility is a function of soil properties only, so all other effects of road surface condition and traffic must be accounted for in the cover management factor.

3.2. Process Based

KINEROS

The KINEROS model is a process-based single storm runoff and hydrology model that emphasizes the modeling of overland flow on either a hillslope or within a small watershed (Woolhiser *et al.*, 1990). The KINEROS tool allows users to analyze within storm runoff amounts and sediment transport in detail. Ziegler *et al.* (2001) applied KINEROS2 to road networks in Thailand and found that the model was not

Off-road vehicle best management practices for forestlands: A review of scientific literature and guidance for managers

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ABSTRACT: Management of off-road vehicles (ORVs) on forestlands has become increasingly challenging as various user groups compete for a finite amount of land on which to recreate. Additionally, no uniform methods exist for managing ORVs in forests to reduce their impacts to the environment and lessen conflicts with other user groups. The objectives of this paper are to review recent research on the environmental and social effects of ORVs in forested landscapes, and based upon the best available science, propose Best Management Practices (BMPs) for forestlands to help minimize ORV impacts. We found extensive scientific literature documenting the physical and ecological effects of ORVs in forestlands, ranging from soil compaction to non-native plant dispersal. Many species of wildlife are also affected by ORV use through direct and indirect mortality, disturbance and cumulative loss of habitat. Conflict with non-motorized users has been documented as well, resulting in diminished recreational experience and displacement of quiet users. The BMPs presented here for ORV management and monitoring in forestlands should help managers provide opportunity for motorized recreation while protecting natural resources and reducing user conflicts.

Keywords: *Off-road vehicle, ORV, Best Management Practices, BMPs, erosion, stream sedimentation, invasive species, wildlife disturbance, user conflicts*

effects include undercutting of root systems as vehicle paths are enlarged by erosion, creation of new erosion channels on land adjacent to vehicle-destabilized areas due to accelerated runoff or wind erosion, burial of plants by debris eroded from areas used by vehicles, and reduction of biological capability of the soil by physical modification and stripping of the more fertile upper soil layers. Biological soil crusts (commonly found in deserts, but also present in some forestlands) are particularly sensitive to wind erosion following ORV use and take decades to recover (Belnap 2003).

Stream Sedimentation Research

While driving on roads has long been identified as a major contributor to stream sedimentation (for review see Trombulak and Frissell 2000), recent studies have found ORV use on trails to be a significant source of fine sediment in streams (Chin et al. 2004, Ayala et al. 2005, Welsh 2008). Stream sedimentation greatly degrades aquatic habitat (Newcomb and MacDonald 1991). For example, Chin et al. (2004) found that in watersheds with ORV use streams contained higher percentages of sands and fine sediment, lower depths and lower volume – all characteristics of degraded stream quality.

While forest roads often have greater erosion potential, ORV routes often lack culverts or bridges at stream crossings, and users often simply drive across creeks. By fording creeks, sediment is released into the water by several mechanisms including: 1) concentration of surface runoff through the creation of wheel ruts, 2) exposed surfaces from the existence of tracks, 3) increased runoff from soil compaction, 4) vehicle backwash, and 5) undercutting of banks from waves (Brown 1994). A modeling exercise found that the average annual sediment yield from one ORV stream crossing in Alabama could reach 126.8 tons/ha (Ayala et al. 2005). Another study in Colorado found that ORV trails produced six times more sediment than unpaved roads and delivered 0.8 mg/km² of sediment to the stream network each year (Welsh 2008). Coe and Hartzell (2009) recently reported that the well-traveled Rubicon jeep trail in California's Sierra Nevada Mountains had rates of stream sedimentation 50 times higher than adjacent forest roads.

Best Management Practices for soils

PLANNING AND DECISION-MAKING BMPs FOR FOREST SOILS

- Do not locate routes in areas with highly erodible soils.
- Locate routes only in areas with stable soils; avoid locating routes in areas with biological crusts.
- Do not locate routes to climb directly up hillslopes. Route grades should be kept to a minimum and not exceed an eight degree (15 %) grade.
- Do not locate routes above treeline or in other high elevation areas that are ecologically significant and/or especially prone to erosion.
- Locate routes a minimum distance (as listed below) from waterbodies and wetlands:
 - Fish-bearing streams and lakes – 91 m (300 ft)
 - Permanently flowing non-fish-bearing streams – 46 m (150 ft)
 - Ponds, reservoirs, and wetlands greater than one acre – 46 m (150 ft)
- Do not designate new routes requiring stream crossings and prioritize closure, re-routing or creating bridge crossings for existing routes that have stream crossings.
- Do not locate routes in areas with soils contaminated by mine tailings, or mine tailings reclamation sites, at least until they are recovered, fully stable and able to sustain safe ORV usage. If route construction is necessary, reclamation activities should be completed prior to route construction.
- Close and restore routes that cause high levels of erosion (e.g., raise sedimentation above Total Maximum Daily Loads (TMDL) and reduce native fish population potential).
- Require all motorized camping to occur in designated campsites. Reclaim undesignated motorized camping sites.

