

4.24 MA 24 - North Rudyard Management Area

Summary of Use and Management

Management in the North Rudyard management area (MA) (Figure 4.24.1) will emphasize wildlife habitat, timber production and provide for forest-based recreational opportunities. Wildlife habitat management will include: maintaining or enhancing the deer wintering area special conservation area; perpetuating early-successional communities for young-forest dependent species; wildlife related recreation opportunities; and maintaining soft and hard mast sources. Timber management within this 10-year planning period will work toward balancing the age classes of aspen; increasing the proportion of young oak; and the continuation of management through selection harvest of the northern hardwood cover type. Expected issues in this 10-year planning period are increased recreational pressure and introduced pests and diseases, especially beech bark disease and emerald ash borer.

Introduction

The North Rudyard management area is located in the east portion of the eastern Upper Peninsula in central Chippewa County and has 8,256 acres of state-owned land. Wildlife habitat is the primary attribute in this management area. Additional attributes which were important in identifying this management area include:

- The management area falls within the Niagaran Escarpment and Lake Plain subsection 8.1 of the eastern Upper Peninsula ecoregion (Albert, 1995).
- The dominant landform consists of clay lake plain, with a small area of sandy lake plain. The northern portion of the management area is in a large, clay lake plain which extends north nearly to Brimley and east to the St. Mary's River. The Clay Lake Plain Ecosystem Project was published in 1995. This Upper Peninsula Resource Conservation and Development report describes the clay lake plain in detail.
- The south end of the management area has an upland ridge where northern red oak is found. Northern red oak is the primary hard mast species in this area. Wildlife game species using this food source include: deer, bear, ruffed grouse, squirrels and turkeys.
- Recreational opportunities include bear, grouse and deer hunting, and snowmobiling.
- In the southeast corner of the management area there is a deer wintering area special conservation area.

The state forest land in this management area is concentrated, with a few private ownerships in the middle. The North Rudyard Management Area is within the Sault Ste. Marie Forest Management Unit. The predominant cover types, acreages and projected harvest acres for the management area are shown in Table 4.24.1.

Table 4.24.1. Current cover types, acreages, projected harvest acres and projected ten-year cover type acreage for the North Rudyard management area, eastern Upper Peninsula ecoregion (2012 Department of Natural Resources inventory data).

Cover Type	Cover %	Current Acreage	Hard Factor Limited Acres	Manageable Acres	10 Year Projected Harvest (Acres)		Projected Acreage in 10 Years	Desired Future Harvest (Acres)	
					Final Harvest	Partial Harvest		Final Harvest	Partial Harvest
Lowland Open/Semi-Open Lands	26%	2,182	0	2,182	0	0	2,182	0	0
Aspen	14%	1,128	11	1,117	18	0	1,128	186	0
Cedar	14%	1,124	13	1,111	10	0	1,124	69	0
Lowland Aspen/Balsam Poplar	13%	1,077	96	981	375	0	1,077	164	0
Northern Hardwood	9%	706	0	706	0	102	706	0	344
Lowland Deciduous	8%	635	36	599	6	0	635	67	0
Lowland Conifers	4%	320	64	256	28	0	320	28	0
Lowland Spruce/Fir	3%	261	18	243	0	0	261	27	0
Upland Open/Semi-Open Lands	1%	102	0	102	0	0	102	0	0
Misc Other (Water, Local, Urban)	0%	26	0	26	0	0	26	0	0
Others	8%	695	26	669	70	88	695	83	158
Total	100%	8,256	265	7,991	506	190	8,256	624	502

Others include: tamarack, oak, lowland mixed forest, red pine, upland mixed forest, mixed upland deciduous, upland conifers, upland spruce/fir, and jack pine.

