Minnesota Department of Natural Resource - Natural Resource Guidance Checklist

Natural Resource Inventory and Analysis for City or County

NRI

Why Use This Checklist?

This checklist is for a Natural Resource Inventory and Analysis, covering a fairly large land area (e.g., the whole city or county). This kind of inventory is useful to the local unit (e.g. city or county government) in developing policies, informing land use decisions, and identifying areas for natural resource conservation and management. A natural resource inventory should be done at least every 10 years or sooner if the resources have changed significantly.

NR Checklist Series

This is one of a series of "checklists" produced for local units of government (LUG) by the Minnesota Department of Natural Resources, Metro Region. Each checklist is intended to help the community integrate natural resources into a particular type of local policy or plan. Each checklist is an outline of key components of a typical LUG planning document with important natural resource-related questions to consider and some examples, definitions, and references.

A. Purpose

- What is the intended purpose or use for this natural resource inventory and analysis? For example, is its intended use one of the following and how does that suggest what it should entail?
  - to guide development of goals and strategies for resource conservation and management
  - to identify priorities for resource conservation
  - to evaluate current natural resource management practices
  - to guide policy development
  - to provide information for parks, open space, trails and/or greenway planning
- What are the specific products which the inventory needs to produce to be useful? (e.g. maps, data sets, etc - see section F below)
- How will specific inventory scope, methods and products be chosen to help the community answer its questions, address its issues, and progress towards sound decision making?

See Another Checklist

natural area management plan

Once a site is identified for a specific use, a more detailed inventory and management plan tailored to that use is needed. This finer scale is addressed in the "**Natural Area Management Plan" Checklist**.

B. Context

<u>Larger landscape</u>

Some natural resource issues are best addressed in the context of the larger landscape, often across jurisdictional boundaries.

- What needs and opportunities exist to address key issues at a larger scale? (e.g., at a watershed level)
- Have larger landscape patterns been addressed (e.g. using the Ecological Classification System - see box on next page) and how might that information be used to suggest opportunities and needs to coordinate with other communities in the same zones?
- What are the economic, social and/or ecological roles of natural areas, commercial forestry lands, and/or agricultural lands, both within the municipality and among municipalities and counties?

Definition

natural area

a site largely unaltered by modern human activity, where vegetation is distributed in naturally occurring patterns.

Community values

- What is known about local values and concerns regarding natural resources?
- Is this inventory process coordinated with a community participation or visioning process in which local people are identifying the importance they place on natural resources?
- Are such processes being used to help give direction or identify priorities for natural resource conservation?

C. Inventory Content

Natural resources to be inventoried

The community needs to develop a list of the types of natural resources whose locations and characteristics should be identified and mapped in the natural resource inventory. The decision on which resources to inventory should be based upon which natural resources are most important to the local economy and its citizens and/or it may be ones most unique and/or threatened. Natural resources which may be inventoried include the following (with more specifics provided on some of these in the next sections):

- existing land cover, including the types of forests, wetlands, other types of vegetation, agricultural lands, impervious surface, etc.
- significant or sensitive native plant communities (see below)
- ecological landscapes (e.g., using the Ecological Classification System)
- species that are endangered, threatened or of special concern (see below)
- game and non-game wildlife and wildlife habitat
- forest resources (see below)
- wetlands, rivers, streams, and lakes
- surface and groundwater quantity and quality
- soil types and suitabilities
- landforms, such as hills, streams, and watersheds
- geological hazards, such as floodplains, highly erodible soils, and areas of karst geological formations
- aggregate resources, such as sand and gravel deposits
- mineral resources, including precious and ferrous minerals
- local energy sources
- greenways and habitat connections between sensitive areas
- status of land conservation (e.g., public ownership as protected open space and/or as park, enrollment in CRP, etc.)
- existing trails and public accesses and their distribution relative to human populations

Resources

DNR web pages

Many natural resource data layers, including native plant communities mapped by the Minnesota County Biological Survey, are available on the "data deli" at deli.dnr.state.mn.us. Information about rare species, native plant communities, and land protection options are available on the DNR's web site at www.dnr.state.mn.us/ecological_services/nhnrp.