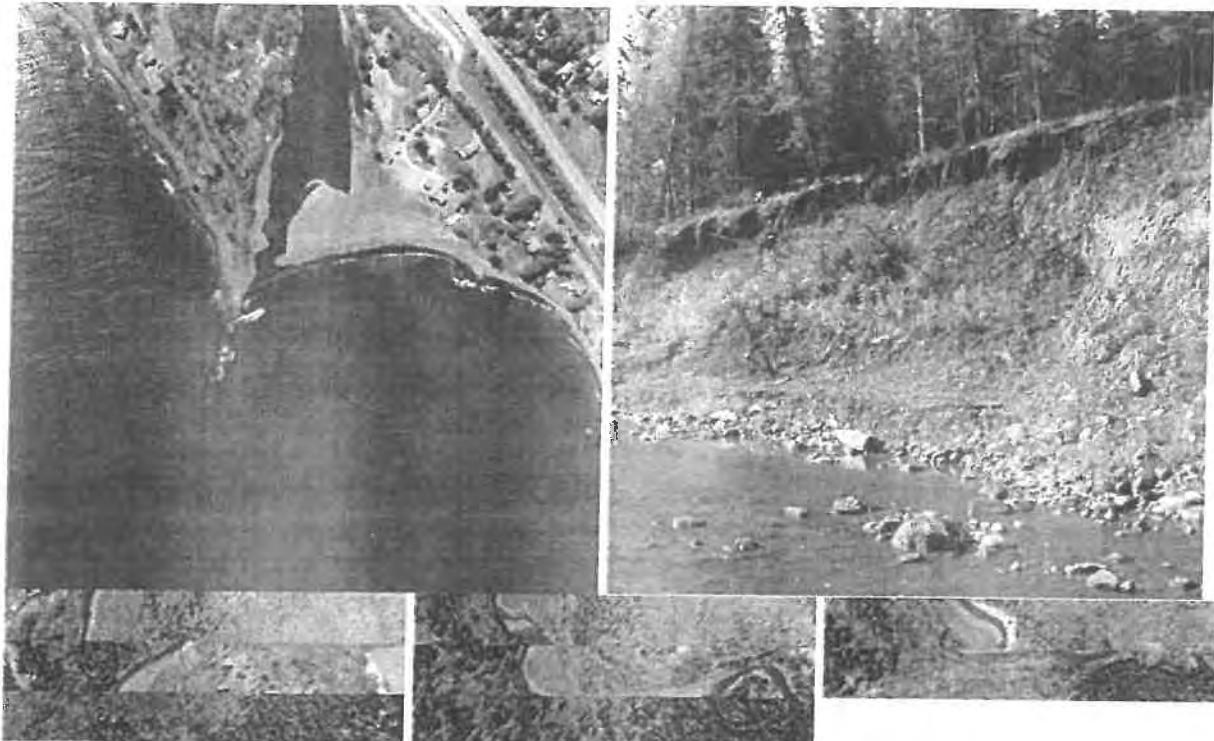
IMPLEMENTATION BMPs FOR FOREST SOILS

- Identify the type or types of soil and steepness in the area that is being affected by ORVs and use this

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**A report prepared for the Minnesota Pollution
Control Agency**

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Traffic

Roads were developed for traffic, yet trafficking can greatly affect sediment transport and erosion rates along roads. Vehicle traffic (especially heavy vehicle traffic) can encourage rut development and deform the road surface. If vehicle traffic is seasonal or changes intensity this can break up the armored road surface creating a highly erodible condition. For gravel roads aggregates are broken down when forced into the sub-grade, this can decrease hydraulic conductivity and increase runoff and erosion (Reid & Dunne, 1984). Increased traffic rates on gravel roads are reported to increase sediment concentration by 2.7 fold in Marysville Australia (Sheridan et al., 2006), Ramos-Scharron and MacDonald (2005) found greater traffic levels increased the supply of fine material by 2 – 1000 times that of lower levels. Even temporary changes in usage can amount to large differences in road sediment losses, as noted by Reid and Dunne (1984) whom compared weekdays to weekends finding a 7.5 rate increase for weekends (Figure 6).

