Minnesota Department of Natural Resources

Ecological and Water Resources

Fish and Wildlife

Report:
Minnow Harvest in Waters Listed as Infested with Aquatic Invasive Species

August 2016

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Executive summary

Aquatic invasive species (AIS) are species that are not native to the state and that have the potential to cause harm to human health, the economy, the environment or that threaten the use of natural resources in Minnesota. The Minnesota Department of Natural Resources (DNR) to lists lakes, wetlands and rivers that contain, or are highly likely to contain, certain species of AIS as "infested" water bodies.

In Minnesota, it is generally illegal to harvest bait from water bodies listed as infested with AIS, with the following exceptions: by permit, licensed minnow dealers may commercially harvest minnows in certain infested waters using tagged gear and equipment after attending annual AIS training; and in a few limited situations anglers may harvest minnows for personal use.

In 2014, the DNR undertook a project to examine current policy governing bait harvest in infested waters and to develop recommendations for changes. The DNR sent out a questionnaire to all licensed minnow dealers to better understand their perspectives. The DNR convened a group of stakeholders including licensed minnow dealers, anglers who harvest bait for personal use, and others familiar with the issue. Over the course of four meetings from August to October 2014, the core stakeholder group examined the process of bait harvest, the risks of spreading AIS during bait harvest, and developed recommendations for changes to policies.

The DNR asked the group to focus on recommendations that would:

- maintain or reduce the risk of AIS introduction or spread compared to current laws and regulations;
- make operations more efficient and effective for bait harvesters and DNR staff;
- apply statewide, without exceptions for specific geographic areas or user groups; and
- be easy for enforcement staff to interpret and apply in the field.

This report describes the process by which the group developed recommendations and presents those recommendations.

Summary of recommendations

The group developed nine recommendations for the DNR:

1. Allow licensed minnow dealers to haul up to three sets of gear and equipment simultaneously for use in infested and non-infested waters, or waters where different types of AIS are present.
2. Assess the feasibility and cost of implementing a program that would allow minnow harvest for personal use from infested waters where commercial minnow harvest can

currently be permitted. *Bait harvest for personal use from most infested waters is currently prohibited by statute and DNR does not have the authority to issue a permit to allow non-commercial bait harvest in listed infested waters.*

3. Continue work with cast nets to better understand their effect on fisheries resources. *At the time of these stakeholder meetings, cast nets were not a legal gear type in Minnesota*.
4. Work with partners to study the presence of zebra mussel veligers in water moved with minnows when harvesting from waters listed as infested with zebra mussel, as well as the presence and density of zebra mussel veligers at different temperatures and dates in Minnesota lakes.
5. Seek statutory authority to issue permits that would allow the transportation of prohibited AIS for the purpose of decontamination.
6. Explore the feasibility of permitting licensed minnow dealers to harvest minnows in most waters listed as infested with spiny waterflea.
7. Strive to coordinate policies affecting different user groups in infested waters as new policies are developed.
8. Develop a protocol to allow licensed and permitted minnow dealers to remove tags from non-felt soled waders used in waters listed as infested with zebra mussel.
9. Consider alternative methods for decontaminating bait harvest gear and equipment.

2016 update

Since the stakeholder meetings and resulting recommendations described in this document were finalized in early 2015, the DNR has taken steps to address some of the recommendations. In particular:

- Related to recommendation 3, a statutory change in 2015 authorized the DNR to permit harvest of gizzard shad for personal use as bait with cast nets in certain water bodies through December 1, 2017 (*Minnesota Statutes*, section 84D.03, subd. 3 and *Minnesota Statutes*, section 97C.345). The DNR is required to report to the legislature on this program by March 1, 2018.
- The DNR monitored veliger densities and water temperatures at lakes in different parts of the state in 2015 and 2016. These data will be used to assess the criteria currently used to close zebra mussel infested waters to bait harvest, as in recommendation 4.
- In 2015, the legislature gave authority to the DNR to issue prohibited invasive species permits for the purpose of decontamination (*Minnesota Statutes*, section 84D.11 subd. 1); see recommendation 5.

- DNR Fisheries, Enforcement, and invasive species staff continue to discuss how to best implement other recommendations.

The rest of this document is written to summarize the discussions and recommendations that were made by the stakeholder input process in 2014, and those sections have not been updated to reflect actions that the DNR or others may have taken in 2015 or 2016.

Introduction

Background

Aquatic invasive species (AIS) are species that are not native to the state and that have the potential to cause harm to human health, the economy, the environment or that threaten the use of natural resources in Minnesota. The Minnesota Department of Natural Resources (DNR) has authority under Minnesota law to manage and prevent the spread of aquatic invasive species in the state. Minnesota law authorizes the DNR to list as "infested" water bodies that contain, or are highly likely to contain, certain species of AIS.

Fishing is an important part of the culture and economy of Minnesota. In 2013 Minnesota led the nation in per-capita fishing license sales.[1] Anglers commonly use live bait, including minnows.[2] Live bait sales contribute to a multi-billion dollar recreational and tourism economy in Minnesota.

Minnow harvest for commercial and non-commercial purposes is allowed in most public lakes, wetlands and rivers in Minnesota that are not listed as infested with AIS. To harvest minnows for commercial purposes, a person must have an angling license and a minnow dealer license from the DNR. People may harvest minnows for non-commercial purposes from many water bodies with an angling license. Each year, the DNR issues approximately 260 minnow dealer licenses. The DNR does not know the number of licensed anglers that harvest minnows for personal use.

It is generally illegal to harvest bait from water bodies listed as infested with AIS in Minnesota, with the following two exceptions:

1. Licensed minnow dealers can obtain a permit from the DNR to harvest bait in waters listed as infested with Eurasian watermilfoil, flowering rush, faucet snail or zebra mussel, and in certain waters infested with spiny waterflea. Permittees must complete AIS training each year, must attach tags to any gear and equipment used in different types of infested waters, and have to follow permit conditions to reduce the risk of moving AIS from infested waters.

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[1] Minnesota Department of Natural Resources. "Minnesota facts & figures: fish & fishing." Last updated March 28, 2013. Available at: http://www.dnr.state.mn.us/faq/mnfacts/fishing.html (accessed November 19, 2014)

[2] "Minnows" here and elsewhere in this report is defined as in state law to mean "(1) members of the minnow family, Cyprinidae, except carp and goldfish; (2) members of the mudminnow family, Umbridae; (3) members of the sucker family, Catostomidae, not over 12 inches in length; (4) bullheads, ciscoes, lake whitefish, goldeyes, and mooneyes, not over seven inches long; (5) leeches; and (6) tadpole madtoms (willow cats) and stonecats." (2014 *Minnesota Statutes*, section 97A.015, subdivision 29)

2. Anglers can harvest bait in infested waters that are listed as infested only with Eurasian watermilfoil using certain gear. Anglers may also harvest certain fish species by hook and line from listed infested streams or rivers for non-commercial, personal use, provided they use the fish as bait on the same body of water where caught (*Minnesota Statutes*, section 84D.03, subd. 3.)

Because of the risk of invasive fish species being mixed into wild-caught bait[3] and leading to spread of those AIS, bait harvest is prohibited in most waters that are infested with invasive fish. Other AIS, like plant fragments and invertebrates, can also be found in live bait. For example, in 2012, a faucet snail was found among leeches for sale at a northern Minnesota bait shop.[4] Other Minnesota laws are intended to reduce the risk of introducing and spreading AIS via bait: it is generally illegal to import minnows into the state (*Minnesota Statutes*, section 97C.515) and it is illegal to dispose of bait in state waters (*Minnesota Statutes*, section 84D.10, subd. 4)

Description of process to review bait harvest policies

The DNR initiated this review of policies governing bait harvest in infested waters in 2014.

Throughout the policy review process, the DNR consulted with affected parties. In May 2014 a confidential questionnaire was mailed to all minnow dealers who held a license at that time. The DNR sent out a total of 164 questionnaires and received 74 responses, a response rate of 45 percent. See Appendix 4 for a summary of the responses to this questionnaire. As part of this initial contact, the DNR also invited all potentially affected minnow dealer licensees to be a part of a core group of stakeholders that would inform the policy review process and an assessment of the risk of AIS transfer during bait harvest activities.

The core stakeholder group included: licensed minnow dealers; licensed anglers harvesting their own bait for personal use; AIS or fisheries officials from various tribal communities; representatives of Minnesota Sea Grant; and representatives of the DNR divisions of Fish and Wildlife (Fisheries Section), Ecological and Water Resources, and Enforcement. Minnow dealer licensees and others were also given the opportunity to participate in the process as part of an advisory stakeholder group. The DNR hosted a "Basecamp" website to share meeting notices

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[3] Drake, D. A. R. and N. E. Mandrak. 2014. Ecological risk of live bait fisheries: a new angle on selective fishing. Fisheries 39(5): 201-211.

[4] Herwig, C., J. Rendall, and N. Olson. 2012. "Minnesota DNR Rapid Response Summary: Faucet Snails, Mahnomen, Becker, and Norman Counties, Minnesota, 2012 (Draft)." Available at: http://files.dnr.state.mn.us/natural_resources/invasives/rapid-response-faucetsnail.pdf (accessed November 19, 2014)

and documents. Individuals serving as part of either the core or advisory stakeholder group were invited to have access to this website.

The core stakeholder group convened in Brainerd, Minnesota for four meetings that were each five hours in duration. The first two meetings focused on gaining a better understanding of the process of bait harvest and the potential for AIS movement. At the first meeting, on August 20, 2014, DNR facilitators and project managers introduced the policy review project and its objectives to the group. Then meeting participants worked together to refine draft diagrams describing the processes used to harvest minnows. On September 10, 2014, participants used the diagrams from the first meeting to identify steps in the bait harvest process where AIS might be moved from an infested water body. Participants also identified actions that could be used to reduce the risk of AIS movement during those steps (see Appendix 3 for process diagrams with the risk and corrective actions as noted by the core stakeholder group). DNR staff introduced some of the concerns related to bait harvest policies of which the agency was already aware. DNR staff also explained that, in order for the DNR to implement the group's recommendations, each recommendation should meet the following criteria:

- Does not increase risk: recommended changes should maintain or reduce the risk of AIS introduction or spread compared to current law/regulation.
- Simplifies operations: recommended changes should make operations more efficient and effective for bait harvesters and DNR staff.
- Applies statewide: recommended changes should apply statewide, without exceptions for specific geographic areas or user groups. However, different policies for commercial and non-commercial harvest may be justified based on differences in process and risk.
- Enforceable: recommended changes should be easy for enforcement staff to interpret and apply in the field.

The last two meetings of the core stakeholder group focused on brainstorming and refining recommendations to the DNR. On October 1, 2014, the group discussed their concerns related to current policies governing bait harvest in infested waters and brainstormed potential changes to those policies that met criteria established by the DNR. On October 29, 2014, the group finalized recommendations to the DNR for changes to policies.

The DNR provided all potentially affected commercial licensees and members of the core and advisory stakeholder groups with the opportunity to review and comment on a draft of this report in early 2015.

Recommendations

After assessing the risks involved with harvesting minnows in waters listed infested with AIS, the core stakeholder group discussed concerns related to current policies and regulations they

must follow when working in listed infested waters. The group developed nine recommendations for changes to policies governing minnow harvest in waters listed as infested with AIS. Those recommendations, each followed by a brief explanation, are as follows:

1. Allow licensed minnow dealers to haul up to three sets of gear and equipment simultaneously for use in infested and non-infested waters, or waters where different types of AIS are present.

   Allowing licensed and permitted minnow dealers to transport sets of gear and equipment for use in infested and non-infested waters, or waters where different types of AIS are present, together on the same vehicle will make minnow harvest easier and more cost efficient. The DNR could develop permit conditions to require that gear and equipment are physically separated and water that drains off gear and equipment is not allowed to enter a water body to ensure that this practice will not increase the current risk of AIS introduction or spread.

2. Assess the feasibility and cost of implementing a program that would allow minnow harvest for personal use from infested waters where commercial minnow harvest can currently be permitted. *Bait harvest for personal use from most infested waters is currently prohibited by statute and DNR does not have the authority to issue a permit to allow non-commercial bait harvest in listed infested waters.*

   While it is likely that minnow harvest for personal use from listed infested waters could be managed with a permitting and tagging system similar to that used for licensed minnow dealers harvesting from listed infested waters, there is not sufficient data available to determine to the cost of implementing such a permitting program. The DNR would have to secure additional resources to administer an additional permit and tagging program. In addition, bait harvest for personal use from most infested waters is currently prohibited by statute and DNR does not have the authority to issue a permit to allow non-commercial bait harvest in listed infested waters.

3. Continue work with cast nets to better understand their effect on fisheries resources. *As of 2014, cast nets were not a legal gear type in Minnesota*.

   The risk of AIS transfer with cast nets could likely be managed with a permitting and tagging system similar to that used for licensed minnow dealers harvesting from listed infested waters. The DNR would have to secure additional resources to administer an additional permit and tagging program. Because cast nets have not been used in the state, the DNR would first need to do additional studies to better understand the effects of cast nets on fisheries resources. If it is determined that cast nets have an acceptable impact on fisheries resources, the DNR could then explore the development and cost of

a program that would allow for the use of cast nets to harvest gizzard shad from the Mississippi and St .Croix Rivers (listed infested waters).

4. Work with partners to study the presence of zebra mussel veligers in water moved with minnows when harvesting from waters listed as infested with zebra mussel, as well as the presence and density of zebra mussel veligers at different temperatures and dates in Minnesota lakes.

