

4.4 Brule/Iron River Tracts Management Area

Summary of Use and Management

Vegetative management in the Brule/Iron River Tracts management area (MA) (Figure 4.4.1) will provide a variety of forest products; maintain or enhance wildlife habitat; protect areas with unique characteristics; and provide for forest based recreational uses. Forest management objectives for the 10-year planning period include priorities for this area are to maintain a forested buffer on the Brule River and connecting cold-water streams; improving access for recreational users; maintaining the presence of minor cover types on the landscape; and maintaining non-forest vegetation types. Wildlife management objectives include maintaining large tracts of mature forest, particularly along this riparian corridor. Management activities may be constrained by site conditions and the small tract size. Recreational access and undivided ownership will be issues for this 10-year planning period.

Introduction

The Brule/Iron River Tracts management area is on a drumlinized ground moraine in southern Iron County. The state forest covers about 3,300 acres and is in small-scattered parcels. The management area is dominated by the aspen, northern hardwoods, and lowland conifer cover types. Other attributes that played a role in the definition of this management area include:

- Dominated by mesic northern forest natural communities;
- Mid-range in site quality;
- The major ownerships in this vicinity are mostly non-industrial private, forest industry, and U.S. Forest Service; and
- Many parcels share undivided interests with other owners.

The management priorities for this area are to maintain a forested buffer on the Brule River and connecting cold-water streams. Improving access for recreational users to this area is also a priority.

The predominant cover types, composition and projected harvest areas for the Brule/Iron River Tracts management area are shown in Table 4.4.1.

Table 4.4.1. Summary of cover types, composition, limited factor area, manageable area and projected harvest area for the Brule-Iron River Tracts management area (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
Aspen	50%	1,726	292	1,434	271	0	1,726	239	0
Northern Hardwood	19%	644	0	644	0	316	644	0	316
Lowland Conifers	6%	198	62	136	53	0	198	15	0
Upland Open/Semi-Open Lands	8%	266	0	266	0	0	266	0	0
Lowland Open/Semi-Open Lands	6%	216	0	216	0	0	216	0	0
Misc Other (Water, Local, Urban)	4%	150	0	150	0	0	150	0	0
Others	8%	266	118	148	55	0	266	18	0
Total		3,466	472	2,994	378	316	3,466	272	316