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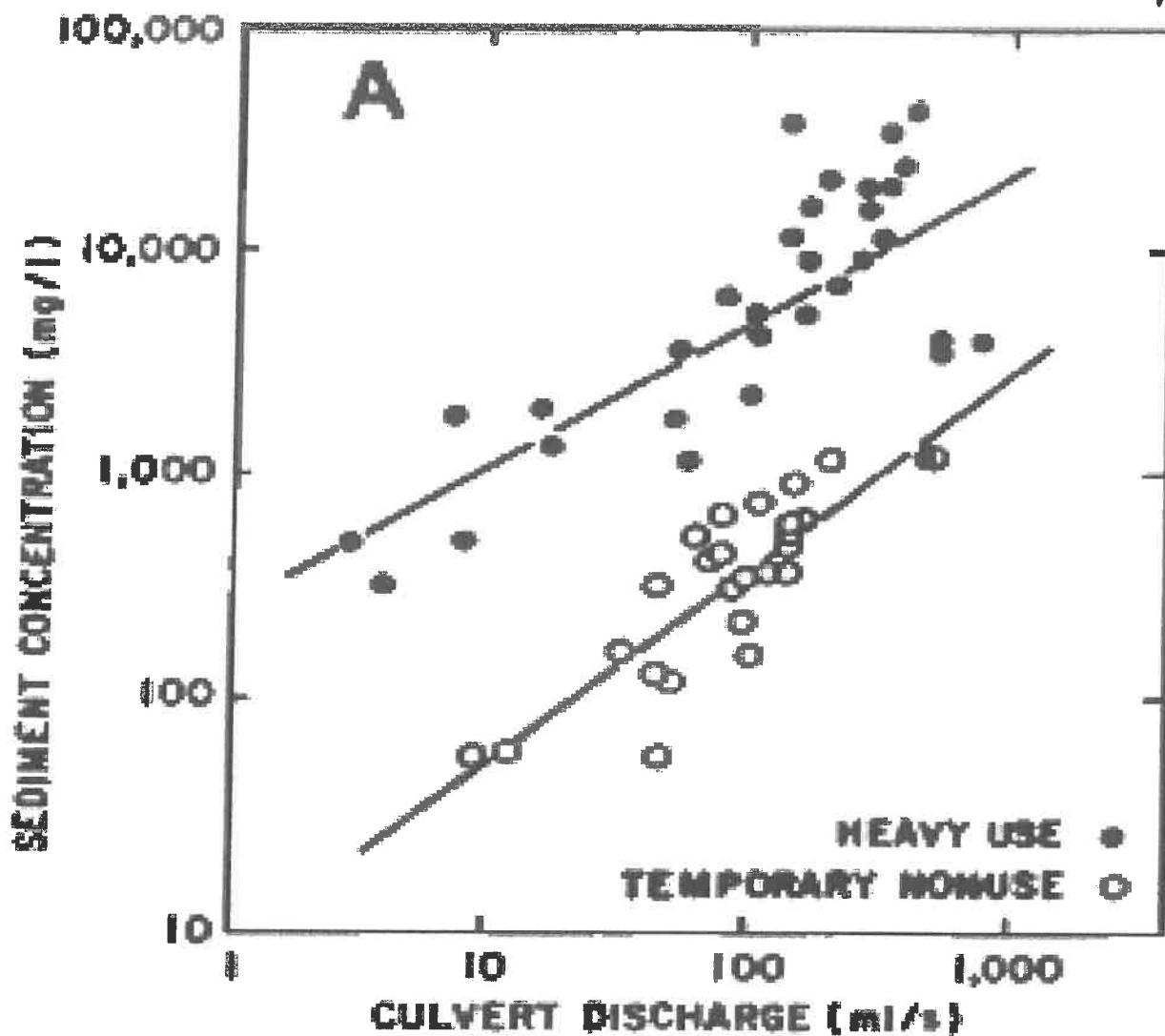


Figure 6. Sediment concentrations as a result of traffic usage (from Reid and Dunne 1984)