   More information about when veligers are present will help the DNR to minimize the closed harvest season that currently exists in all waters listed as infested with zebra mussels without increasing the risk of zebra mussel spread. Minimizing this time period will maximize minnow harvest opportunities for licensed and permitted minnow dealers.

5. Seek statutory authority to issue permits that would allow the transportation of prohibited AIS for the purpose of decontamination.

   As of 2014, it was not legal to transport prohibited AIS for decontamination purposes. An effective decontamination protocol is useless without this permitting authority.

6. Explore the feasibility of permitting licensed minnow dealers to harvest minnows in all waters listed as infested with spiny waterflea.

   The DNR will need to explore permit conditions that would allow for minnow harvest from waters listed as infested with spiny waterflea while not increasing the risk of AIS introduction or spread; for example, requiring all minnows to be frozen during months when spiny waterflea resting eggs are present to ensure that viable resting eggs are not moved along with the minnows.

7. Strive to coordinate policies affecting different user groups in infested waters as new policies are developed.

   Policies that govern different user groups pertaining to the use of listed infested waters were developed based on the different ways each group uses the waters and the different risks of AIS movement posed by their activities. Therefore it would not be appropriate in all cases to harmonize policies for multiple user groups. However, the DNR could work to ensure that any new policies are better coordinated as they are developed.

8. Develop a protocol to allow licensed and permitted minnow dealers to remove tags from non-felt soled waders used in waters listed as infested with zebra mussel.

Developing a protocol to allow licensed and permitted minnow dealers who work in waters listed as infested with zebra mussels to remove the tags from their waders once the harvest season is closed will reduce the need for frequent replacement of waders due to dry rot. DNR staff will supervise removal of tags as well as re-tagging of gear and equipment to ensure waders have been effectively decontaminated.

9. Consider alternative methods for decontaminating bait harvest gear and equipment.

   Current methods allowed for decontaminating gear and equipment used in listed infested waters could damage gear and equipment. Allowing the use of alternative methods that are equally effective would not increase the current risk of AIS introduction or spread, but could extend the life of costly gear and equipment.

The DNR sincerely appreciates the time and thoughtful consideration contributed by the core and advisory stakeholder group members during this process. This project generated a number of recommendations for the DNR to consider. The DNR will notify affected stakeholders regarding changes to policies made as a result of this project.

Appendix 1: Discussion of Recommendations

The core stakeholder group discussed several concerns related to minnow harvest in waters listed as infested with AIS. For nine different topics below, we describe the *concern* that group members expressed about current policies, and summarize the core stakeholder group's *discussion* about the current policies and possible solutions.

1. Hauling multiple types of gear and equipment at the same time

Concern: To comply with permit conditions, minnow dealers may not haul gear and equipment intended for use in infested on the same vehicle as gear and equipment intended for use either in non-infested waters or in waters listed as infested with a different invasive species. As a result, dealers have to make multiple trips or drive more than one vehicle in order to harvest in either infested and non-infested waters, or water bodies with different invasive species present, making operations less efficient and more costly.

For the purposes of this discussion, examples of different gear and equipment types include:

- untagged gear and equipment, for use in waters not listed as infested with AIS, and
- gear and equipment with different infested waters tags.

For example, an array of three different types of gear and equipment could consist of:

1. gear and equipment tagged for use in waters listed as infested with spiny waterflea;
2. gear and equipment tagged for use in waters listed as infested with spiny waterflea *and* zebra mussel; and
3. gear and equipment with no tags, for use in waters that are not listed as infested with an AIS.

Discussion: Core group participants requested that the DNR allow minnow dealers to haul multiple types of gear and equipment on the same vehicle. Participants suggested that one type of gear and equipment could be hauled on a truck while another type of gear and equipment is being hauled on a trailer. One team member also suggested that an overhead rack could be used as another location for hauling gear and equipment. The group discussed whether or not a boat could be used to haul one type of gear and equipment. Some participants thought that the risk of cross-contamination when hauling gear and equipment in a boat may be greater because water might pool in the bottom of the boat after use, thus contaminating other gear and equipment that is later put in the same place. However, it was pointed out that minnow dealers can currently use their boat to transport gear and equipment, and there is no requirement to clean the boat prior to replacing the gear and equipment, so the risk would not be increased.

The group then discussed how to mitigate the risk of residual water transferring AIS from one type of gear and equipment to another.

Some participants asked how DNR employees handle work in infested and non-infested water bodies in the same day. Current policy dictates that all work in non-infested waters is performed first, and any work in infested waters is performed last, just prior to returning to the office (in addition to using tagged gear and equipment, as well as decontamination after use). The group agreed that it would not be practical to require minnow dealers to harvest in non-infested water bodies prior to harvesting in infested waters because the order in which they harvest is not always predictable and it is dictated by where minnows are present. For example, when spottail shiners are running in the Lake Mille Lacs area, harvesters trap minnows in Lake Mille Lacs, an infested water body, in the morning, and follow the run into its non-infested tributaries in the afternoon.

Then the group discussed the current limitations to hauling more than one type of gear and equipment. Minnesota Statutes, section 84D.03, subdivision 3, paragraph (c) states: "Equipment authorized for minnow harvest in a listed infested water by permit issued under paragraph (b) may not be transported to, or used in, any waters other than waters specified in the permit." The phrase "may not be transported to" has been interpreted to mean "may not be transported to within 300' of" and that restriction is currently listed in harvesters' permit conditions. Core stakeholder group members clarified that it is not usually possible to park or otherwise store gear and equipment more than 300' from the water bodies in which they are working. Group members suggested that a distance of 50' or 100' would be workable in most situations. In order to make such a change enforceable, the group suggested that DNR could specify a minimum distance away from a water body that gear and equipment can be moved from one place to another; for example, require harvesters to be a certain distance away from a water body when switching gear and equipment from the boat with gear and equipment from the truck bed.

Finally, the core stakeholder group discussed the need for different protocols that would apply to minnows harvested from waters where spiny waterflea are present, in contrast to minnows harvested in all other types of listed infested waters. Because spiny water flea resting eggs can pass through a minnow's intestinal tract still viable, extra precautions must be taken with minnows harvested from these waters during the time period when resting eggs are present.

2. Personal harvest of minnows in infested waters

Concern: Minnesota Statutes, section 84D.03, subdivision 3, paragraph (a) prohibits most non-commercial bait harvest from infested waters; paragraph (b) contains a few exceptions. Some stakeholders are interested in harvesting bait from infested waters for personal use beyond those exceptions.

Discussion: Some group participants suggested that the DNR should allow personal harvest of minnows in infested waters where commercial minnow harvest can currently be permitted, while others thought this proposal would increase the risk of spreading AIS. The group suggested that if the DNR were to allow personal harvest from infested waters where commercial minnow harvest can currently be permitted, the DNR should also require annual AIS training for individuals participating in that activity. Some harvesters suggested that AIS training should be required for harvesting minnows in all water bodies. DNR participants pointed out that beginning on March 1, 2015 Minnesota regulations will require all licensed minnow dealers and their employees (except those who only sell minnows at a retail location) to successfully complete AIS training each year.

Some core stakeholder group members suggested that the DNR could require anglers harvesting minnows in infested waters to tag their gear and equipment in the same way as licensed minnow dealers working in listed infested waters, or to get a permit or a special endorsement on their angling licenses. DNR staff indicated that the DNR does not currently have statutory authority to permit anglers to harvest bait from infested waters for personal use. They also noted that additional DNR staff would likely be required to implement and manage a permit or license program.

Finally, some group members suggested that anglers should be required to use minnows on the same water body where they were caught; this is currently a requirement for anglers harvesting minnows under Minnesota Statutes, section 84D.03, subdivision 3, paragraph (b), clause (3) item (i), and is difficult to enforce. Expanding this requirement statewide would pose additional enforcement challenges. Some group participants noted that few anglers take store-bought live bait with them off the water body because it is difficult to keep water at the access cold enough to keep the minnows healthy after leaving a water body. One participant mentioned that other states require that anglers have receipts for their live bait and the bait must be used within specified time and geographic limitations.

3. Harvest rough fish with cast nets

Concern: Catfish anglers would like to be able to use a cast net to harvest gizzard shad from infested rivers for personal use as bait. Currently, cast nets are not legal for use in Minnesota. In addition, Minnesota Statutes, section 84D.03, subdivision 3, paragraph (a) prohibits most non-commercial bait harvest from infested waters, and the DNR does not currently have statutory authority to permit anglers to use a cast net to harvest bait from infested waters for personal use.

Discussion: As proposed, this suggestion would not apply statewide. Implementing this change would require regulatory changes to allow the use of cast nets and to permit the use of cast nets for harvesting bait in listed infested waters.

A member of the core stakeholder group suggested that DNR should develop a permit that would allow the harvest of gizzard shad from the Mississippi and St. Croix rivers (listed infested waters) using a cast net for personal use as bait. That permit could have conditions necessary to prevent the spread of AIS, such as only using the gizzard shad on the same body of water where they were harvested and while still on that body of water.

The group then discussed the idea that gizzard shad harvested with a cast net for use as bait should be used on the same body of water where they were harvested and while still on that body of water. This is important for several reasons. First, gizzard shad are not defined as minnows outside of the Minnesota/Wisconsin border waters. Because gizzard shad are not defined as minnows outside of these waters, persons cannot legally transport gizzard shad live within the state. Next, young bighead carp, a prohibited invasive fish species, look very similar to gizzard shad. Therefore, transporting gizzard shad live off the body of water where they were harvested would increase the risk of spreading AIS. Also, gizzard shad are susceptible to viral hemorrhagic septicemia (VHS) virus. Because they are susceptible to this virus, in order to be used as bait on another body of water than where caught they would need to be harvested from a water body which has a current negative fish health certification showing no presence of VHS in the past year; or be preserved and labeled under a valid bait preservation permit. Finally, gizzard shad do not hold up well to freezing. For these reasons, the participants agreed that the gizzard shad should be used where caught and not be transported off the source water body.

Some participants suggested that if cast nets were made legal for personal harvest they should also be an option for commercial harvesters. Core stakeholder group members discussed the effectiveness of cast nets. Many harvesters thought that cast nets would work best in murky waters where baitfish concentrate in high densities. Participants were doubtful that cast nets would be useful for harvesting minnows in clear or flowing waters. Some participants also mentioned that certain types of cast nets could have negative impacts on individual fish. For example, the net could rub off scales and disrupt the fish's slime coat, leaving it susceptible to infection by bacteria or fungus.

Cast nets are currently not a legal gear type in Minnesota. However, core stakeholder group members thought that the risk of AIS transfer with cast nets could be managed with a permitting and tagging system similar to that used for commercial minnow dealers harvesting from infested waters. The DNR would have to secure additional resources to administer an additional permit and tagging program. Because cast nets have not been used in the state, the DNR would first need to perform additional research to better understand the effects of cast nets on fisheries resources, for example, the bycatch rate of this gear type.

One participant suggested broadening this proposal to include mooneye, sheepshead, and suckers. The core stakeholder group did not discuss this suggestion. While AIS related risks

could probably still be managed with a permitting and tagging system, broadening this proposal could have additional effects on fisheries resources.

4. Closed harvest season for waters listed as infested with zebra mussels

Concern: Water bodies listed as infested with zebra mussels are closed to minnow harvest during a summer season defined in the minnow dealer permit. In some cases the closed harvest season overlaps with opportunities to harvest minnows.

Discussion: The closed harvest season falls during the time of year when microscopic zebra mussel larvae (veligers) are present in large numbers. It was originally implemented to reduce the risk of zebra mussel spread via veligers moved in water used for minnow transport. Minnow dealers requested that the closed season be made shorter or eliminated altogether. The DNR believes that eliminating the closed season altogether would increase the risk of AIS introduction or spread.

The core stakeholder group suggested that the DNR could develop protocols that would allow bait harvest to continue during more of the summer months. Some participants suggested that salt or products like Zequanox® could be used to decontaminate equipment and water where minnows were held, so that even if veligers were present they would be killed. Others pointed out that some minnow species may not survive the concentrations of salt necessary to kill veligers. It was suggested that someone should conduct research to determine the lowest concentration of salt that would be effective against veligers and then determine if that concentration is harmful to minnows. The group also discussed the disposal of water that had been treated with salt or other disinfectants and whether additional permits or best management practices would need to be developed to address treated water disposal. Further research is needed to determine effective methods of decontamination.

Harvesters also suggested that the DNR should open and close the harvest season based on actual water temperature, rather than use fixed dates determined by average water temperature. Some participants suggested the development of a system that would monitor the temperature in water bodies listed as infested with zebra mussels (or a proxy for the water temperature, such as air temperature, for certain water bodies). Additional research to examine the presence and density of veligers at different temperatures is needed to determine an appropriate temperature threshold for Minnesota lakes.

Some harvesters pointed out that the use of a lake box, grader, or mesh strainer could filter out adult zebra mussels and plant fragments with attached zebra mussels, thereby reducing those risks. The risk of small zebra mussels and veligers being transported in the water would remain, but some participants suggested that the risk is so small that DNR should consider eliminating the closed season in waters listed as infested with zebra mussels.

Some core stakeholder group members suggested that minnows harvested from waters listed as infested with zebra mussels should be used only on the source water body or on other waters listed as infested with zebra mussels. Both these options would be difficult to enforce and would require development of a system to document the source of minnows.