Definition

native plant community

A group of native plants (plants indigenous to the site) that interact with each other and their abiotic environment in ways not greatly altered by modern human activity or by introduced organisms.

Resources

Ecological Classification System (ECS)

The ecological land classification is part of a nationwide mapping system developed to improve our ability to manage natural resources on a sustainable basis. It is a method to identify, describe, and map progressively smaller areas of land of increasingly uniform ecological characteristics. Associations of biotic and environmental factors that directly affect or indirectly express differences in energy, moisture, and nutrient supplies are used. These factors include climate, geology, topography, soil, hydrology and vegetation.

Native plant communities

- Does the inventory identify locations of native plant communities in both upland and lowland areas?
- Does the native plant community inventory incorporate these basic standards?
    - Make use of Minnesota County Biological Survey (MCBS) data. New information should be incorporated using an adapted version of their methodology.
    - Standard names for plant communities, etc. should be used.
    - An ecological quality ranking, such as that described in the Minnesota Land Cover Classification System (MLCCS) handbook, should also be assigned to each native plant community location (polygon).

Rare species

- Does the inventory identify locations of state listed species (endangered, threatened and special concern)?

Forest resources

Forest resources include any rural forest lands (e.g., native forest communities, woodlands, plantations, etc.) as well as urban forests (trees within towns and developed areas such as those along streets, on public property and in private property).

- What are the community's forest resources that should be inventoried? For example, does it include resources such as the following?
    - native forests and woodlands (e.g. mesic oak forest, maple basswood forests, oak savanna, etc.)
    - plantations (e.g., managed for timber, Christmas trees, orchards, etc.)
    - woodlots, oldfields dominated by trees
    - trees on public (city and/or county, etc.) property (e.g., street trees)
    - historic or champion trees
    - hazard trees
- What type and level of inventory is needed to address the forestry issues of concern?
    - For example, does an inventory of rural forests provide information such as the following?
        - site characteristics
        - composition and condition of existing stands
        - presence and condition of wildlife populations
        - presence of any historic or cultural features

Resources

Natural Heritage Information System and Minnesota County Biological Survey (MCBS)

The Natural Heritage Information System provides information about rare species and native plant communities. The MCBS has collected these data for many counties. For a MCBS map of your county, call (651) 296-2835. For a printout of rare species and native plant community occurrences in your area, submit a completed data request form, available on the DNR web site (see box below) or by calling (651) 296-7863. To obtain rare species data electronically, call (651) 296-7863. Electronic native plant community data are available on the DNR's "data deli" (see box at top of previous page).

Resources

standard names for plant communities

see Minnesota's Native Vegetation: A Key to Natural Communities. MnDNR, Natural Heritage Program. 1993.

Resources

native plant communities

A regional plant ecologist with the Natural Heritage and Nongame Research Program can provide information about the Ecological Classification System, original vegetation, existing natural areas, and native rare plants and animals in your area. In the greater Twin Cities metro area, call 651-772-7570.

Special concerns

In addition to examining particular natural resource characteristics, the community may want to investigate issues of special concern that may be affecting or impacting natural resources. Some of these can only be assessed through field survey work and ground-truthing.

Depending on the purpose of the inventory they might include:

- invasive-exotic species
- tree canopy cover
- impervious surface
- forest health problems
- fire-prone property
- water management

D. Inventory Methodology

Methodology

The methods used should be based on a standard protocol suitable for the scale and purpose of the inventory.

- Does the inventory methodology incorporate these basic standards?
  - It combines delineation of land cover on infrared aerial photos/digital orthoquads (DOQs) and field checking and/or uses other data layers which are geo-referenced to DOQs.
  - The information is digitized and incorporated into a geographic information system (GIS).
  - The inventory is done by trained natural resource professionals and ecologists familiar with the particular Minnesota natural resources to be inventoried.
- Should the inventory incorporate a method being used by other communities within the region (e.g., the Minnesota Land Cover Classification System) to assist with sharing data and coordination?