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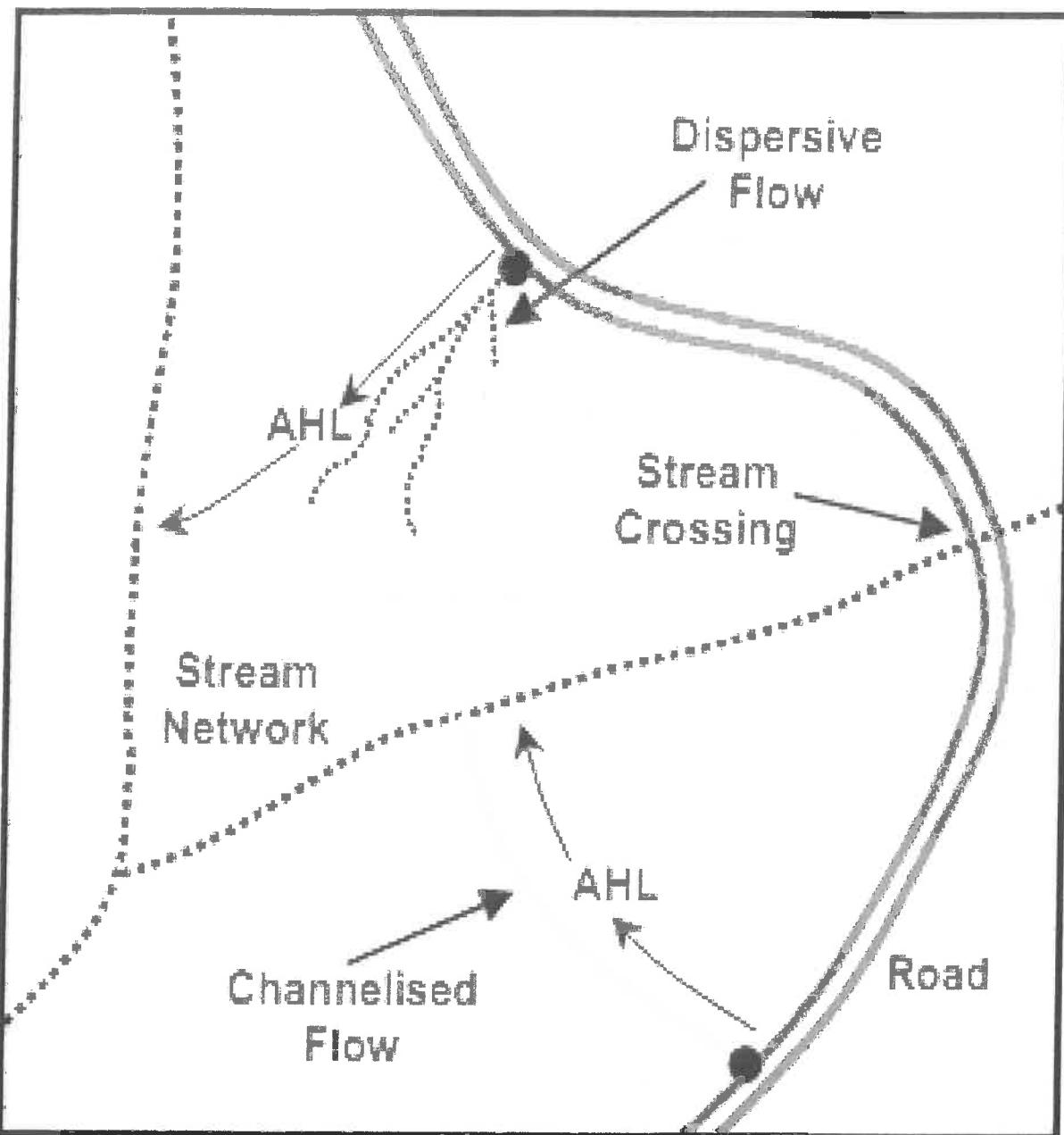


Figure 3. Examples of runoff pathways (from Croke et al., 2005)

was mainly due to scarce vegetation rather than construction type. However this was not considered a large source of sediment with the majority (90%) of observations indicating fillslopes were fully vegetated between 80-100%.

Wemple et al., (2001) found road placement, condition, watershed geology and storm characteristics may have contributed greatly to sediment losses; variables indicated within this study to be major predictors of erosion. Although spatially, gully processes were not observed to be the dominant mode of road-stream connectivity, much of the observed erosion is estimated to result from increases in surface road runoff upon fillslopes (24% of sample set, cut/fill 17%, cutslopes 13%). Given the findings of Wemple et al (2001) road type, position and condition; hillslope vegetation, watershed geology, are all determinants of future sediment losses along roadsides, factors also augmented by severe weather.

Model predictions: Road survey site

Observed sediment losses were predicted using logistic regression at the road survey site and watershed level. This was to allow for possible separation of road specific and watershed specific factors.

Presence of Erosion: Traffic

Survey sites were visited once in the summer of 2010, with the assumption that observed traffic patterns may fluctuate by the hour, weekday and seasonally. To counteract possible bias, roads were given a binary indicator of "1" if in use or "0" if closed and vegetated. Using logistic regression the presence of erosion was best predicted at the road segment scale by traffic ($p=0.1326$, weighted AIC = 0.5924). Low levels of traffic had a negative relationship to the presence of erosion, therefore minimally trafficked roads were observed to have limited erosion observations. Sites considered "low traffic" or "closed" was 12 (22% of the dataset, with 15% of sites gravel or unsealed, 7% paved).

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Ecological effects of roads: Toward three summary indices and an overview for North America

4. Key deer *Odocoileus virginianus clavium*, a small subspecies of the white-tailed deer; U.S. listed; islands at southern tip of Florida; population ca. 250-300; ca. 44 roadkills per year, which is 75-80% of all known deaths (Calvo & Silvy 1996).
5. Northern long-eared bat *Myotis septentrionalis*; Canada listed; Mount Revelstoke National Park, British Columbia; only known breeding location for the species is bisected by Trans-Canada Highway; mortality rate unknown (Woods & Munro 1996).
6. Texas subspecies of the eastern brown pelican *Pelecanus occidentalis*; South Texas and Port Isabel/Brownsville region; population ca. 75-100; 4-8 roadkills per year reported on 4-lane coastal causeway bridge (Jenkins 1996).
7. Royal tern *Sterna maxima*; Florida; bridge; mortality rate unknown (Evink 1996).
8. Barn owl *Tyto alba*; California's Central Valley; species declining in Southern California; since 1916 roadkills increasing in the Central Valley of Central California, and now appear to be the major cause of mortality here (Moore & Mangel 1996).
9. American crocodile *Crocodylus acutus*; U. S. endangered; Florida; roadkills are 46% of human-related mortality (Smith et al. 1996).
10. Desert tortoise *Gopherus agassizii*; U. S. threatened; Highway 58, Mojave Desert, California; one roadkill per 2.4 km of road per year (Ruby et al. 1994, Boarman & Sazaki 1996).
11. Houston toad *Bufo houstonensis*; U. S. endangered; State Road 21, Bastrop County, South Central Texas; amphibian tunnel installed; mortality rate unknown (Thomas Griebel, personal communication, Jenkins 1996).