This discussion also relates to the desire to remove tags and reuse gear and equipment in other water bodies (see recommendation 8). There are trade-offs between a scenario in which harvesters would decontaminate water to kill veligers and continue using tagged gear and equipment in waters listed as infested with zebra mussel only, and a scenario in which harvesters would decontaminate gear and equipment to be used in other water bodies not listed as infested with zebra mussels during the closed harvest season. If the closed harvest season could be minimized, there may be less of a need to develop protocols to remove tags and decontaminate gear and equipment for use in other waters.

5. Authority to permit transportation of invasive species for decontamination

Concern: Minnow dealers may not currently use traps to harvest minnows from water bodies listed as infested with zebra mussels. Traps are a preferred gear type for licensed minnow dealers during the spring spottail shiner minnow harvest. As increasing numbers of water bodies are listed as infested with zebra mussels, minnow dealers are losing more trapping opportunities.

Discussion: Core stakeholder group members suggested that the DNR should develop a decontamination protocol for traps so that they can be used in water bodies listed as infested with zebra mussels. However, the DNR would need additional information on the feasibility of decontaminating traps to sufficiently reduce the risk of transporting and introducing zebra mussels with that gear. If traps would need to be transported to a location away from the water access to be decontaminated, the DNR would also need to seek a statutory change to authorize permits to allow the transportation of prohibited AIS for decontamination.

This discussion also relates to the desire to remove tags and reuse gear and equipment (topic 9 on this list).

6. Permitting minnow harvest in waters listed as infested with spiny waterflea

Concern: The DNR only issues permits to harvest minnows from three water bodies listed as infested with spiny waterflea: Lake of the Woods, Rainy River and Lake Mille Lacs.

Discussion: Core stakeholder group members suggested that the DNR should explore protocols that would allow minnows to be harvested from all waters listed as infested with spiny waterflea. Live minnows harvested in waters listed as infested with spiny waterflea are currently subject to a 48-hour holding period (during the time period when resting eggs are

present) to allow any resting eggs to be purged from the intestinal tract before they are used in non-spiny waterflea infested waters. Some participants suggested that non-local harvesters could freeze minnows for a specific time period prior to sale outside of the existing containment and quarantine zones to eliminate the risk of transferring any spiny waterflea resting eggs present within the intestinal tract. Participants also requested that the DNR consider adding permit conditions for methods to properly dispose of water that came from waters listed as infested with spiny waterflea. Currently, permit conditions require minnow dealers to dispose of all water used to transport minnows from infested waters on the ground (pervious surface) at least 300 feet from any natural waters or artificial ponds.

The core stakeholder group also acknowledged the difficulties of developing protocols for live minnows harvested from spiny waterflea infested water bodies. Because it would be almost impossible to ensure that minnows sold at retail are used in the same water body where they were harvested, all minnows would need to be held prior to sale to allow for purging during the time period when spiny waterflea resting eggs are present. However, holding minnows may not be possible for all harvesters. There would need to be very specific requirements placed on holding to ensure that resting eggs would sink to the bottom of the holding tank, below a very fine mesh screen, to avoid re-consumption. In order to simplify operations, have statewide consistency and ensure enforceability, it is preferable to require that all minnows harvested from spiny waterflea infested waters be frozen prior to sale during the period when resting eggs are present. The DNR would have to develop a protocol that would not increase risk and would be enforceable. The protocol should incorporate the best available scientific knowledge about freeze time required to inactivate spiny waterflea resting eggs.

7. Policies for different user groups working in listed infested waters

Concern: Different user groups using the same, infested water bodies are subject to different rules and regulations.

Discussion: Some core stakeholder group members suggested that the DNR should develop consistent policies that apply to all user groups that use infested waters, including hunters, boaters, anglers, trappers and individuals spearing suckers. Because statute currently treats these groups differently, the DNR would need to seek changes to state law in order to completely implement this suggestion. Statutes and rules are complex and revising all the DNR's *existing* authorities to make consistent policies for all user groups is outside the scope of this project.

Policies to govern different user groups were developed based on the different ways those people use the waters and the different risks of AIS movement posed by their activities. Therefore it would not be appropriate in all cases to harmonize policies for multiple user

groups. However, the DNR could work to ensure that any new policies are better coordinated as they are developed.

8. Reuse of tagged gear and equipment

Concern: Gear and equipment tagged for use in listed infested waters (not including waters listed with only Eurasian watermilfoil or flowering rush) cannot be used elsewhere for the remainder of the license year. Because the harvest period may only last for a few weeks, this policy can result in gear and equipment sitting idle for long periods. Core stakeholder group members mentioned that waders are susceptible to dry rot if they sit unused for long periods of time, so current policies result in the need for frequent replacement of waders.

Discussion: The core stakeholder group requested that the DNR develop decontamination protocols to allow gear and equipment tagged for use in listed infested waters to be decontaminated, untagged, and reused elsewhere. Protocols might need to be different depending on which AIS are present in the infested water where the gear and equipment has been used. Some core stakeholder group members suggested that DNR prioritize the development of decontamination protocols for the AIS that have the greatest ecological and economic impacts.

The core stakeholder group discussed that a protocol allowing decontamination and reuse of gear and equipment would also need to include steps for re-tagging gear and equipment. DNR staff would need to dedicate additional time to re-tagging gear and equipment for harvesters in their area. Bait harvesters would have to coordinate with staff and make additional trips to DNR offices to have gear and equipment re-tagged. This aspect of implementation would make operations more complex for both harvesters and for DNR staff; as such, it would not meet the criteria of simplifying operations. Some group members suggested that other persons could be authorized to tag bait harvesting equipment (for example, staff at deer registration stations) in order to reduce the burden on DNR staff.

Bait harvesters also discussed the possibility that more frequent tagging may require the cost of licenses to increase. However, most minnow dealers present at the core stakeholder group meeting expressed a willingness to pay an increased fee if it meant greater access to gear and equipment throughout the year.

The DNR would also need to develop a decontamination protocol that would effectively reduce the risk of transporting AIS. DNR staff pointed out that many internal DNR protocols require equipment that is used on infested waters to be tagged, and that tagged equipment is not reused on other water bodies.

In order to implement this recommendation in a way that does not increase the risk of AIS movement, the DNR could allow decontamination and re-tagging of non-felt-soled waders so

they can be reused in other types of water bodies. The protocol would include requirements for decontamination of waders, requirements for recording tag-removal events and requirements for re-tagging waders. DNR staff would supervise removal of tags and re-tagging of gear and equipment to ensure waders have been effectively decontaminated. Harvesters could have tags removed and replaced once during the license year (after the harvest season has closed) and this option would be restricted to non-felt soled waders tagged for use in waters listed as infested with zebra mussel.

9. Alternative decontamination methods

Concern: Current methods for decontaminating bait tanks, such as high-pressure, hot-water wash, can damage equipment.

Discussion: Core stakeholder group members mentioned that other methods, such as using hydrogen peroxide, may be effective for decontamination but are gentler on equipment.

Appendix 2: Discussion of Other Topics with Stakeholder Groups

During the course of the core stakeholder group's work together in 2014, participants discussed many topics related to minnow harvest and infested waters. We have recorded below some of those discussions.

Discussions that did not lead to a recommendation

Permit length

One core stakeholder group member suggested reducing the length of text on permits issued to licensed minnow dealers to allow the harvest of minnows in listed infested waters by removing permit conditions that repeat requirements that are already in statute and/or rule. The group discussed the possibility of such a revised permit, which could include references to the relevant statutes and rules so that permittees can reference those policies directly. However, most core stakeholder group participants were not supportive of the idea of changing the permit length. Indeed, most group members expressed a preference for the current permits which include statute, rule and permit condition requirements, even if it makes the list of permit conditions longer due to the ease of having all applicable requirements in one easily accessible location.

Permit communication

Some harvesters have suggested that the DNR improve and simplify communication of permit conditions, rules, and statutes. However, the DNR already communicates policies, including relevant policy changes, at least annually via the DNR website and letters to permittees. The core stakeholder group did not generate a specific suggestion for improvement with respect to this topic.

Permit conditions

One core stakeholder group participant suggested that DNR should create policies that would apply to all AIS to simplify bait harvest permits. Because some permit conditions were developed to address the risk of spreading different AIS due to a unique characteristic or life stage, implementing this suggestion would require a review of all risk-reducing measures and an assessment of which could be applied to more than one type of infested water without increasing the risk of making operations in other types of infested waters more complicated.

One core stakeholder group participant suggested that DNR should base more of the policies governing bait harvest in infested waters on permit conditions instead of statute because permit conditions are easier to change. However, because existing Minnesota state law prescribes requirements for bait harvest in infested waters, implementing this suggestion

would require a major statutory revision. Implementing this suggestion may make operations more complicated for harvesters, because permit conditions could be more easily changed from year to year.

Suggestions and concerns that the DNR is currently taking steps to address

Post policies online and advertise changes to policies

Core stakeholder group participants suggested developing a website where all of the most recent rules, laws, and infested waters are available. The DNR already hosts such a website and advertises the URL in the annual minnow dealer license renewal letter. The DNR also calls attention to policy changes in the license renewal letter and again at the in-person AIS training sessions for minnow dealers. Beginning in 2015, the DNR will also begin utilizing GovDelivery to send out notifications of change and important reminders to licensees who opt in.

Tribal communications

The group discussed the need to communicate, coordinate, and work cooperatively with tribes on issues related to minnow harvest in listed infested waters. DNR regional staff regularly engages with tribal nations on these issues. A tribal representative also serves on DNR's AIS Advisory Committee.[5] In addition, in 2013, Minnesota Governor Dayton issued an executive order (13-10) which directs state agencies to implement tribal consultation policies. In 2014, the MNDNR adopted operational order 129, which sets out policies for the agency's relationship with tribal nations.

Inter-jurisdictional communications

The group suggested that the DNR communicate regulations to neighboring jurisdictions so that neighboring states are aware of current policies and regulations that apply in Minnesota. DNR Fisheries already discusses issues related to minnow harvest in waters listed as infested with AIS at annual border water meetings.

Mandatory AIS training

Group participants suggested that DNR make AIS training mandatory for all licensed minnow dealers. Beginning March 1, 2015, annual AIS training will be required for the following people: all licensed minnow dealers; all licensed minnow dealer employees (except those who only sell minnows at a retail location); Minnesota Residents under age 18 taking, selling, or transporting

[5] More information about the AIS Advisory Committee's membership and meetings is available here: http://www.dnr.state.mn.us/aisadvisory/index.html.

for sale leeches; all commercial fishing licensees; and all commercial fishing licensee apprentices.

Support the use of HACCP

Some core stakeholder group members suggested that DNR support the use of hazard analysis and critical control points (HACCP) to reduce the risk of minnow harvest operations. The DNR does support the use of the HACCP approach for reducing the risk of AIS transfer during bait harvest activities. The video, "From Net to Sale," which describes the HACCP approach for bait harvesters, is part of the DNR's required training for bait dealers working in infested waters. However, the DNR must also implement and enforce existing statutes and rules related to bait harvest in infested waters.

Transport aquatic plants with equipment being transported for cleaning

The group suggested that the DNR should allow minnow dealers to remove aquatic plants stuck on traps at their place of business. Each year, the DNR issues a general permit to all minnow dealer, aquaculture, and commercial fishing licensees. This permit authorizes the transport of aquatic plants (macrophytes) attached to various minnow harvest, aquaculture, and commercial fishing equipment from state waters to a cleaning location specified on the Notification and Verification Form.

Discussions outside the scope of this project

The DNR recognizes that there are many important issues related to minnow harvest and to AIS-infested waters. Because the project described in this report was intended to generate specific recommendations for change to policies and regulations governing minnow harvest in infested waters, some discussions could not be pursued further within the scope of this project. We have recorded those issues below to reflect the breadth of concerns and suggestions expressed by the core stakeholder group.

Core stakeholder group participants suggested a number of ways in which the DNR could improve outreach about AIS prevention, including:

- Increase awareness of AIS among other user groups (e.g., anglers, motorized, non-motorized, seaplanes, hunters, wakeboard boats);
- Educate K-12 students about AIS (one group member offered the Nab the Aquatic Invader program as an example);
- Educate non-resident resource users about AIS and about Minnesota's laws and regulations (possibly in partnership with Explore Minnesota); and
- Promote the use of Turn in Poachers for AIS violations.