North Rudyard

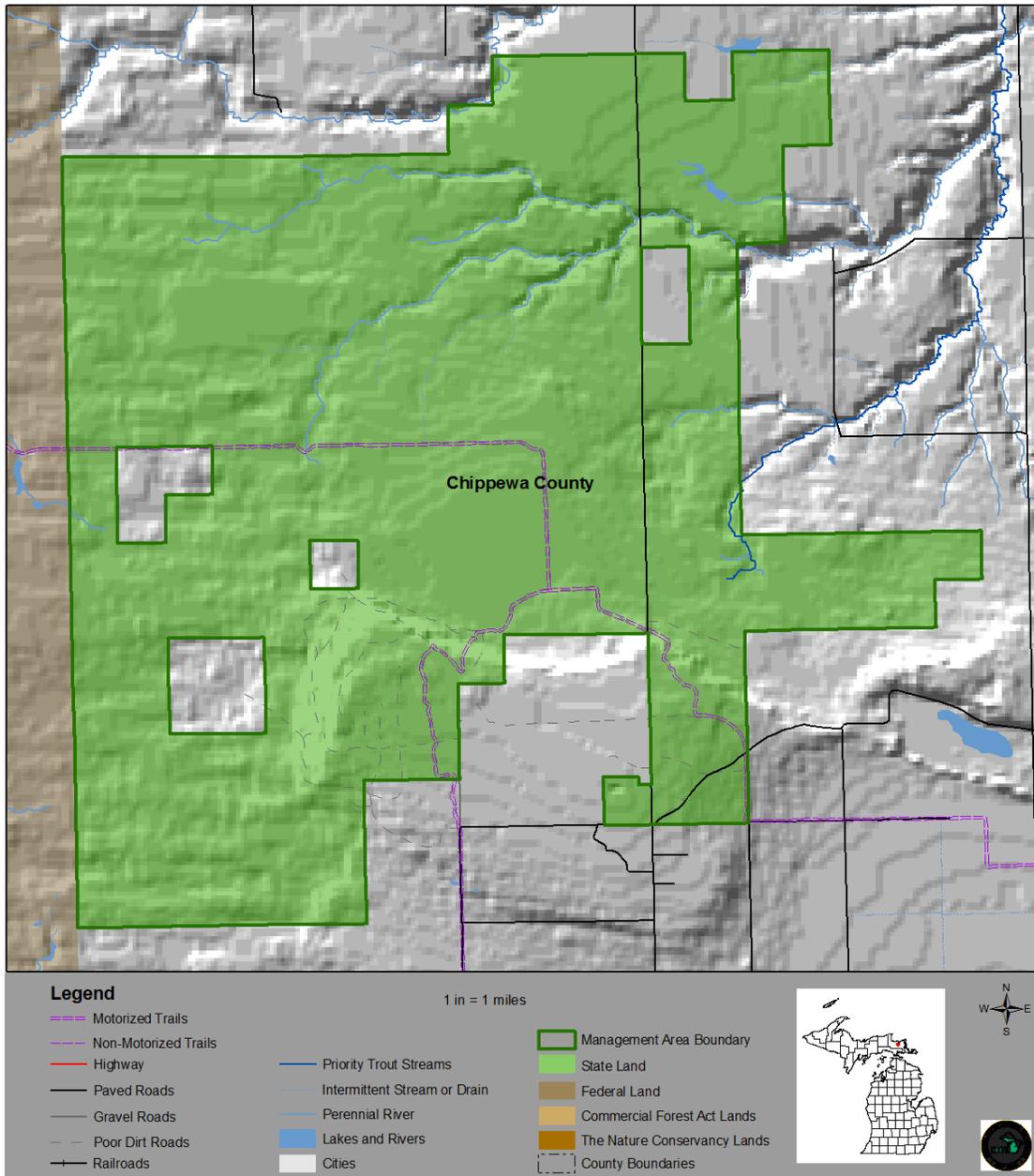


Figure 4.24.1. Location of the North Rudyard management area (dark green boundary) in relation to surrounding state forest lands and other ownerships.

4.24.1 Forest Cover Type Management Direction

The following sections contain information on vegetation management direction in the form of Desired Future Conditions, 10-Year Management Objectives and Long-Term Management Objectives for each of the major cover types or forest communities within the management area. This information applies to those portions of the forest where active management (i.e., timber harvest, prescribed fire, planting and mowing) will be conducted. In other portions of the state forest, passive management resulting in natural succession will achieve ecological objectives. While most stands have a variety of tree species and other vegetation, they are classified by the predominant species.

All of the following cover types are valued commercially for their timber products; ecologically as sources of habitat for numerous species; and for the variety of recreational opportunities they provide. Harvesting these cover types will provide for a continuous flow of forest products and values.

Section 4.24.1.1 Forest Cover Type Management – Lowland Open/Semi-Open Lands

Current Condition

Lowland open/semi-open lands occur on 2,182 acres (26%) of the management area (Table 4.24.1). This category is a combination of: lowland shrub (1,864 acres), marsh (191 acres), bog (127 acres) and treed bog (zero acres). These cover types are valued ecologically as sources of habitat for numerous species of wildlife. Many of these stands are found in association with streams and rivers and contribute to the access issues in the management area. Willow is more abundant than tag alder in the expansive lowland brush areas. Presently, this cover type is used as habitat for sharp-tailed grouse, snowshoe hare and songbirds.

Desired Future Condition

- Lowland open/semi-open lands will be retained in their current state to ensure an adequate level of wildlife habitat and recreational opportunity.

10-Year Management Objectives

- Maintain this cover type for wildlife habitat; and
- Evaluate lowland brush stands for reversion to younger age classes to provide habitat for woodcock and other species maintaining most of these stands without active management.

Long-Term Management Objectives

- Within these stands allow natural processes to occur while protecting their ecological values from man-made disturbances.

Section 4.24.1.2 Forest Cover Type Management – Aspen

Current Condition

Aspen occurs on 1,128 acres (14%) of the management area (Table 4.24.1). Aspen is distributed throughout the management area on dry to mesic, poor- to medium-nutrient sites with Kotar habitat types of PArVAa and ATFD (see Appendix E). Aspen has been consistently harvested in the last 30 years resulting in a large amount of young stands in this area (Figure 4.24.2). Over 25% of the aspen stands have been classified as uneven aged.

Currently, 40 acres of aspen have a final harvest prescribed. There are 11 acres of aspen that have site conditions limiting their harvest at this time. These hard factor limited acres have been removed from the total number of manageable acres available for harvest calculations. Inaccessible stands of aspen will eventually succeed to late successional species.