Finally, roads strongly affect processes across the landscape (Harris et al. 1996). For example, the road network contributes significantly to reducing fire frequency in Florida where several U.S. endangered species are dependent on habitats maintained by fire (Stevenson 1996). Similarly freshwater mussels or clams might have the highest percentage of threatened species in the United States, and road networks overlaid on stream systems probably contribute significantly to this effect (Fig. 2B).

In short, road location is an important integrator or predictor of diverse ecological effects. Large natural-vegetation patches, connectivity between them, and major vegetated stream corridors are prime consideration in planning and conservation (Forman & Collinge 1995). But road locations relative to topography, rare habitats, and rare species are also of major importance.

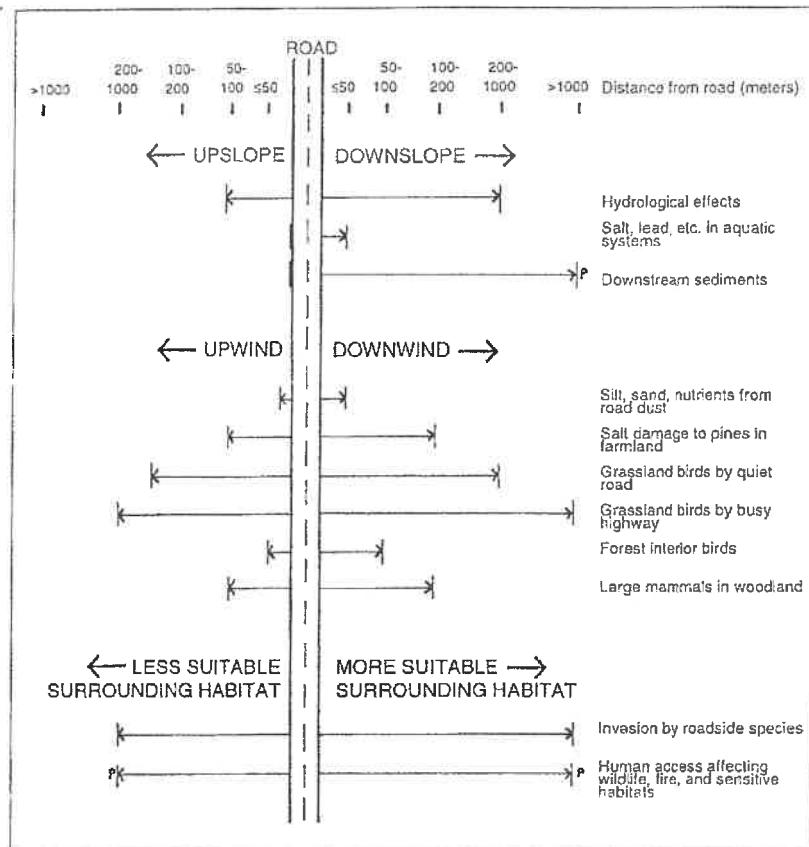
Road-effect Zone

Not surprisingly, the highly diverse ecological effects of roads vary widely in how far outward they extend from the road. These distances of significant impacts from the road surface have been summarized by Reck & Kaule (1993) and Forman (1995), and vary from a few meters to a few kilometers (Fig. 3).

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However, the effects almost always extend different distances on opposite sides of the road. This pattern is due primarily to the directional processes and asymmetrical arrangements of slope, wind, and habitat suitability in the landscape. Thus slope mainly causes unequal effects for water and material carried by water (Fig. 3). Wind causes marked asymmetries in light-weight materials such as dust and salt, in addition to traffic noise effects. Habitat suitability is especially important to species movements and to human access effects on opposite sides of a road. In essence, the road-effect zone is asymmetrical with highly convoluted borders.

Figure 3.
Road-effect zone defined by ecological effects extending different distances from a road.
Most distances are based on specific studies (Forman 1995).
However, distance extending to left is arbitrarily half that to the right.
"P" indicates an effect primarily at specific points.



Most ecological effects are relatively continuous along a road. However, a few effects are concentrated at specific spots, such as sedimentation downstream of a bridge or hunting effects around a human access point in a remote area (Fig. 3).