Brule-Iron River Tracts

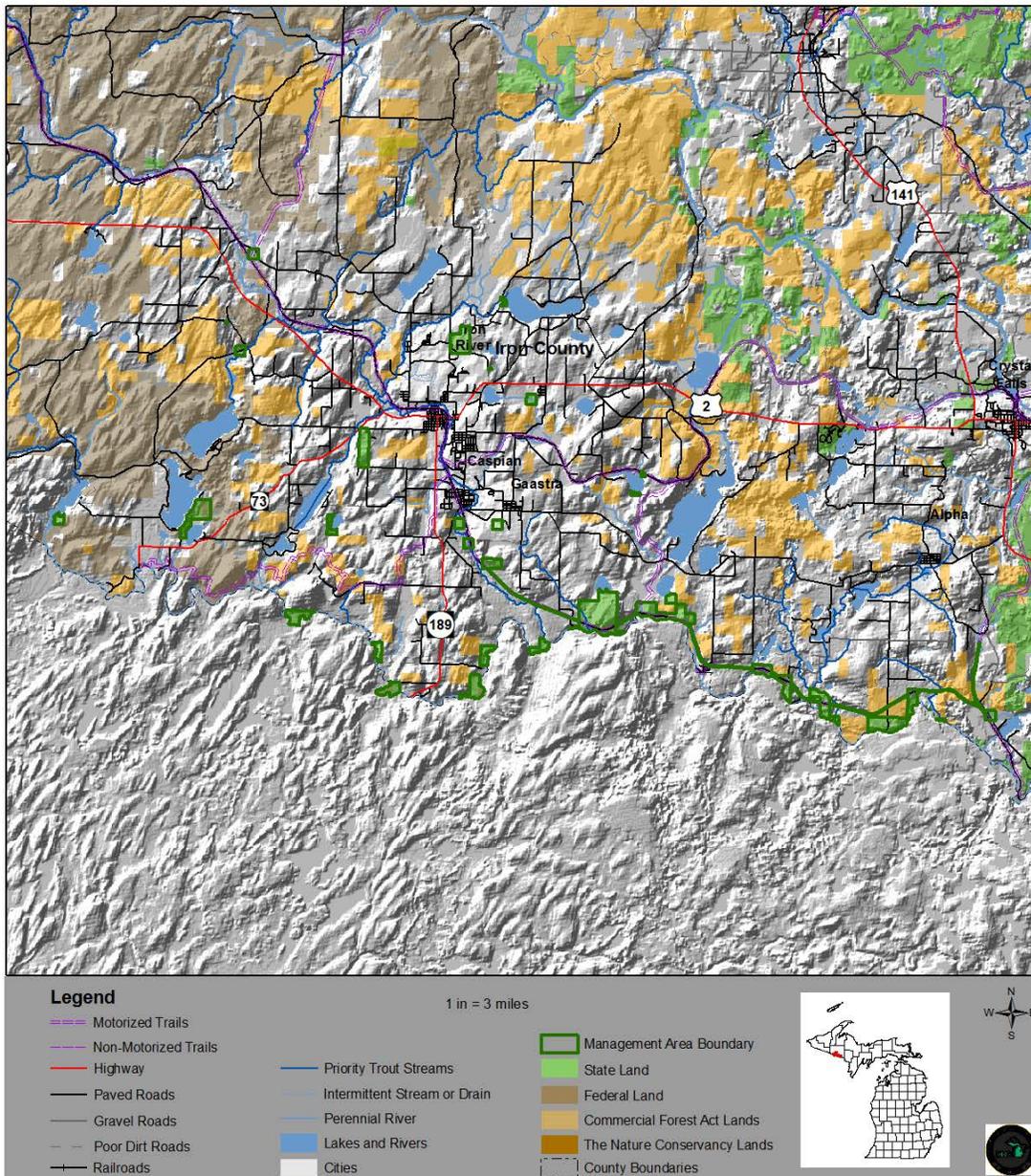


Figure 4.4.1. A map of the Brule/Iron River Tracts management area (dark green boundary) in relation to surrounding state forest and other lands in Iron County, Michigan.

4.4.1 Forest Cover Type Management Direction

The following sections contain information on vegetation management for each of the major cover types, a grouping of minor cover types and important non-forested vegetation types for the Brule-Iron River Tracts management area in the form of Desired Future Condition, 10-Year Management Objectives and Long-Term Management Objectives. This information applies to those portions of the forest where active management (i.e., timber harvest, prescribed fire, planting or mowing) will be conducted. In other portions of the state forest, the natural processes of succession and disturbance

will provide ecological benefits. While most stands have a variety of tree species and other vegetation, they are classified by the species with dominant canopy coverage.

The following cover types are valued commercially for their timber products; ecologically as sources of habitat for numerous wildlife species; and for the variety of recreational opportunities they provide. Harvesting and regenerating these cover types will provide for a continuous flow of forest products and will help to ensure (or provide) wildlife habitat.

Aspen Cover Type

Current Condition

Aspen occurs on 1,726 acres (50%) of the management area (Table 4.4.1). Most of the upland cover types in this management area are found on very productive sites. Age classes are distributed irregularly (Figure 4.4.2). There are 292 acres of aspen that have harvest limitations primarily due to proximity to the Brule River. These hard factor limited acres have been removed from the total number of manageable acres available for harvest calculations. These stands are within the riparian influence zone, often on steep terrain next to the river.

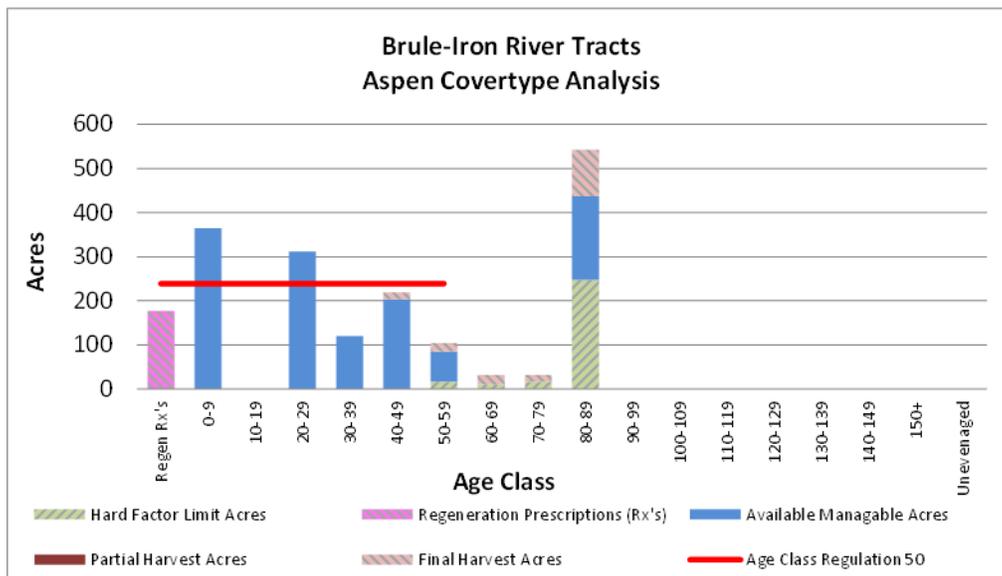


Figure 4.4.2. Graph of the age-class distribution for the aspen cover type on the Brule/Iron River Tracts management area (2012 Department of Natural Resources inventory data).