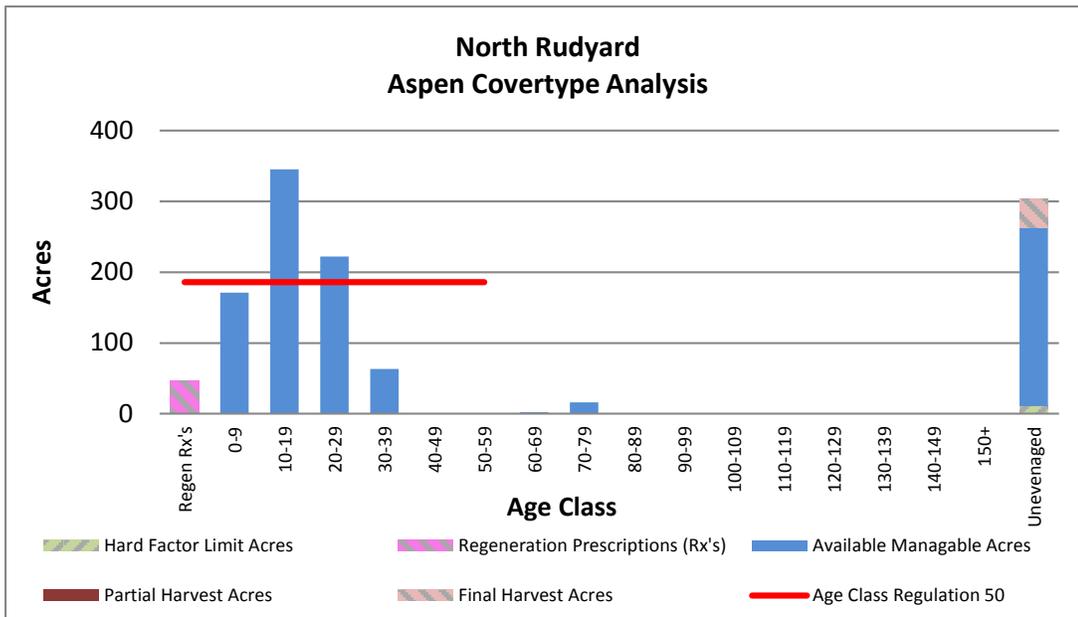


Figure 4.24.2. Age-class distribution of aspen in the North Rudyard management area (2012 Department of Natural Resources inventory data).

Desired Future Condition

- Aspen will be maintained on operable sites through even-aged management with acres balanced between 0-59 years of age to provide for regulated harvest, wildlife habitat and recreational opportunities.

10-Year Management Objectives

- The projected 10-year final harvest of aspen is 18 acres. This reduction from the regulated amount is due to the current age-class structure with most of the stands in young age classes.

Long-Term Management Objectives

- Balance the age-class structure of available aspen providing for a regulated harvest of approximately 186 acres per decade (red line in Figure 4.24.2).

Section 4.24.1.3 Forest Cover Type Management – Cedar

Current Condition

Cedar occurs on 1,124 acres (14%) of the management area (Table 4.24.1). Many of the cedar stands are within a wintering deer area special conservation area. Maintaining a closed canopy structure provides important cover for deer, reducing snow depths within the stands. Some of the stands are in areas inaccessible to harvest. There has been no harvest and regeneration work in recent years (Figure 4.24.3). While harvesting of cedar is not emphasized in this management area, look for opportunities to harvest cedar where winter deer habitat is not impacted, cedar regeneration is likely and wetland soils are not adversely impacted.

Currently there are no acres of cedar with a final harvest prescribed. There are 13 acres of cedar that have site conditions limiting their harvest at this time. These hard factor limited acres have been removed from the total number of manageable acres available for harvest calculations. Cedar stands in areas inaccessible for harvest will be subject to natural processes, resulting in a range of successional stages.

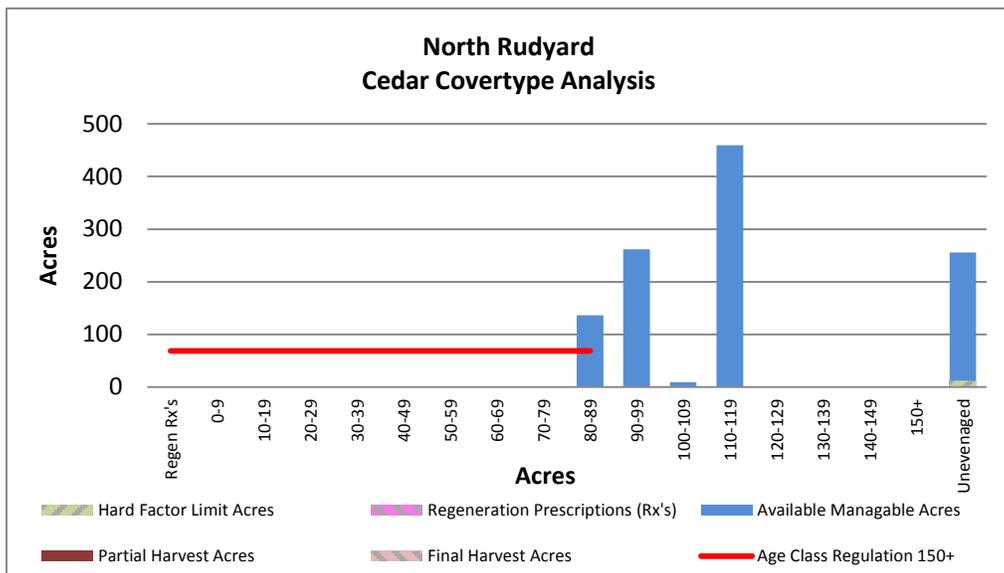


Figure 4.24.3. Age-class distribution of cedar in the North Rudyard management area (2012 Department of Natural Resources inventory data).

Desired Future Condition

- In areas where deer browse is a concern, these stands may not be actively harvested.

10-Year Management Objectives

- The 10-year projected final harvest of cedar is 10 acres, with the reduction from the regulated amount due to the deer wintering area. However, harvest of this type, if it occurs, may vary widely from the projected harvest in order to meet the long-term management objectives.
- Ensure that cedar and/or hemlock recruitment/regeneration is reliable if harvesting in this cover type.

Long-Term Management Objectives

- Within the deer wintering areas, focus cedar management on winter habitat for deer;
- Outside of the deer wintering areas, conduct regeneration harvests to diversify the age classes of cedar; and
- A regulated harvest, using a 150 year rotation, would allow approximately 69 acres of cedar to be harvested each decade.