Finally, the road-effect zone is many times wider than the road surface with its roadsides. For example, let us assume that the average road and roadside is 30 m (e.g., road surface 10 m, plus the combined width of adjacent 10 m roadsides, which may include scraped, mowed, ditched, etc. areas) for the 6 million kilometers of public roads covering one percent of the contiguous United States. Then averaging the lengths of arrows in Fig. 3 provides a conservative estimate that direct ecological effects extend over a distance

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of 400 m width (some 200 m on each side of the road surface). Dividing 400 by 30 suggests that direct ecological effects extend over an area >10 times the road/roadside width, though note that both the numerator and denominator are rough estimates and that many variables are involved. Nevertheless, as a preliminary hypothesis, more than 10% of the contiguous United States is directly impacted ecologically by roads.

Wildlife-crossing structures

Diverse mitigation structures from 0.2 to 200 m wide have been constructed to enhance movement of animals across roads (including highways) (Forman & Hersperger 1996). Most have been monitored and found to have wildlife species crossing. Most of the structures are in Europe. Therefore the following list, though probably incomplete, is presented as an overview of the wildlife-crossing structures existing in North America.

Amphibian tunnels

Two 25 cm wide tunnels on Henry Street in Amherst, Massachusetts enhance the huge spring migrations of spotted salamanders *Ambystoma maculatum* (Jackson 1996). One of these tunnels on State Highway 21 in Bastrop County, Texas was built for the U.S. endangered Houston toad *Bufo houstonensis*, and has had limited success (Thomas Griebel, personal communication; Jenkins 1996).

Culverts and ecopies

Culverts along Highway 58 in the Mojave Desert of California vary from 0.9 to 3.6 m width, and from 33 to 66 m length. They are used by the desert tortoise, coyote *Canis latrans*, kit fox *Vulpes macrotis*, and jackrabbit *Lepus californicus* (Ruby et al. 1994, Boarman & Sazaki 1996). No reports have been located of ecopies (like badger tunnels in Europe; Natuur over Wegen 1995), that is, pipes or tunnels designed for movement of mid-sized mammals, but not for water flow.

Underpasses

Best known are the 23 underpasses (plus 13 bridge extension locations) along Alligator Alley (Interstate Highway 75) in South Florida (Foster & Humphrey 1995). They are 21-26 m wide and 48.5 m long. They were primarily built to enhance groundwater flow to the Everglades, plus movement of Florida panthers across the highway. Two underpasses built nearby on Route 29 for panthers are 7.3 m wide and 14.3 m long (Land & Lotz 1996). One underpass of the same type was built primarily for black bears on Route 46 in Lake County, Central Florida (Roof & Wooding 1996). The objectives were apparently accomplished at all three highways. In addition, many other species also crossed regularly in underpasses at all three highways, including bobcat *Lynx rufus*, white-tailed deer, alligator *Alligator mississippiensis*, raccoon *Procyon lotor*, turkey, fox, otter *Lutra canadensis*, and black bear. Numerous species have crossed in the large underpasses of Interstate 75. Armadillo *Dasypus novemcinctus*, opossum *Didelphis virginiana*, rabbit, and gopher tortoise *Gopherus polyphemus* crossed in the Route 46 underpass (Evink 1996, Land 1996, Roof & Wooding 1996).

Monitoring fugitive dust emissions from off-highway vehicles traveling on unpaved roads and trails using passive samplers

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Abstract Vehicles traveling on dry, unpaved roads generate copious quantities fugitive dust that contributes to soil erosion, and potentially threatens human health and ecosystems. The purpose of this study was to develop a low-cost technique for monitoring road dust that would enable land managers to estimate soil loss. The “sticky-trap” collectors developed were evaluated at the Turkey Bay off-highway vehicle (OHV) riding area on the Land Between the Lakes National Recreation Area, in western Kentucky. The

results showed that the dust plume created by vehicle traffic was heterogeneous: larger particles were in the lower part of the plume and deposited closer to the source, smaller particles were carried higher in the plume and traveled at least 100 m away from the source. Collection of particles parallel to the source was also heterogeneous, suggesting that measurements taken at a single point may not be appropriate for estimating erosion losses. Measurements taken along two trails indicate that when large numbers of riders are present, dust concentrations may reach unhealthful conditions for riders, but that it is unlikely that fugitive dust is harming native vegetation, given frequent rainfall. The study demonstrated that OHV traffic contributes to substantial erosion of roadbeds because of aeolian transport.

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Keywords Fugitive dust · Particulate air pollution ·
Soil erosion · Aeolian erosion

Introduction

Fugitive dust created by recreational off-highway vehicles (OHV) is an increasingly serious problem for land managers. Recreational traffic increases maintenance costs for critical access roads, accelerates erosion and run off, damages ecological structure and function, and can threaten human health. But the consequences of OHV traffic are quite site-specific,

often influenced by weather conditions and can vary widely depending on the vehicle itself and the driving behavior of the operator (Etyemezian et al. 2003; Reheis and Kihl 1995). Before effective control measures can be implemented, land managers need a clear understanding of how much dust is generated under given conditions, and how far dust is migrating from the source.