Core stakeholder group participants suggested that the DNR:

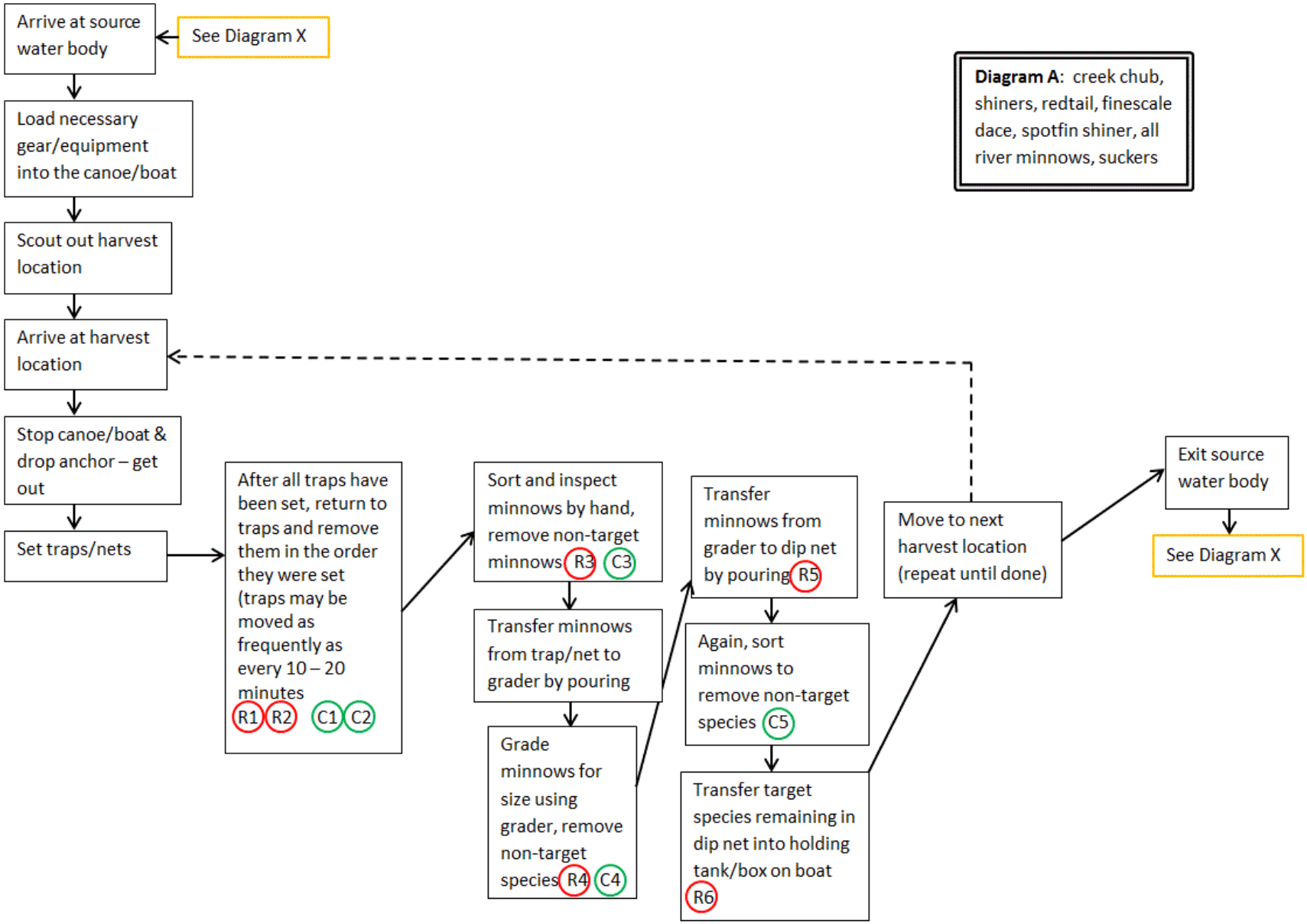
- Convene a follow-up group to discuss policies related to VHS, including VHS testing requirements;
- Convene a follow-up group to discuss all minnow regulations;
- Redefine minnows in rules and statutes to separate leeches from fishes;
- Let local fisheries offices make more changes to policies in their area; and
- Consider revising classifications of AIS, in particular consider listing spiny waterflea as a prohibited AIS (it is currently listed as a regulated AIS).

Appendix 3: Minnow Harvest Process Diagrams

The DNR consulted licensed minnow dealers and anglers who harvest bait for personal use to determine what methods are being used to harvest minnows. The core stakeholder group met in September and October 2014 to develop minnow harvest process diagrams and assess the risks associated with each minnow harvest processes.

The group developed process diagrams to characterize the activity along with its potential risks and corrective actions. In all cases, the general process is listed in black, while risks are listed in red and corrective actions are listed in green. Wherever dashed lines appear, the activity may not always occur. Although the group attempted to analyze many minnow harvest processes, the DNR recognizes that other processes not covered by these diagrams exist. These diagrams are generalized based on a subset of minnow harvest processes, and may not apply to every minnow harvest process.

Appendix 3a: Process Diagram A



Appendix 3a: Process Diagram A

Risk

R1: The anchor could act as a vector for the transfer of aquatic plants, sediment, and invertebrates attached to aquatic plants or in the sediment. Anchor lines can also have AIS tangled in them.

R2: The traps could act as a vector for the transfer of aquatic plants, sediment, and invertebrates attached to aquatic plants or in the sediment. Depending on how long traps are set; they could also have eggs from AIS (example – snails) on them. Late summer/fall use can potentially have spiny water flea with resting eggs snagged onto trap lines.

R3: potential to transfer non-target species at this point

R4: potential to transfer non-target species at this point

R5: potential to transfer non-target species at this point

R6: potential to transfer non-target species at this point

Corrective Action

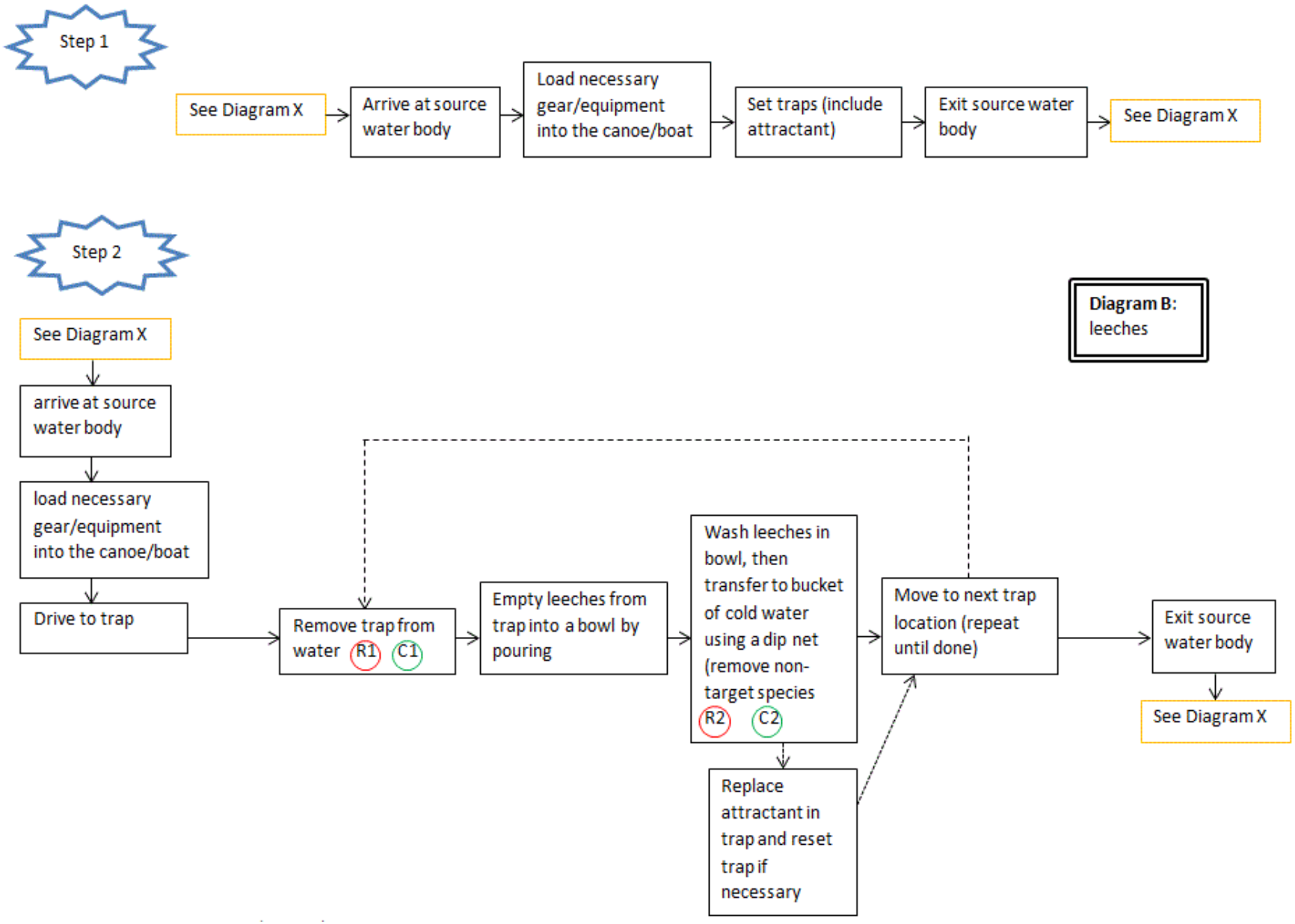
C1: Remove aquatic plants and sediment from anchor before bringing the anchor into the canoe/boat. Have alternate line that can be switched out before using anchor in different water.

C2: Remove aquatic plants and sediment from traps before bringing the traps into the canoe/boat. Depending on AIS status, traps may need to be dried to ensure AIS life stages are not moved.

C3: hand sort minnows to minimize the risk of transferring non-target species

C4: visually scan minnows to minimize the risk of transferring non-target species

C5: visually scan minnows to minimize the risk of transferring non-target species



Appendix 3b: Process Diagram B

Risk

R1: The traps could act as a vector for the transfer of aquatic plants, sediment, and invertebrates attached to aquatic plants or in the sediment. Traps may also have eggs of AIS (example – faucet snail) on them, as well as tiny snails caught among bait.

R2: potential to transfer non-target species at this point

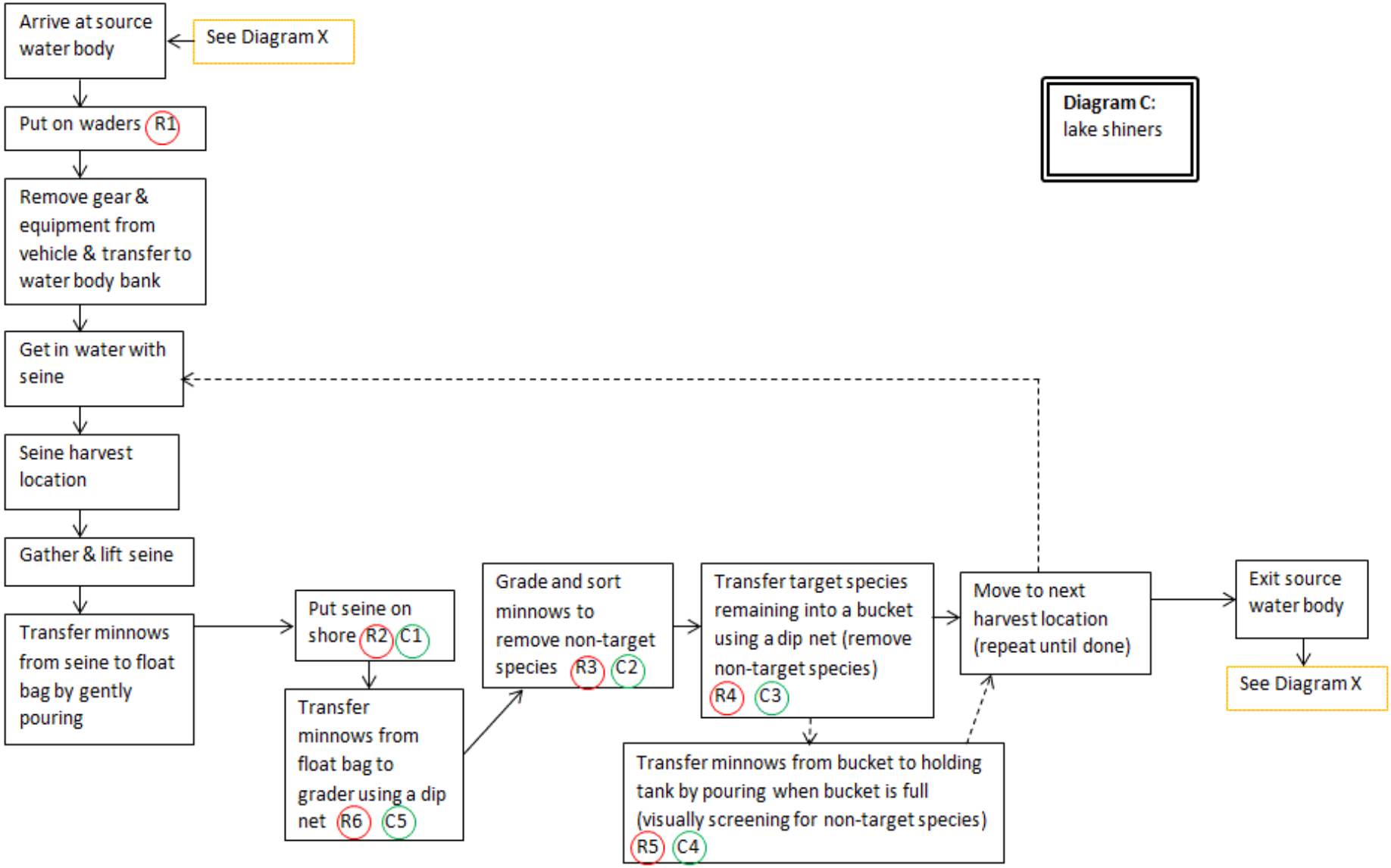
R3: Waders, canoes and other equipment (such as anchors, lines, etc.) all have potential to have AIS attached.

Corrective Action

C1: Remove aquatic plants and sediment from traps before bringing the anchor into the canoe/boat. Traps should be dried or cleaned prior to moving between waters.

C2: hand sort leeches to minimize the risk of transferring non-target species.

C3: Clean off all anchor lines, soles of waders and other gear. Wipe off all anchor lines (traps, canoes) to remove any AIS.



Appendix 3c: Process Diagram C

Risk

R1: The soles of waders (if felt soled) could act as a vector for the transfer of sediment and invertebrates.