Section 4.24.1.4 Forest Cover Type Management – Lowland Aspen/Balsam Poplar

Current Condition

Lowland aspen/balsam poplar occurs on 1,077 acres (13%) of the management area (Table 4.24.1). A portion of the stands have been typed as uneven aged (Figure 4.24.4). Available stands have been successfully harvested and regenerated through natural regeneration resulting in a variety of age classes.

Currently there are 68 acres of lowland aspen/balsam poplar with a final harvest prescribed. There are 96 acres of lowland aspen/balsam poplar that have site conditions limiting their harvest at this time. These hard factor limited acres have been removed from the total number of manageable acres available for harvest calculations. Inaccessible stands of lowland aspen/balsam poplar will eventually succeed to late successional species.

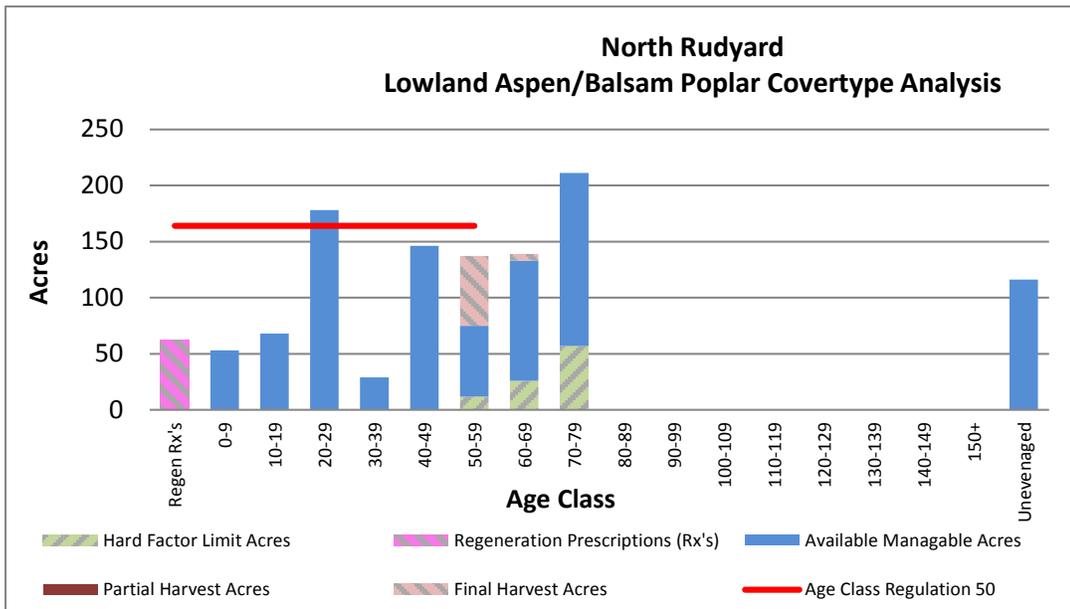


Figure 4.24.4. Age-class distribution of lowland aspen/balsam poplar in the North Rudyard management area (2012 Department of Natural Resources inventory data).

Desired Future Condition

- Lowland aspen/balsam poplar will be maintained on operable sites through even-aged management with acres balanced between 0-59 years of age providing for a regulated harvest, wildlife habitat and recreational opportunities.

10-Year Management Objectives

- The 10-year projected final harvest of lowland aspen/balsam poplar is for 375 acres. The increase from the regulated amount is due to the low numbers of acres in the 0-9 and 10-19 year-old age classes and the large number of stands that are over-mature.

Long-Term Management Objectives

- Balance the age class of accessible lowland aspen/balsam poplar providing for a regulated harvest of approximately 164 acres per decade.

Section 4.24.1.5 Forest Cover Type Management – Northern Hardwood

Current Condition

Northern hardwood stands occur on 706 acres (9%) of the management area (Table 4.24.1). Northern hardwoods are found on mesic-medium to rich sites with Kotar habitat types of AFPO and AFOAs. These are high quality sites that provide good growth. The majority of the stands have been managed as uneven aged. Northern red oak is often a component of these stands.

In most stands, conduct selection harvests in stands with a basal area over 120 square feet per acre decreasing stocking levels to a basal area of approximately 80 square feet per acre. In general, this will allow most northern hardwood stands to be selectively harvested every 20 years. Where site quality is poor shelterwood and other even-aged harvesting systems will be considered. Recent harvests using even-aged systems are shown in the immature column in Figure 4.24.5.

Beech bark disease is found throughout the management area resulting in high beech mortality. Many stands have had or will have salvage harvests due to beech bark disease. Northern hardwood stands that had a component of beech now have decreased stocking levels due to beech bark disease mortality and salvage harvesting. Further selection harvesting will be delayed, due to resultant lower than normal residual basal area.

Currently there are 540 acres with a partial harvest prescription assigned (Figure 4.24.5). There are no acres of northern hardwoods that have site conditions limiting their harvest at this time.