Off-highway traffic on unpaved roads clearly disturbs the roadbeds, loosening the surface increasing the potential of surface erosion during rain events, and aeolian transport when it is dry. Erosion of road surfaces during rain not only damages the road, but also can lead to siltation of streams and wetlands, harming habitat, degrading water quality, and potentially impacting drinking water resources. Aeolian transport of dust during dry spells leads to accumulation of dust on roadside vegetation, which can impair solar function by reducing photosynthetic capacity and gas exchange (Farmer 1993; Grantz et al. 2003). Fugitive dust also damages foliage by abrading surfaces reducing the integrity of the cuticle boundary (Eveling 1986). And clouds of dust are irritating to human lungs: prolonged exposure may lead to long-term impairment of pulmonary capacity.

Adequate quantification of aerial migration of dust created by OHV activities is often lacking. In part, because atmospheric monitoring techniques for particulate pollutants generally focus on the fine particulate fraction known to impact human health, and because monitoring methods for human health usually entail expensive equipment that do not yield spatial resolution of source-sink relationships. A 1983 Forest Service estimate of aeolian erosion was 564 kg/km (1 ton per mile) in 1 year for one vehicle, traveling once a day on an unpaved road (Frazer 2003). An annual rate of soil loss at 300 kg/ha (300 lb/ac) for forested land is considered normal (Munsell 2004).

This study was designed to measure the quantity of soil displaced by aeolian erosion due to vehicle traffic. The goal was to understand the relationship between vehicle use intensity and dust creation. The amount of dust generated was determined by weight using simple sticky-trap devices developed for monitoring fugitive dust. Atmospheric particulate loads relevant to human health were measured using electronic instruments for PM_{2.5}, and visualization of particles was conducted using scanning electron

microscopy (SEM). Portable weather stations were used to measure wind speed and direction, temperature and relative humidity at the test sites.

Secondary objectives were to evaluate the effect of dust accumulation on native vegetation, and the potential for impacts to human health by suspended particles. For these questions leaf samples were collected and viewed by SEM to determine damage to cuticle surface and interference with stomata opening. Portable electronic particulate monitors were deployed at the two test sites to quantify atmospheric concentrations of particles less than 2.5 μm – the US Environmental Protection Agency standard for damage to respiratory tissues.