R2: The seine could act as a vector for the transfer of aquatic plants, sediment, and invertebrates.

R3: potential to transfer non-target species at this point

R4: potential to transfer non-target species at this point

R5: potential to transfer non-target species at this point

R6: The float bag could be a vector for AIS attached, caught on or inside the bag

Corrective Action

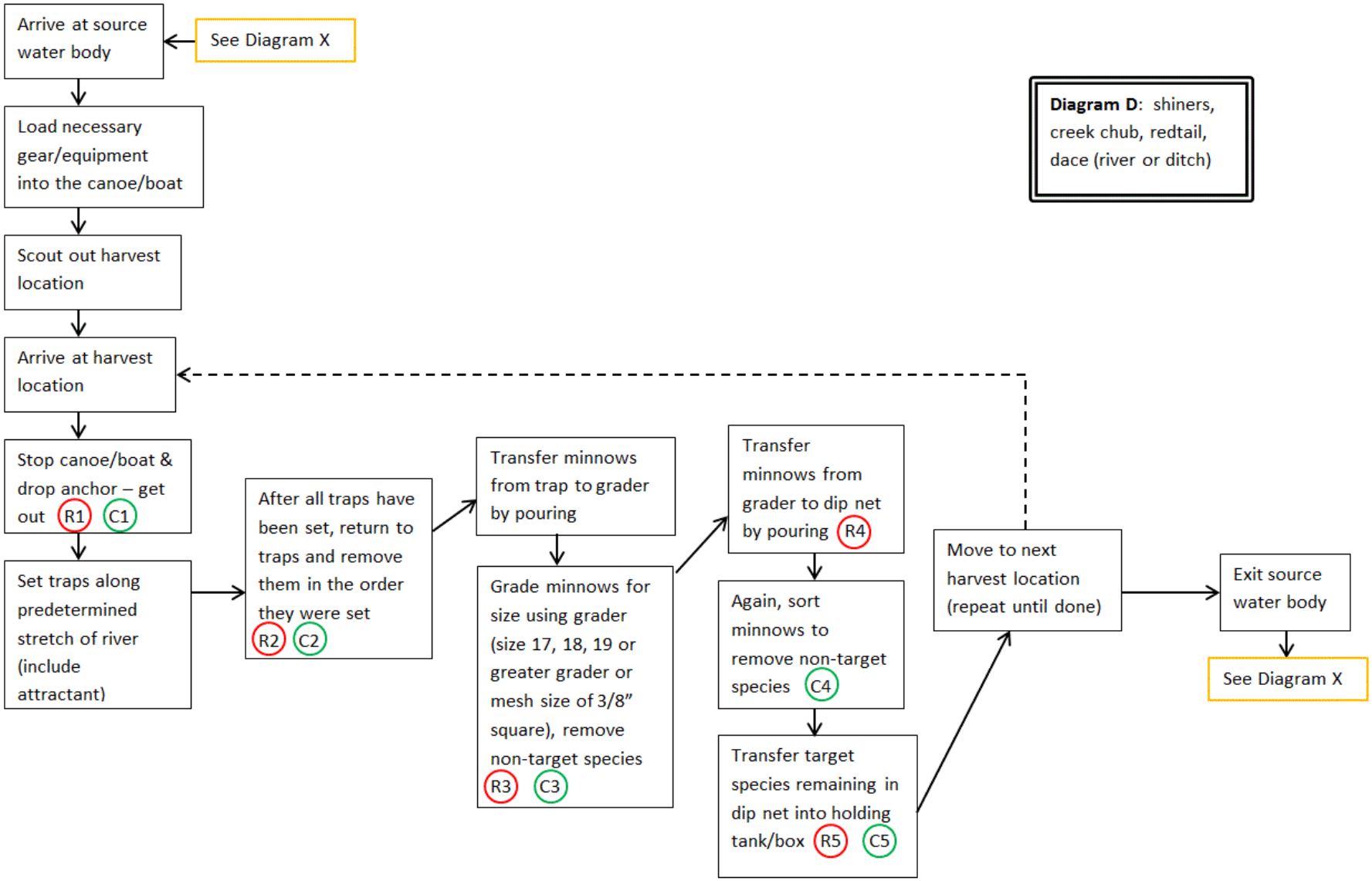
C1: Remove aquatic plants and sediment from seine before putting the seine on shore.

C2: hand sort minnows to minimize the risk of transferring non-target species

C3: visually screen minnows to minimize the risk of transferring non-target species

C4: visually screen minnows to minimize the risk of transferring non-target species

C5: Float bag should be cleaned of all visible AIS – in some AIS waters, bag and other equipment should be dried prior to use in other waters.



Appendix 3d: Process Diagram D

Risk

R1: The anchor could act as a vector for the transfer of aquatic plants, sediment, and invertebrates attached to aquatic plants or in the sediment. Anchor lines can also have AIS tangled in them.

R2: The traps could act as a vector for the transfer of aquatic plants, sediment, and invertebrates attached to aquatic plants or in the sediment. Depending on how long traps are set; they could also have eggs from AIS (example – snails) on them. Late summer/fall use can potentially have spiny water flea with resting eggs snagged onto trap lines.

R3: potential to transfer non-target species at this point

R4: potential to transfer non-target species at this point

R5: potential to transfer non-target species at this point

Corrective Action

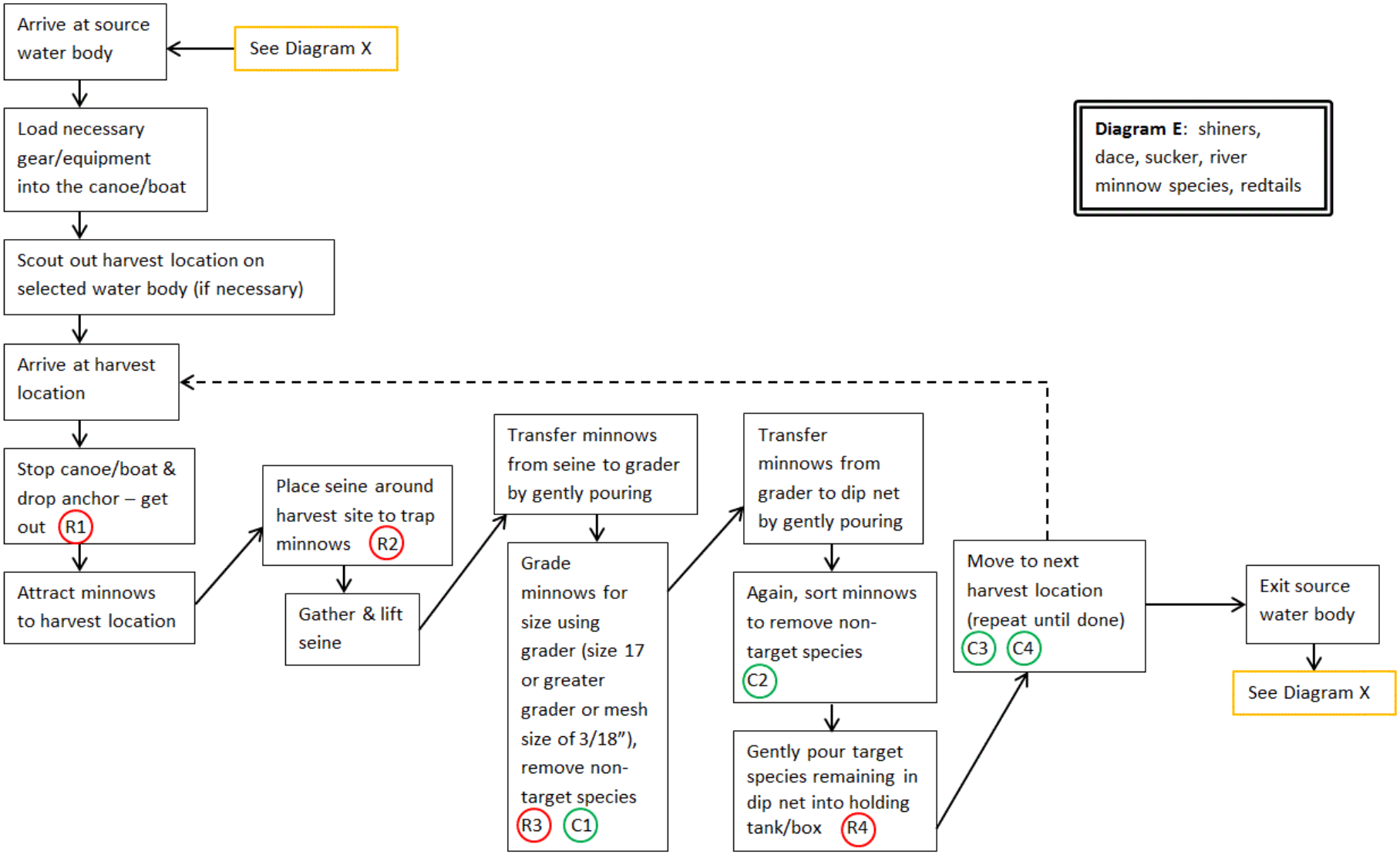
C1: Remove aquatic plants and sediment from anchor before bringing the anchor into the canoe/boat. Have alternate line that can be switched out before using anchor in different water.

C2: Remove aquatic plants and sediment from traps before bringing the traps into the canoe/boat. Depending on AIS status, traps may need to be dried to ensure AIS life stages are not moved.

C3: hand sort minnows to minimize the risk of transferring non-target species

C4: visually scan minnows to minimize the risk of transferring non-target species

C5: visually scan minnows to minimize the risk of transferring non-target species



Appendix 3e: Process Diagram E

Risk

R1: The anchor could act as a vector for the transfer of aquatic plants, sediment, and invertebrates attached to aquatic plants or in the sediment. Anchor lines can also have AIS tangled in them.

R2: The seine could act as a vector for the transfer of aquatic plants, sediment, and invertebrates attached to aquatic plants or in the sediment. AIS may also be entangled in the seine

R3: potential to transfer non-target species at this point

R4: potential to transfer non-target species at this point

Corrective Action

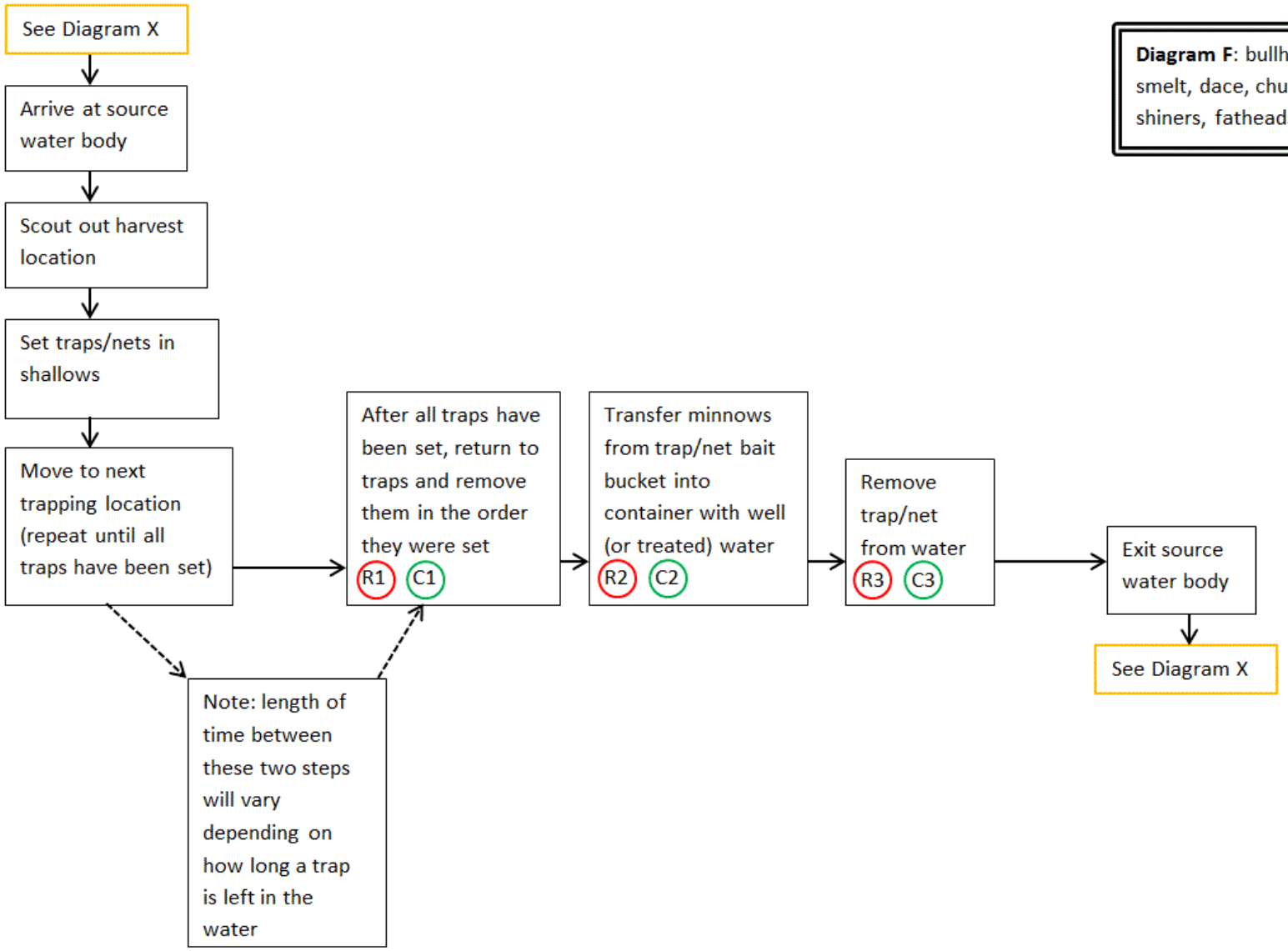
C: Remove aquatic plants and sediment from anchor before bringing the anchor into the canoe/boat. Have alternate line that can be switched out before using anchor in different water.