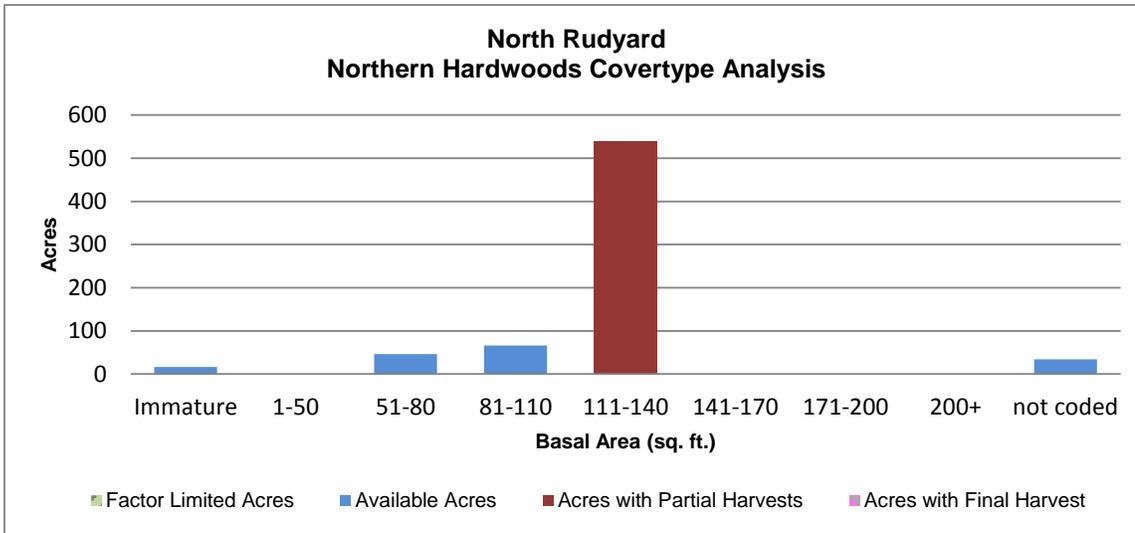


Figure 4.24.5. Basal area distribution of northern hardwoods in the North Rudyard management area (2012 Department of Natural Resources inventory data).

Desired Future Condition

- Northern hardwood stands will be maintained on operable sites by using individual tree selection harvesting to provide uneven-aged composition and structurally diverse stands; and
- Harvesting will provide for a continuous flow of timber products and a variety of wildlife habitat and recreational opportunities.

10-Year Management Objectives

- The 10-year projected partial or selection harvest of northern hardwood is 102 acres;
- Continue salvage harvests of beech affected by beech bark disease using Beech Bark Disease Management Guidelines;
- Evaluate stands that had a component of beech to determine the impact of beech bark disease on regeneration;
- Track beech regeneration in these stands; and
- To favor regeneration of hardwood other than beech, consider herbicide applications and the planting of hard mast producing trees, including oak and disease resistant beech.

Long-Term Management Objectives

- Selectively harvest northern hardwood stands on a 20-year cycle.

Section 4.24.1.6 Forest Cover Type Management – Lowland Deciduous

Current Condition

Lowland deciduous stands occur on 635 acres (8%) of the management area (Table 4.24.1). Lowland deciduous stands in this management area are often found in association with the creeks and drainages making access difficult. Approximately 38% of the lowland deciduous stands have been listed as uneven aged (Figure 4.24.6). This is generally due to natural processes resulting in a range of size and age classes within the inaccessible stands. Natural regeneration has been effective after past harvesting.

Currently there are 120 acres of lowland deciduous with a final harvest prescribed. There are 35 acres of other cover types that are expected to convert to lowland deciduous after harvest. These acres are shown in Figure 4.24.6 in the regeneration prescriptions column. There are 36 acres of lowland deciduous that have site conditions limiting their harvest at this time. These hard factor limited acres have been removed from the total number of manageable acres available for harvest calculations. Lowland deciduous stands in inaccessible areas will be subject to natural processes (fire, windthrow, insect defoliation and beaver flooding) resulting in a range of successional stages.

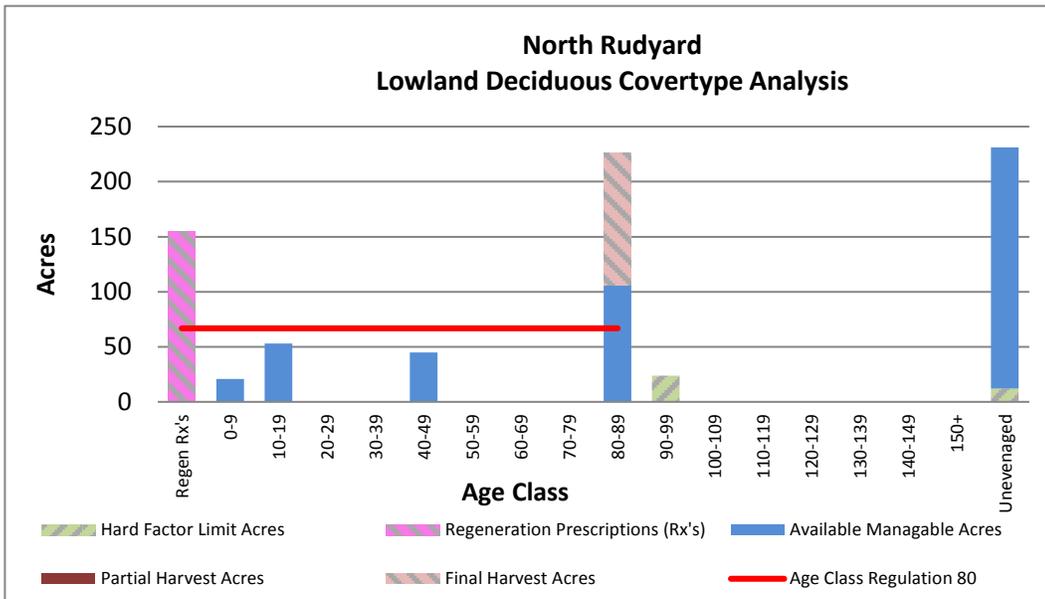


Figure 4.24.6. Age-class distribution of lowland deciduous in the North Rudyard management area (2012 Department of Natural Resources inventory data).

Desired Future Condition

- Lowland deciduous stands will be maintained on operable sites generally through even-aged management with acres balanced between 0-89 years of age to provide for regulated harvest, wildlife habitat and recreational opportunities.