Existing information

Design the inventory to gather missing information or improve the usefulness of existing data (e.g., National Wetlands Inventory, soil data, etc.).

- How will the format of newly-collected information be integrated with existing information?
- How will both be used?

Resources

Minnesota Land Cover Classification System (MLCCS) is a new GIS-based inventory method useful in providing land cover information for land use decision making which is being used throughout the Twin Cities Metro Region. It uses aerial photo interpretation and ground truthing to develop a GIS data layer with detailed native plant community and cultural land cover mapping to 1-2 acre polygon resolution. Contact MnDNR, Metro Region, bart.richardson@dnr.state.mn.us.

E. Analysis

Conducting analyses on inventory data

Once the inventory data is collected, it is used for conducting various analyses based upon the intended purpose for this work.

Analysis could be done on the following:

- existing habitat for particular wildlife
- potential greenway connections (for natural habitat and/or recreation purposes)
- opportunities for native plant community or habitat restoration (see below)
- areas needing vegetation management (e.g., street tree pruning or prairie burning or weed control)
- wildfire risk assessment
- overall state of natural resource health (e.g., including insect and disease problems, invasive exotic species, etc.)
- threats to unique plant communities
- lands with natural resource-based economic resources (e.g., tree farms, gravel pits, etc.)

Conservation/preservation areas

The community may want to conserve or protect from development areas such as commercial forest lands, agricultural lands, and/or significant natural areas.

- Does the analysis include identifying areas which the community would like to conserve and protect from development?
- Has the following information been identified for these areas to conserve?
    - specific sites for different types of conservation or protection
    - specific land protection tools, such as conservation easements, conservation overlay districts, etc. for each parcel
    - preliminary management goals, objectives, and/or recommendations for each parcel.

F. Results

Products

Typically, the most useful products of a natural resource inventory and analysis are coordinated sets of computer databases and GIS map layers which are compatible with the tools used by the local unit for planning and management purposes. This allows for the natural resource information (data layers) to be easily accessed, frequently used, and as needed updated by local staff.

- What products will make the results of this inventory and analysis most useful to the local unit?
- Which of these typical products should be included?
    - a series of GIS data layers and maps (and related databases), e.g. on:
        - land cover type (with each polygon mapped and

referenced to a table of attributes)
    - soils, by type
    - wetlands, by type and jurisdiction
    - lakes, by state shoreland management classification
    - agricultural land, by productivity class
    - lands enrolled in a conservation reserve program
    - forest cover, by type, age and condition
    - steep slopes (e.g., greater than 12 percent)
    - flood plains
    - important plant and animal habitats
- a description (written narrative) on the community's major and most unique natural features
- brief lists of key elements, e.g. dominant species or rare species found in community
- a discussion (written narrative) of issues, problems, threats, etc. related to natural resources
- recommendations, priorities, or next steps (see below)

Using the results

Depending on the purpose of the inventory and analysis, the final report or product may suggest additional uses for this information. Additional uses could include:

- developing a set of goals and strategies for resource conservation and management for the overall area, as well as specific goals and strategies for key natural resource areas
- identifying priorities for natural resource management and/or conservation, and/or protection (e.g., this could involve rating or ranking conservation of areas or features with consideration given to factors, such as, how imminent is the loss or destruction of the resource, relative rarity of the resource, community values, economic or commodity value of the resource, etc.)
- evaluating current development patterns and practices (e.g., how well are natural systems and the services they provide being maintained or restored? Are renewable resources being managed in a sustainable way?)
- guiding local policy development (e.g., how would the information be used in comprehensive planning, development review, recommendations for future growth patterns, etc.?)
- providing information for parks, open space, trails, and greenway planning.

Reference

This checklist includes ideas from "Under Construction: Tools and Techniques for Local Planning" Minnesota Planning. 2002.