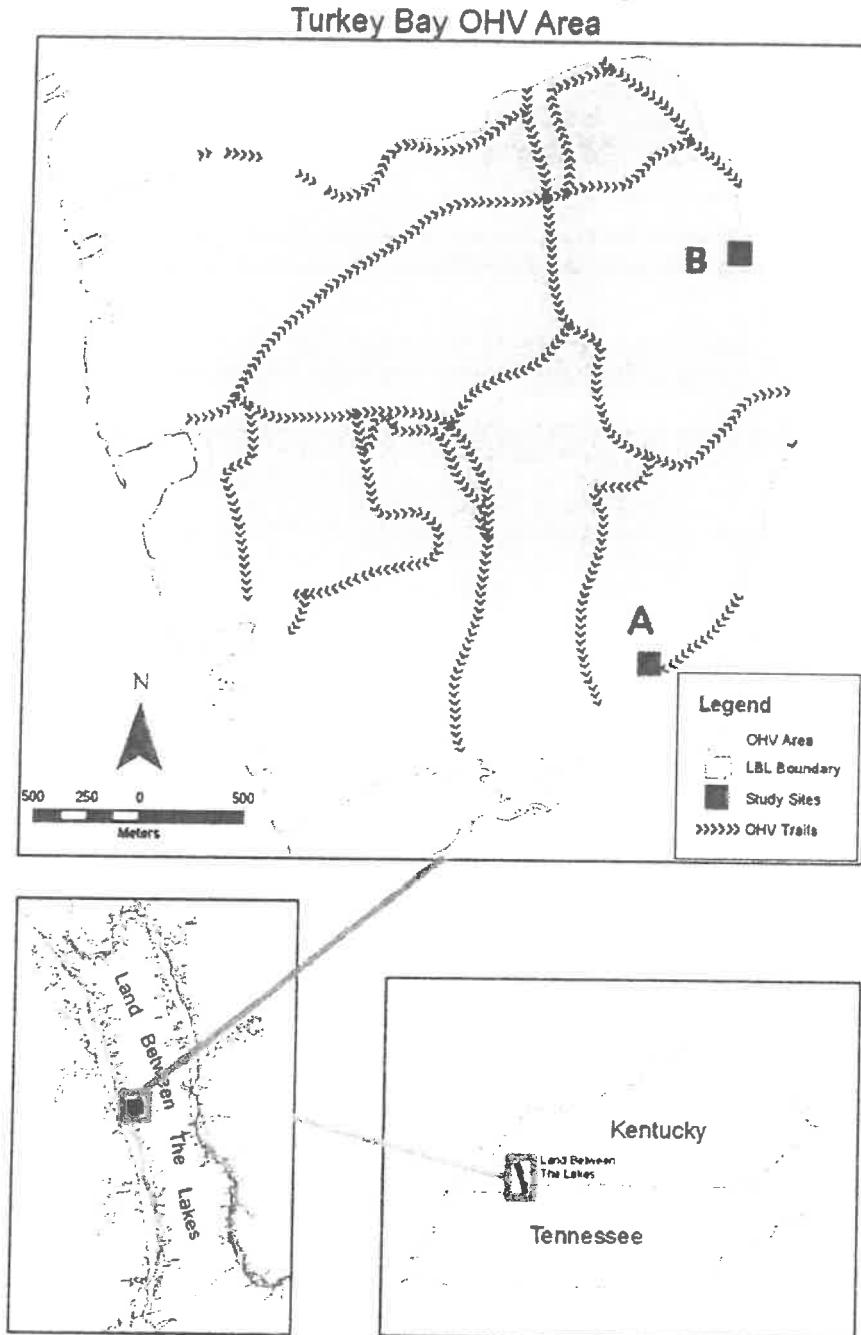
Methodology

Site description

The Turkey Bay OHV area is part of the Land Between the Lakes (LBL) Recreational Area in western Kentucky (Fig. 1). The OHV area, roughly 688 ha (1,700 acres), has been set aside for use by any operator of an OHV. The area was originally designated by the Tennessee Valley Authority in 1975 and has been operated as an open riding (riders were not restricted to designated trails) area ever since. The USDA Forest Service acquired the property in 1999. Under Forest Service guidelines, the area must be managed for preservation of the resource in addition to recreation. Changes in, and increases in usage have left the area severely scarred and impacted. Impacts include severely denuded and eroded hillsides, loss of leaf litter and topsoil, compacted soils, heavily disturbed and dead flora, and dust everywhere.

Two test sites were chosen. The first site was along a broad main trail close to the entrance station (labeled "A" on Fig. 1). The trail was bordered on the north side with woods, and on the south side with an open field. The second site (labeled "B" on Fig. 1), was about 1 km further into the trail network where the trails are narrower. The second site (referred to as the "tunnel") was bordered by dense forest vegetation on both sides and a nearly enclosed canopy. The trails ran north–south therefore the sampling grids were on the east and west sides of the trail. The sampling transects were established along the edges of the trails

Fig. 1 Site location and location of Turkey Bay off highway vehicle area



with points at 50 m intervals along the trail and in three rows 50 and 100 m away from the trail, for a total of 20 sampling points along the main trail and 30 sampling points along the tunnel trail. Adjustments to the grid were made to accommodate terrain and rider safety.

Dust measurements

The study employed three techniques for assessing dust production and characteristics: scanning electron microscopy; portable, electronic real-time particulate monitors; and passive dust collectors developed for

this study. A JEOL-T-330 scanning electron microscope housed at the Hancock Biological Station research facility, part of Murray State University, near the Turkey Bay OHV area was used to determine the physical characteristics of the dust particles, to assess damage to leaf surface, and to evaluate surface loads of dust on leaves. Leaves were harvested from along the trails and from trees 25 m or more away from the trails to investigate high and low deposition. Four common species were chosen autumn olive (*Eleagnus umbellata*), staghorn sumac (*Rhus typhina*), sycamore (*Platanus occidentalis*), and wild grape (*Vitis spp.*). Discs of leaves were prepared using a common 7 mm diameter hole punch. Each leaf disc was cut in half so that the upper and lower surfaces of the same sample could be viewed. Leaf discs were mounted on aluminum stubs with double-stick tape and sputter coated with a gold/palladium mix. Polaroid micrographs were taken of representative samples to catalog dust and cuticle features. The micrographs were subsequently scanned into Photoshop for electronic duplication and presentation.

Ambient atmospheric aerosol concentrations were measured in real time with two MEI DataRam 2000 (Thermo Electron, Cincinnati, OH, USA). These instruments calculate aerosol concentrations by light scattering and record concentrations at 1-minute intervals to an internal data logger. The DataRams were outfitted with critical cut point nozzles so that only particles smaller than 2.5 μm were measured. One DataRam was deployed in the front field (labeled A in Fig. 1), on the south side of the main trail. The instrument was set up 20 m south of the trail and 2 m above the ground. It was in an open field with unhindered airflow. The second DataRam was set-up in the tunnel site. 1 m west of the trail, 0.5 m off the ground and surrounded by dense vegetation. This location was chosen partially to keep the instrument hidden when not attended, and partially to evaluate the effect of vegetation on dust movement. The monitors were deployed continuously during the exposure period.

The passive dust collectors were constructed from 5.5 cm disposable Petri dishes. Each dish was coated with a thin layer of environmentally stable Tangle-Trap® (The Tanglefoot Company, Grand Rapids, MI, USA) brush-on insect trap (Fig. 2). A 1- cm^2 strip of heavy duty Velcro was glued to the back of each collector. Each collector was weighed for the pre-



Fig. 2 Preparation and set up of passive samplers

exposure (before) weight, and the weight recorded on the collector. In the field, the collectors were mounted on 5-m aluminum conduit using Velcro at 1.3, 2, 3.2 and 5 m above the ground (Fig. 2). The poles were held in place by sliding the hollow conduit over 1 m length of rebar pounded into the ground. Several