10-Year Management Objectives

- The 10-year projected final harvest of lowland deciduous is 6 acres. The decrease from the regulated amount is due to the large number of acres in the regeneration prescriptions column; and
- Follow Emerald Ash Borer Management Guidelines in stands with a component of ash.

Long-Term Management Objectives

- Balance the age class structure of available stands providing for a regulated harvest of approximately 67 acres per decade.

Section 4.24.1.7 Forest Cover Type Management – Other Types

Current Condition

There are many other forest cover types spread across the management area that have less than 5% of the total management area acres (Table 4.24.1). Lowland conifers (320 acres or 4%) and lowland spruce/fir (261 acres or 3%) are the two largest cover types. Other types is made up of cover types with 2% or less of the total management area acres and includes: tamarack (188 acres), oak (140 acres), lowland mixed forest (92 acres), red pine (77 acres), upland mixed forest (66 acres), mixed upland deciduous (62 acres), upland conifers (38 acres), upland spruce/fir (21 acres) and jack pine (11 acres).

With the exception of oak and red pine most of these cover types will be managed as even-aged stands using natural regeneration after harvest. Mixed stands with high basal areas may be thinned prior to final harvest. Periodically thin red pine stands with high basal area prior to final harvest.

There are approximately 26 acres of these other minor cover types have site conditions limiting their harvest at this time. These hard factor limited acres have been removed from the total number of manageable acres available for harvest. Inaccessible stands may never be harvested and will be subject to natural successional processes.

Desired Future Condition

- These cover types may be managed on operable sites contributing to the compositional diversity of the landscape while providing for continual harvest, wildlife habitat and recreation opportunity.

10-Year Management Objectives

- The projected 10-year final harvest is 28 acres of lowland conifers and 70 acres of other types; and
- The projected 10-year partial harvest is 88 acres of other types.

Long-Term Management Objectives

- Continue management of these other cover types to provide a sustainable yield of forest products and wildlife habitat.

4.24.2 – Featured Wildlife Species

A deer wintering complex is adjacent to hardwood stands in the southern part of the management area. These hardwood stands contain oak and provide nutrition to deer that are breaking out of their winter habitat.

American Woodcock

The goal for woodcock in the eastern Upper Peninsula is maintain or increase habitat. Management should address the maintenance of adequate early successional habitat to provide feeding, nesting, brood-rearing habitat and opportunity for hunting.

Wildlife habitat specifications:

- Balance aspen age-class distribution within the management area.
- Maintain or increase the aspen cover type within the management area. Where associated with alder, riparian zones or forested wetlands use silvicultural practices that encourage the aspen component in mixed stands.
- Maintain rough openings associated with alder, riparian zones or forested wetlands.

Red-shouldered Hawk

The goal for red-shouldered hawk is to maintain or improve suitable habitat in the ecoregion. Management activities should focus on the maintenance of large blocks of mesic northern forest with the appropriate level of large diameter trees in priority landscapes.

Wildlife habitat specifications:

- All known woodland raptor nests should be reported to local wildlife staff and included in Integrated Forest Monitoring Assessment and Prescription Geographic Decision Support Environment. Confirmed red-shouldered hawk nests are to be documented in accordance with the DNR Approach to the protection of Rare Species on State Forest Lands (CI 4172) and included in Integrated Forest Monitoring Assessment and Prescription Geographic Decision Support Environment. For Red-shouldered hawk nests, the wildlife habitat specifications contained within Michigan DNR's *Interim Management Guidelines for Red-Shouldered Hawks and Northern Goshawk on State Forest Lands* (August 2012) will be followed until the workgroup has completed the guidance that will permanently replace the interim guidelines.

Ruffed Grouse

The goal for ruffed grouse in the eastern Upper Peninsula is to maintain or improve habitat. Management should focus on maintaining and balancing the age-class distribution for aspen in priority landscapes.

Wildlife habitat specifications:

- Maintain the aspen cover type and increase the aspen component in mixed stands within the management area.
- Move to balance the age-class distribution of aspen and birch cover types to maintain young forests across the management area.
- Ideal aspen stands will be of 40-160 acres under a 50-60 year rotation.

- Larger harvest units should have irregular boundaries and include one or two, 1-3 acre unharvested inclusions for every 40 acres over 40 acres in size.
- Evaluate the conifer component in aspen stands, holding or increasing where desirable. Leave conifer under four-inch diameter at breast height in mixed stands and aspen types as immediate residual escape cover and to promote corridors.
- Maintain cherry production for soft mast.

White-tailed Deer

The eastern Upper Peninsula goals for white-tailed deer are to: 1) Maintain existing deer wintering complexes and 2) Expand the extent of areas suitable as winter deer habitat, especially in the medium and high snowfall zones. Management should focus on maintaining habitat quality in priority wintering complexes. DNR Department procedure 32.22-07 states “Coniferous swamps are important as winter deeryards and shall be managed primarily for deer. The objective shall be to maintain them for this purpose and through commercial cuttings and silvicultural practices, improve these areas to provide winter cover and food for deer.” There is a complex relationship between deer abundance; available summer and winter habitat; timber management; and regeneration tree species, particularly white cedar and hemlock. It is recognized that meeting both timber management and deer goals presents challenges for the department and our stakeholders. Information on deer wintering complexes is currently being updated and new management guidelines are being developed. When completed, these will provide additional direction for managing these critical areas for white-tailed deer.