C1: hand sort minnows to minimize the risk of transferring non-target species

C2: visually scan minnows to minimize the risk of transferring non-target species

C3: Remove aquatic plants and sediment from anchor before bringing the anchor into the canoe/boat.

C4: Remove aquatic plants and sediment from seine before moving to the next harvest location. Dry the seine prior to use in different waters depending on AIS species.



Appendix 3f: Process Diagram F

Risk

R1: The traps could act as a vector for the transfer of aquatic plants, sediment, and invertebrates attached to aquatic plants or in the sediment. Depending on how long traps are set; they could also have eggs from AIS (example – snails) on them. Late summer/fall use can potentially have spiny water flea with resting eggs snagged onto trap lines.

R2: potential to transfer non-target species at this point

R3: The traps could act as a vector for the transfer of aquatic plants, sediment, and invertebrates attached to aquatic plants or in the sediment.

R: If boat/canoe is used with anchor, anchors and lines can be a vector for AIS movement.

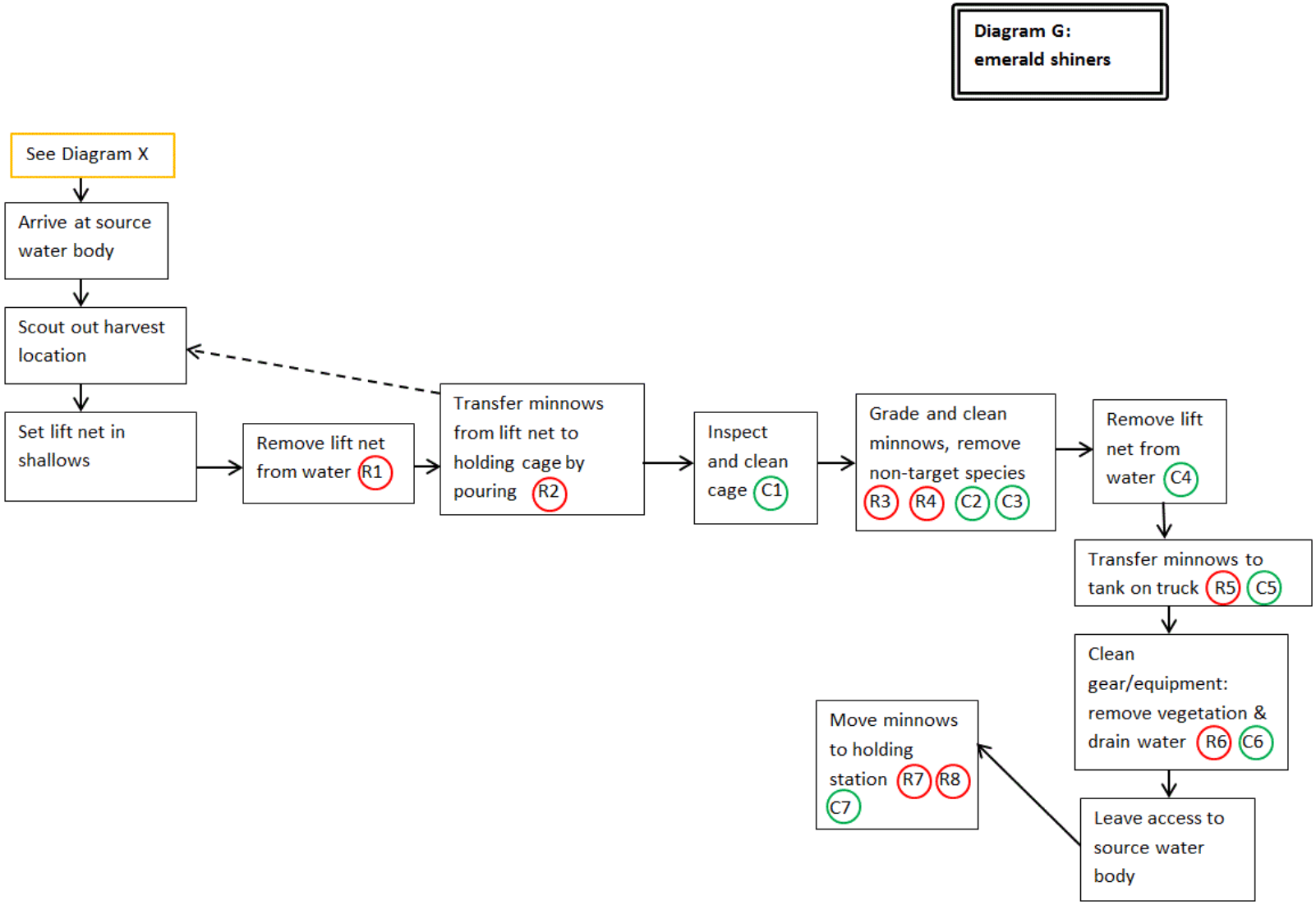
Corrective Action

C1: Remove aquatic plants and sediment from traps before bringing the traps into the boat (if used). Depending on AIS status, traps may need to be dried to ensure AIS life stages are not moved.

C2: hand sort minnows to minimize the risk of transferring non-target species

C3: Remove aquatic plants and sediment from traps.

C: Clean all aquatic plants and sediment from anchors and lines. Have alternate anchor line for use in different waters.



Appendix 3g: Process Diagram G

Risk

R1: The lift net could act as a vector for the transfer of aquatic plants, sediment, and invertebrates attached to aquatic plants or in the sediment. Depending on how long lift nets are set; they could also have eggs from AIS (example – snails) on them. Late summer/fall use can potentially have spiny water flea with resting eggs snagged onto trap lines.

R2: The holding cage could act as a vector for the transfer of aquatic plants, sediment, and invertebrates attached to aquatic plants or in the sediment. Depending on how long holding cages are in the water, they could also have eggs from AIS (example – snails) on them. Late summer/fall use can potentially have spiny water flea with resting eggs snagged onto trap lines.

R3: The grader could act as a vector for the transfer of aquatic plants, sediment, and invertebrates attached to aquatic plants or in the sediment.

R4: Potential to transfer non-target species at this point

R5: Potential to transfer non-target species at this point

R6: Insufficiently draining water or cleaning gear/equipment prior to leaving the source water body could potentially transfer AIS

R7: Potential to transfer non-target species at this point

R8: Potential to have spiny waterflea resting eggs in the intestines of the minnows

Corrective Action

C1: Remove aquatic plants and sediment from holding cage before bringing the traps away from the source water body. Depending on AIS status, the holding cage may need to be dried to ensure AIS life stages are not moved.

C2: Remove aquatic plants and sediment from grader before bringing the traps away from the source water body. Depending on AIS status, the grader may need to be dried to ensure AIS life stages are not moved.

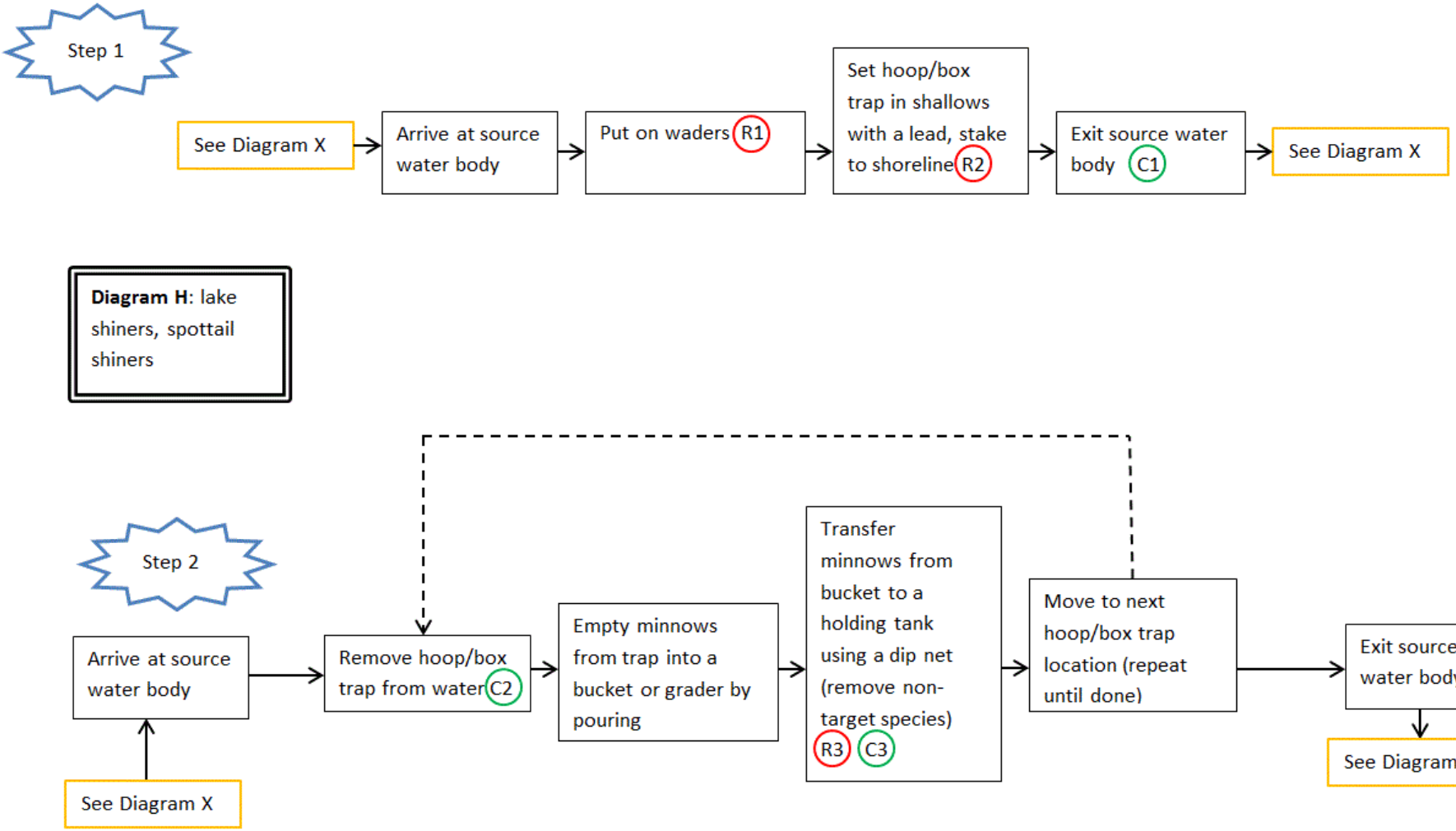
C3: hand sort minnows to minimize the risk of transferring non-target species

C4: Remove aquatic plants and sediment from lift net before bringing the traps away from the source water body. Depending on AIS status, lift nets may need to be dried to ensure AIS life stages are not moved.

C5: visually screen minnows to minimize the risk of transferring non-target species

C5: Draining water and cleaning gear/equipment prior to leaving the source water body reduces the risk of transferring AIS

C6: Visually screening minnows as they are transferred will provide another opportunity to remove any non-target species that were missed previously



Appendix 3h: Process Diagram H

Risk

R1: waders (especially felt-soled waders) could act as a vector for the transfer of sediment and invertebrates

R2: the traps could act as a vector for the transfer of aquatic plants, sediment, and invertebrates attached to aquatic plants or in the sediment. Depending on how long traps are set; they could also have eggs from AIS (example – snails) on them. Late summer/fall use can potentially have spiny water flea with resting eggs snagged onto trap lines.