Wildlife habitat specifications for deer wintering complexes:

- Strive to maintain > 50% of the land area within deer wintering complexes in mixed or pure stands of cedar, hemlock, white and black spruce, white and natural red pine, balsam fir, mixed swamp conifer and mixed upland conifer-hardwood.
- In northern white cedar and hemlock cover types that are commonly occupied by deer during severe winters, especially in medium and high snowfall zones, maintain canopy closure of >65%.
- In deer wintering complexes in low snowfall areas and within ¼-mile of severe-winter cover in the higher snowfall zones, write prescriptions that strive to maintain canopy closure of 40-65%, favoring cedar, hemlock, white spruce, black spruce, balsam fir and white pine.
- Provide winter forage in deer wintering complexes through stands of regenerating hardwood or brush, including preferred species of red maple, sugar maple, aspen, yellow birch, ashes, oaks, dogwood, crabapple, elderberry, high-bush cranberry, sumac and hazel.
- Enhance accessibility to winter browse within deer wintering complexes by maintaining mature mesic conifer components within upland hardwood stands or by maintaining or enhancing sheltered travel corridors between areas of conifer cover and browse.
- Provide spring break out areas by maintaining open hardwood stands on southern exposures and herbaceous openings adjacent to deer wintering complexes.
- When possible, timber harvests within deer wintering complexes should be carried out only during winter months and tops should be left. Chipping of non-bole wood and whole-tree harvesting in the deer wintering complexes should be avoided, but will be discussed on a case-by-case basis through the compartment review process.
- Harvests of cedar and hemlock may only be conducted when:
 - There is reasonable confidence of successful recruitment/regeneration of the cover types; or
 - There is a forest health issue (e.g., hemlock woolly adelgid); or
 - Part of an approved research project; or
 - Removal of selected trees will facilitate a reduction of harvest trails, landings, etc. to minimize soil sedimentation and possible soil compaction issues.
- Provide fall foods in the form of hard and soft mast, and provide dense escape cover or bedding areas in the form of early successional forests, brush and warm-season grasses that will encourage fall deer use in areas open to public hunting. Where habitat types are appropriate, increase diversity of hard mast by planting oak.

4.24.3 – Rare Species and Special Resource Area Management

All forest operations must be reviewed for potential conflicts with rare species following the guidance in “*DNR’s Approach to the Protection of Rare Species on State Forest Lands*” (IC4172). This is especially important when listed species are present or past surveys have indicated a possibility of their presence.

Past surveys have noted and confirmed no listed species or natural communities of note occurring in the management area. A colony of great blue herons has been identified. Any established management guidelines will be followed. Further surveys for special species and natural communities will be carried out as a matter of course during the inventory process and opportunistically for special more focused surveys.

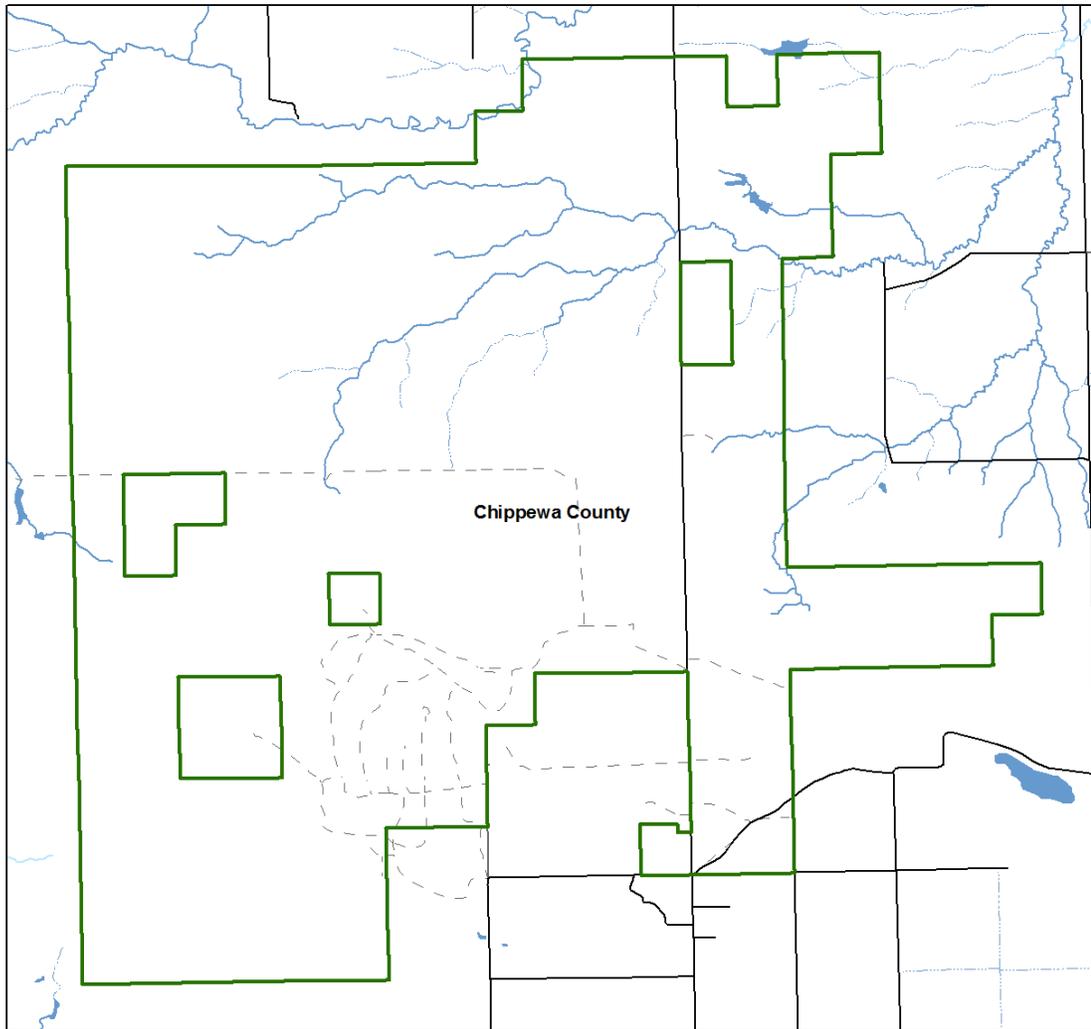
Special conservation areas found within the management area are high priority trout streams and deer wintering areas as shown in Figure 4.24.7.

There have been no high conservation value areas or ecological reference areas identified in the management unit as illustrated in Figure 4.24.7.

The management goal during this planning period is:

1. Document occurrences of rare, threatened, endangered and special concern species and natural communities for the management area through the inventory process or with occasional focused surveys.

North Rudyard



Legend

- Highway
- Paved Roads
- Gravel Roads
- - - Poor Dirt Roads
- Railroads
- - - Intermittent Stream or Drain
- Perennial River
- Lakes and Rivers
- Management Area Boundary
- Cities
- - - County Boundaries

- Ecological Reference Areas
- High Conservation Value Areas**
- Coastal Environmental Areas
- Critical Dunes
- Natural Rivers Vegetative Buffer
- Natural Rivers Zoning District
- Critical Coastal Habitat (Piping Plover)
- Kirtland Warbler Habitat
- Dedicated Management Areas
- Natural Areas Legally Dedicated

1 in = 1 miles

Special Conservation Areas

- Campgrounds
- Fishing Access Sites
- Boat Access Sites
- Mineral Resource Locations
- Wild & Scenic Rivers (USFS Lands)
- Visual Management Areas
- Contiguous Resource Areas
- Possible Type 1 and Type 2 Old Growth
- Potential Old Growth
- Non-Dedicated Natural Areas & National Natural Landmarks
- Springs, Wetlands, or Riparian Areas



- Cold Water Streams & Lakes
- Wildlife Management Areas
- Research, Development, and Military Lands
- Great Lakes Islands

Figure 4.24.7. A map of the North Rudyard management area showing the special resource areas.

4.24.4 – Forest Health Management

Although forest health issues span the entire landscape, some specific threats are more important in this management area due to the species composition, site quality or other factors. Some of the more important forest health pests in this management area by major cover type include:

- Aspen and lowland aspen/balsam poplar: white trunk rot and *Hypoxyylon* canker;
- Northern hardwoods: beech bark disease; and
- Cover types with ash: emerald ash borer.

For further information on forest health refer to section 3.

Invasive Plant Species

Invasive species may pose a major threat to forest resources, impacting timber production, wildlife habitat and recreational access. No invasive plant species have yet been documented within the management area. Purple loosestrife has been documented within a five-mile buffer of the management area (Table 4.24.2) and monitoring efforts should specifically look for new populations of this species. Invasive species that merit eradication efforts are those species that threaten sensitive sites due to their location or growth characteristics and have population levels that may be successfully controlled.

Table 4.24.2. Invasive plant species within or near the North Rudyard management area (Data from the Michigan Invasive Plant Identification Network database).

North Rudyard - FRD Management Areas	Cases within FRD Areas	Cases within 5 Mile Buffer	Total number of cases	Total number of different Invasive Species
	0	1	1	1
Invasive Species within FRD Areas	Occurrences	Invasive Species within 5 Mile Buffer	Occurrences	
-	-	Purple Loosestrife <i>Lythrum salicaria</i>	1	

4.24.5 – Fire Management

Consider reintroducing fire into the oak type in this management area to encourage natural regeneration of the oak.

Prescribed fire may be used to maintain the open nature of some of the natural communities in this management area.

4.24.6 – Public Access and Recreation

County road access is limited to the south and east part of the management area, with the Tilson Road giving north south access. There are few forest roads in the area; therefore, most of the management area is inaccessible.

The only recreational facility is the main snowmobile trail connecting the local communities of Rudyard and Kinross.

4.24.7 – Aquatic Resource Management

Fisheries Division management unit biologists will review proposed forest management activities using the compartment review process and will consider the potential impact of proposed prescriptions upon riparian and aquatic values.

Management prescriptions will be modified to account for riparian and aquatic values by applying the standards and guidance documents listed in the introduction to this plan section to the unique conditions specific to any given forest stand.

Prescription of riparian management zone widths greater than the minimum widths provided in IC4011 (*Sustainable Soil and Water Quality Practices on Forest Land*) must be justified and documented during the compartment review process.

Forested stands adjacent to designated high priority trout streams will specifically be managed to discourage beaver use in accordance with both DNR Policy and Procedure 39.21-20 Beaver Management and IC 4011. There is one designated high priority trout stream (South Branch of the Waishka River) identified in this management area and the details are shown in the Integrated Forest Monitoring Assessment and Prescription Geographic Decision Support Environment and in Figure 4.24.1.

4.24.8 - Minerals

Surface sediments consist of lacustrine (lake) clay and silt, coarse-textured till, and peat and muck. There is insufficient data to determine the glacial drift thickness. Sand and gravel pits are located in the management area and there is potential for additional pits on the uplands.

The Ordovician Trenton and Black River Formations subcrop below the glacial drift. The Trenton and Black River are quarried for stone/dolostone in the Upper Peninsula.

Exploration and development for oil and gas has been limited to a few wells drilled in the Upper Peninsula (14 in Chippewa County). No economic oil and gas production has been found in the Upper Peninsula.

Metallic mineral production is not supported by the geology given the depth to known metallic bearing formations.