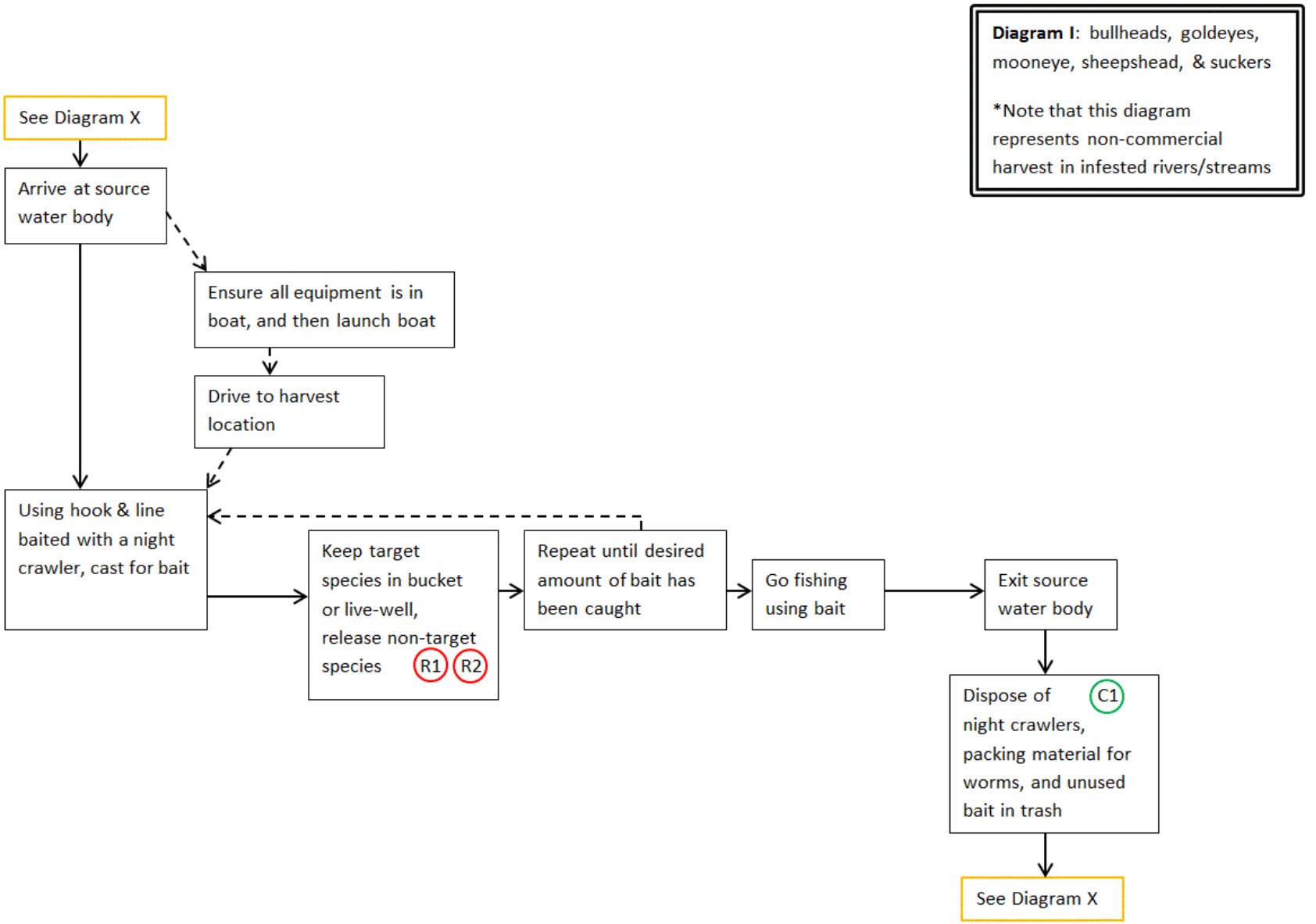
R3: potential to transfer non-target species at this point

Corrective Action

C1: ensure that waders are clean prior to leaving source water body

C2: remove aquatic plants and sediment from traps. Depending on AIS status, traps may need to be dried to ensure AIS life stages are not moved.

C3: hand sort minnows to minimize the risk of transferring non-target species



Appendix 3i: Process Diagram I

Risk

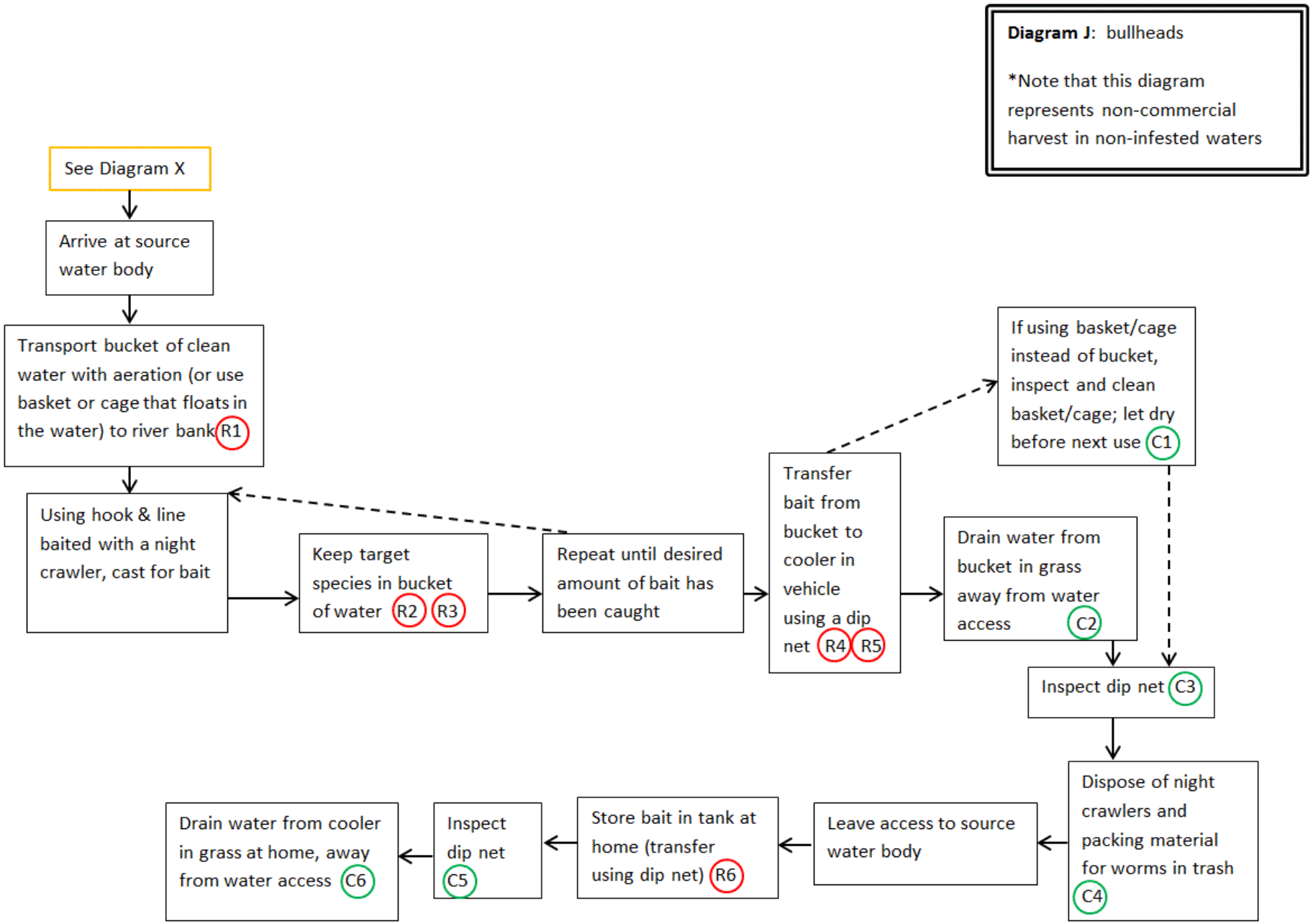
R1: potential to misidentify species and unintentionally keep non-target species

R2: minnow could have spiny waterflea resting eggs in its intestines

Corrective Action

C1: dispose of unwanted night crawlers, packing material for worms, and unused bait in the trash – eliminate possibility of unintentionally transferring non-target species

Appendix 3i: Process Diagram I



Appendix 3j: Process Diagram J

Risk

R1: the float basket/cage could act as a vector for the transfer of aquatic plants, sediment, and invertebrates

R2: potential to misidentify species and unintentionally keep non-target species

R3: minnow could have spiny waterflea resting eggs in its intestines

R4: the dip net could act as a vector for the transfer of aquatic plants, sediment, and invertebrates

R5: potential to transfer non-target species at this point

R6: the dip net could act as a vector for the transfer of aquatic plants, sediment, and invertebrates

Corrective Action

C1: remove aquatic plants and sediment from float basket/cage and allow to dry prior to re-use

C2: drain water in grass away from water access to ensure that AIS will not enter water

C3: remove aquatic plants and sediment from dip net and allow to dry prior to re-use

C4: dispose of unwanted night crawlers and packing material for worms in the trash – eliminate possibility of unintentionally transferring invasive worms

C5: remove aquatic plants and sediment from dip net and allow to dry prior to re-use

C6: drain water in grass away from water access to ensure that AIS will not enter water

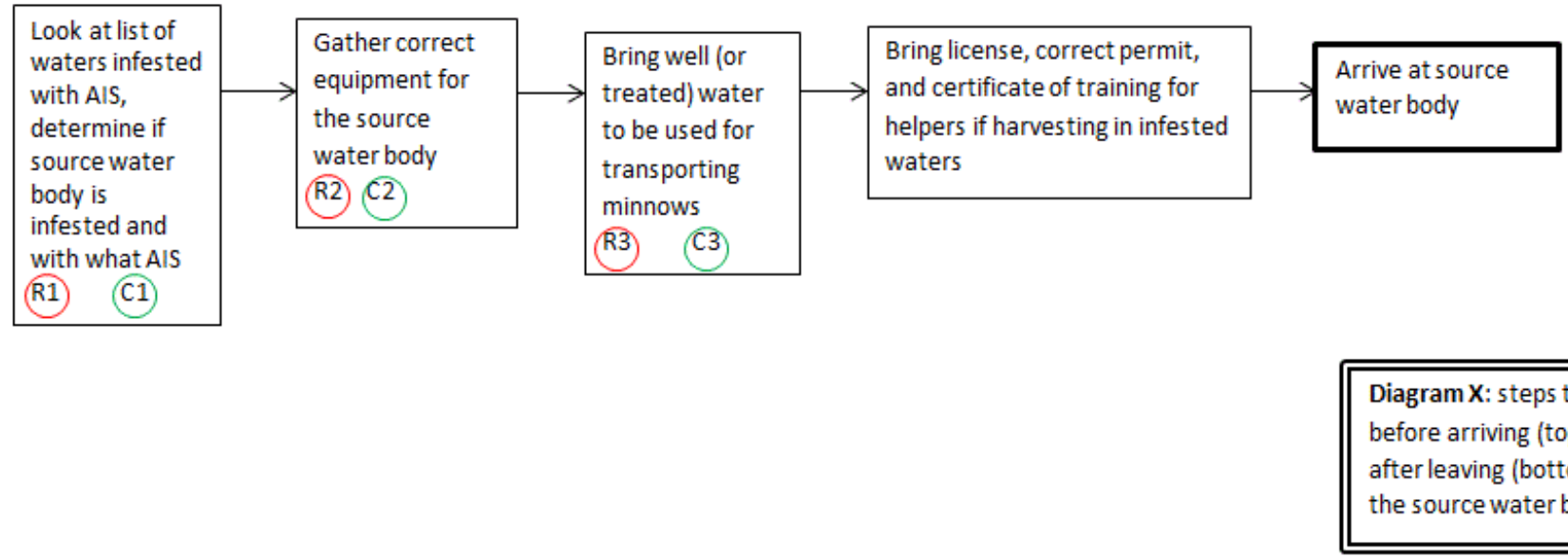


Diagram X: steps taken before arriving (top) and after leaving (bottom) the source water body

Risk

R1: Potential to work in an infested water body without knowing it is infested

R2: Potential to use the wrong "type" (wrong set of tags, or untagged) of gear/equipment for the water to be harvested

R3: Using water from the harvest location to transport minnows could potentially transfer AIS

R4: Using water from the harvest location to transfer minnows could potentially spread AIS

R5: Potential to transfer non-target species at this point

R6: Insufficiently draining water or cleaning gear/equipment prior to leaving the source water body could potentially transfer AIS

R7: Potential to transfer non-target species at this point

R8: Potential to have spiny waterflea resting eggs in the intestines of the minnows

Corrective Action

C1: Check the list of waters infested with AIS prior to a bait harvest trip to determine if the waters to be harvested during that trip are infested and if so, what they are infested with.

C2: Consciously loading each piece of gear/equipment to be used during harvest trip after checking the list of waters infested with AIS to determine status of water bodies to be harvested during trip will ensure that correct gear/equipment is used.

C3: Bringing well (or treated) water to be used for transporting minnows greatly reduces the potential for AIS to be transferred along water from the harvest location.

C4: Using well (or treated) water from the truck to transfer minnows greatly reduces the potential for AIS to be transferred along water from the harvest location.

C5: Draining water and cleaning gear/equipment prior to leaving the source water body reduces the risk of transferring AIS

C6: Visually screening minnows as they are transferred will provide another opportunity to remove any non-target species that were missed previously

C7: Ensuring that gear/equipment is decontaminated prior to reuse eliminates the risk of transferring AIS

Appendix 4: May 30, 2014 Questionnaire Results Summary

Participation

On May 30, 2014, the DNR sent a questionnaire to all 164 current minnow dealer licensees. Of those 164 licensees, 39 individuals also hold Aquatic Farm/Private Fish Hatchery licenses. The DNR received 74 responses from the questionnaire (45% response rate).

The questionnaire explained that the DNR had committed to undertake a process, involving stakeholders, to better understand the risk of spreading aquatic invasive species through minnow harvest activities. This process will aid in determining if existing regulations and permit conditions are adequately addressing the risks of spreading aquatic invasive species, or if changes should be considered.

This questionnaire was meant to inform the project described in this report, as well as to invite licensed minnow dealers to participation in the project's core stakeholder group.

<u>Response Summary</u>

The DNR asked the following questions (numbered 1-21 below). The 74 questionnaire responses are summarized below, with numbers and percentages of respondents, where applicable, recorded after each answer, and any additional notes recorded in bullets next to the relevant answer choice.

1. Do you currently hold a minnow dealer license?

Answer	Number of responses	Percent of responses	Additional notes
Yes	74	100%	*none*
No	0	0%	*none*

2. Are you an angler who harvests bait for personal use under your angling license?

Answer	Number of responses	Percent of responses	Additional notes
Yes	21	28.38%	• leeches
No	52	70.27%	• not yet
[No answer provided]	1	1.35%	*none*

3. Have you harvested minnows in designated infested waters during the past year?

Answer	Number of responses	Percent of responses	Additional notes
Yes	17	22.97%	• sucker eggs
No	57	77.03%	*none*
Don't know	0	NA	*none*

4. Do you think that Aquatic Invasive Species (AIS) could be introduced into Minnesota waters through the movement of live bait by anglers?

Answer	Number of responses	Percent of responses	Additional notes
Yes	41	55.41%	• If caught by common fishermen trapping or netting their own bait. All licensed bait dealers have training to know how to handle each situation. Common fisherman don't have training & don't care about anything except saving a dollar. • More by boats especially guides like (sic) who brag about fishing two invasive lakes then one not. Read his column in (sic). • If harvested by anglers • By uninformed anglers • Yes, but nearly all activities could, including animals. • If transporting from out of state. • Yes, but not likely.
No	22	29.73%	• Not with precautions. • Boat traffic is #1, dock lifts #2.
Don't know	10	13.51%	*none*
[No answer chosen]	1	1.35%	• Of course it's possible but we are all trying not to. I think it's more likely to spread naturally by nature.

5. Do you think that AIS could be introduced into Minnesota waters through the movement of bait harvest equipment between water bodies?

Answer	Number of responses	Percent of responses	Additional notes
Yes	34	45.95%	• If existing rules are not followed. Far greater risk by anglers, duck hunters, etc. Their waders, rods, buckets, etc. should have some regulations. • By untrained people. • If not treated. • Again, nearly all activities could, including animals. • Not likely if trappers know what to look for and dry the traps before resetting (or nets).
No	28	37.84%	• Not by licensed harvesters with proper training if following a HACCP plan. • I am very careful. • Not with precautions. • If taken care of properly.
Don't know	10	13.51%	• Not in small creeks & ponds in NE MN.
[No answer chosen]	3	4.05%	• Commercial – no; personal – yes. • Not very likely with all the precautions that have been implemented.

6. Do you know what a Hazard Analysis and Critical Control Point (HACCP) plan is?

Answer	Number of responses	Percent of responses	Additional notes
Yes	44	59.46%	• I have attended 3 HACCP seminars - very good practice.
No	20	27.03%	*none*
Don't know	9	12.16%	*none*
[No answer chosen]	1	1.35%	*none*

7. If you answered yes to question 5, do you have a HACCP plan, or another type of plan, in place to reduce the risk of AIS introductions?

Answer	Number of responses	Percent of responses	Additional notes
Yes	37	50%	• Every day - cleaning of boat, trailer, and equipment.
No	13	17.57%	*none*
Don't know	4	5.41%	*none*
[No answer chosen]	20	27.03	*none*

8. Are you generally aware of Minnesota Rules and Statutes that apply to bait harvest in designated infested waters?

Answer	Number of responses	Percent of responses	Additional notes
Yes	70	94.59%	*none*
No	2	2.70%	*none*
Don't know	1	1.35%	• Do not leech trap on infested waters.
[No answer chosen]	1	1.35%	• Basic, we do not harvest.

9. Do you know how to find Minnesota Rules and Statutes that apply to bait harvest in designated infested waters?

Answer	Number of responses	Percent of responses	Additional notes
Yes	67	90.54%	*none*
No	3	4.05%	*none*
Don't know	3	4.05%	• Don't trap on infested waters.
[No answer chosen]	1	1.35%	*none*

10. From what type of water body do you harvest bait (choose all that apply)?

Answer	Number of responses	Additional notes
river or stream	30	*none*
pond	54	*none*
wetland	12	*none*
lake	35	*none*
ditch	12	*none*
cultured minnows from licensed waters located indoors	0	*none*
cultured minnows from licensed waters located outdoors	10	*none*
other – please define:	1	• licensed water

11. During what month do you harvest minnows (choose all that apply)?

Answer	Number of responses
January	30
February	26
March	25
April	45
May	57
June	55
July	47
August	42
September	46
October	48
November	37
December	29
I do not harvest minnows.	8

Additional comments received for this question:

- I harvest April – June, depends on the spring (mostly May).
- I harvest leeches May, June, & July. I do not harvest minnows.

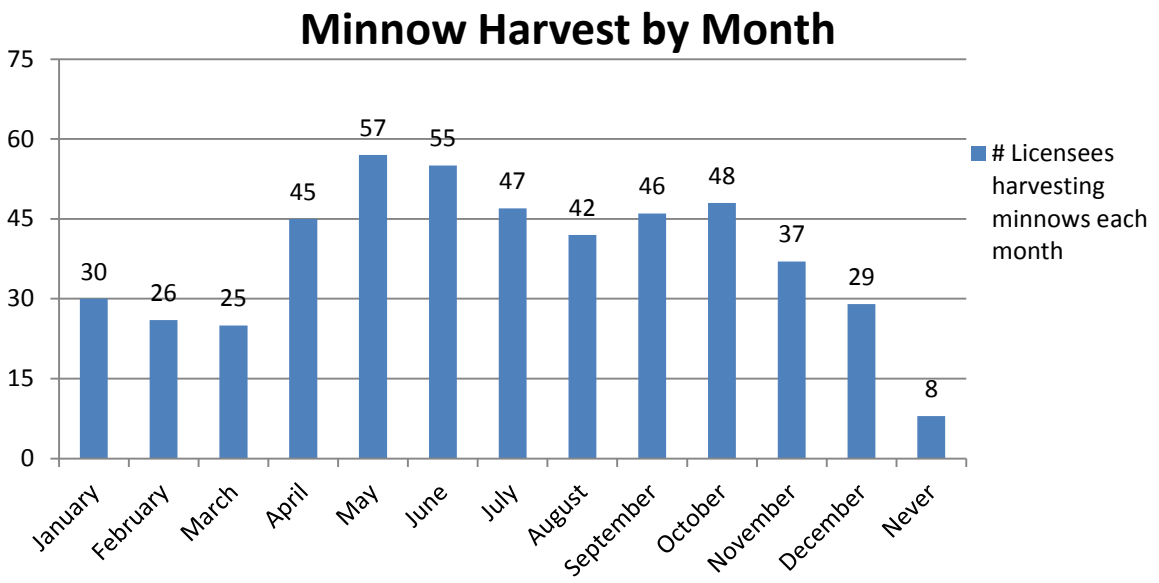


Figure 1: Minnow harvest by month as reported by respondents to questionnaire.

12. Do you personally use the minnows you harvest?

Answer	Number of responses	Percent of responses	Additional notes
Yes	41	55.41%	• I sell minnows to other shops. • leeches
No	30	40.54%	*none*
[No answer chosen]	3	4.05%	*none*

13. If you answered yes to question 12, are the minnows that you harvest used on a different water body?

Answer	Number of responses	Percent of responses	Additional notes
Yes	34	45.95%	• Minnows are used all over the state. • leeches
No	7	9.46%	*none*
[No answer chosen]	0	NA	*none*

14. If you answered yes to question 13, are the minnows used in a different watershed from where they originated?

Answer	Number of responses	Percent of responses	Additional notes
Yes	20	27.03%	• Sometimes • used within 30 miles of harvest
No	11	14.86%	*none*
Don't know	2	2.70%	*none*
[No answer chosen]	1	1.35%	*none*

15. Do you sell the minnows you harvest at retail?

Answer	Number of responses	Percent of responses	Additional notes
Yes	31	41.89%	*none*
No	38	51.35%	• not yet
[No answer chosen]	5	6.76%	*none*

16. If you answered yes to question 15, do you have a sense of where anglers are using bait they purchase from you?

Answer	Number of responses	Percent of responses	Additional notes
Yes	27	36.49%	*none*
No	4	5.41%	*none*

17. If you answered yes to question 16, are the minnows that you sell at retail used in a different watershed from where they originated?

Answer	Number of responses	Percent of responses	Additional notes
Yes	14	18.92%	• Sometimes we get lots of anglers going on vacation and want our bait & take the minnows all over – even out of state & the same for all tournament fishermen. • used within 30 miles of harvest.
No	10	13.51%	*none*
[No answer chosen]	3	4.05%	*none*

18. Do you sell the minnows you harvest at wholesale?

Answer	Number of responses	Percent of responses	Additional notes
Yes	43	58.11%	• Leeches
No	28	37.84%	• do not harvest myself anymore • not yet
[No answer chosen]	4	5.41%	*none*

19. If you answered yes to question 18, do know where the minnows you sold at wholesale are ultimately sold at retail?

Answer	Number of responses	Percent of responses	Additional notes
Yes	30	40.54%	• most, but not all
No	13	17.57%	*none*

20. If you answered yes to question 19, are the minnows that you sell at retail used in a different watershed from where they originated?

Answer	Number of responses	Percent of responses	Additional notes
Yes	19	25.68%	• sometimes • used within 30 miles of harvest
No	9	12.16%	*none*
Don’t know	2	2.70%	*none*

21. What types of gear and equipment do you use to harvest minnows in designated infested waters? (check all that apply)

Answer	Number of responses	Additional notes
net	11	*none*
seine	15	*none*
box trap	6	*none*
clover trap	5	*none*
hoop net	5	*none*
trap net	3	*none*
waders	17	*none*
bucket	17	*none*
grader	8	*none*
rope	13	*none*
cooler	5	*none*
float	7	*none*
dip net	17	*none*
holding tank	13	*none*
holding net	9	*none*
pump	5	*none*
brush	8	*none*
other	5	• On truck • Flat trap • Boat • Rubber gloves. Floating holder, otter sled, fence posts, mauls, hammer, lots of little miscellaneous things • Hardware cloth and rerod • Leech bags, metal leech traps • River traps • Tin traps, bag traps, coffee cans • Wire boxes • Anchor, river trap, b traps, oxygen tank and diffuser, rake

Other comments received:

- Control import and export, nothing in or out. Anglers as well. Limit the cutthroat practices in bait dealing. Johnny come in and drop market prices is an issue. Treat dealers like are Canadian brothers and guess what?
- I harvest primarily leeches. Maybe it is time to separate leeches and minnows in the definitions of MN statutes.

- We don't need any more restrictions on the bait industry. You are already destroying the fishing industry in the state very well with all your new rules and regulations. Bait dealers don't spread invasive species. Uneducated public does. Boaters- dock & lift installers - recreational users, etc. as well as birds (ducks, geese, loons, pelicans) and turtles and furbeavers. How are you going to try & control all recreational users without a rebelling or they stop using all the resources completely and then no use for DNR anymore. The biggest threat is wildlife. You can't control that. Must drive you control freaks nuts.
- This committee also needs to revisit the VHS rules. Thanks.
- I believe minnow trappers could keep the spread of AIS to a minimum with proper education. But ducks, seagulls, and especially loons will spread zebra mussels and ?. I watch loons gobble up zebra mussels on pike lake in Duluth then fly to other lakes where they regurgitate and spread.
- I know bait dealers seem to be the people with the target on their back when it comes to the spread of invasives, at least the starting focal point, and there is good cause to work with our group, but what about the anglers, what about hunters, what about boaters and skiers, etc. What do we have here less than 300 bait dealers. How many fishermen, hunters, skiers, etc.? This sport is a huge for our economy the problem of invasives is very bad and can't be ignored but reason has to be part of the equation to the solution. Our best efforts all combined to preserve the sport fishing industry and a good live bait part of that sport is and should be our goal.
- In Cass County we have many bait trappers that come in from other areas. I worry what they bring in here from their depleted areas.
- The spread of AIS could be spread by duck hunters, fur trappers, jet skis, and many other ways. I have talked to duck hunters at night on flowages on Winnie who are going to Bowstring in the morning. Jet skis going from Bowstring to Sand Lake, Etc. We need to find a way to cure the AIS problem as it keeps spreading with our continued use of waters.
- We'd like to make a few comments to send along with the questionnaire. By looking at the questions, it appears the DNR is looking at bait movement between watersheds. If this is not allowed we want you to be aware of the limitations this would place on intrastate commerce in the state. Southern Minnesota would not have enough leeches to meet the demand; Northern Minnesota would not have enough fatheads to meet the demands of fishermen. These are just two quick examples of what any regulation like that would have on the bait industry. Although we acknowledge AIS could be spread through the movement of live bait, we do not believe it would occur from respectable, responsible bait dealers. Any bait dealer that raises multiple species has to take steps to assure they do not introduce other species into their ponds. This requires certain procedures to be taken to assure equipment is dry, clean, etc.. These steps are included

in any HACCP plan. We operated this way long before there was a name for a HACCP plan and continue to do so. However, our fear if AIS movement with live bait comes with our state's lack of enforcement of current rules and regulations. Multiple times this spring we heard reports of fishermen taking pails of minnows, mainly spottails from lakes in Spicer, Alexandria, and Ottertail areas. Fishermen are not supposed to take water and transport it, but in spite of this law it has been done numerous times. The Alexandria area is full of lakes with zebra mussels and their movement doesn't need to be aided by unresponsible actions. Bait dealers are required to get transportation permits, have lakes VHS tested, tag equipment... These are thorough steps that should prevent the spread of AIS from the bait industry. Our recommendation would be complete closure of any live bait harvest, minnows and leeches, from fishermen, unless you have a Bait Dealers License and take AIS training. Also, clearly post this in regulations in the Minnesota fishing regulation book. As the pop can full of Zebra Mussels in Crooked Lake showed this spring, AIS will spread. The Live Bait industry in this state did not introduce any of this here. With care, the industry should be able to function with little chance of AIS spread from bait dealers. Let's not discriminate against the bait industry and make the rules too difficult for the industry to function. I will get a hold of you to be on the advisory committee. Thank you.

- I only trap leeches.