Desired Future Condition

- Balancing age classes on the widely scattered parcels of state forest land in this management area is a low priority for ecological or economic reasons. The parcels are small and scattered so they do not have a significant influence on the landscape. There is some value in having small niche representatives of various age classes but the value is much lower than it would be where state forest land is a more prominent part of the landscape.

Long-Term Management Objectives

- Harvest and regenerate aspen stands on a 50-year rotation (indicated by the red line in Figure 4.4.2);
- Balanced age classes would provide approximately 239 acres of aspen for harvest every decade; and
- Stands that have limiting factors will most likely succeed to upland spruce/fir types.

10-Year Management Objective

- Over this 10-year planning period, it estimated that 271 acres of aspen would be harvested.

Northern Hardwoods Cover Type

Current Condition

Northern hardwood stands make up 644 acres (19%) of state forest land in this management area (Table 4.4.1). They occur on high-quality sugar maple sites. Most stands have been managed on a selection harvest basis, but have limited regeneration success. Some stands have a well-established sedge understory with little tree regeneration, shrub or herbaceous plant communities. Northern hardwood is typically managed using an uneven-aged harvest system based on basal area rather than age (Figure 4.4.3).

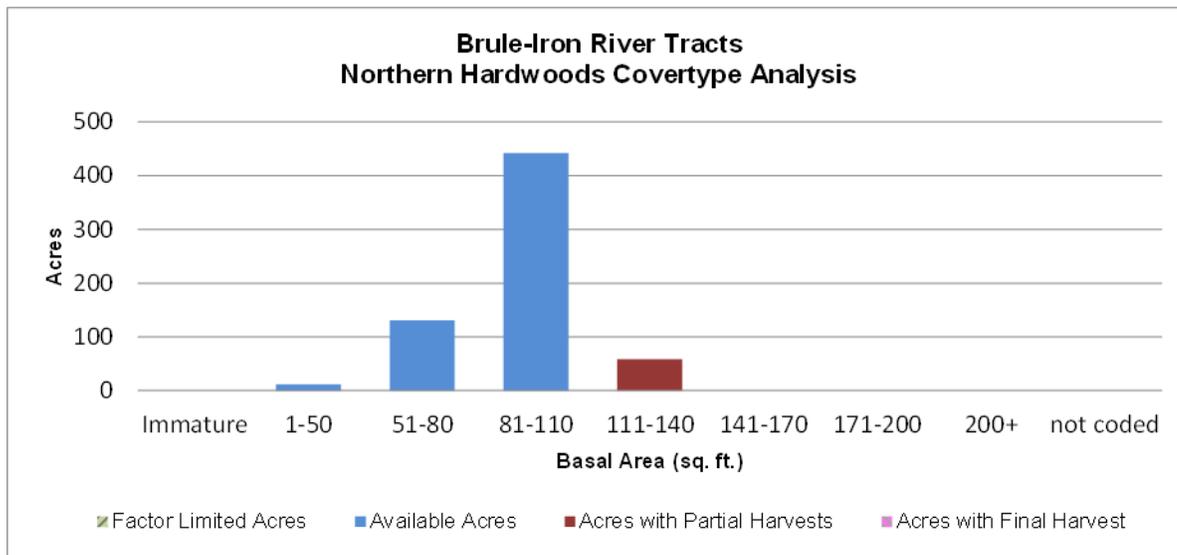


Figure 4.4.3. Graph of the basal area distribution for the northern hardwood cover type on the Brule/Iron River Tracts management area (2012 Department of Natural Resources inventory data).

Desired Future Condition

- Uneven-aged northern hardwood stand structure promoting high value sugar maple sawlogs and veneer with a full complement of tree seedlings recruiting into the overstory, well developed shrub and herbaceous layers.

Long-Term Management Objectives

- Using an uneven-aged system, selective harvest northern hardwood stands on a 20-year cycle producing an estimated 316 acres for harvest each decade; and
- Work to increase hardwood regeneration and reduce the sedge component.

10-Year Management Objectives

- Approximately 316 acres will be select cut in the next decade;
- Maintain hemlock, white pine, oak and upland cedar where they occur in stands that are cut; and
- Experiment with mechanical and chemical treatments of the sedge understory to establish northern hardwood tree regeneration and improve understory diversity.

Lowland Conifers Cover Type

Current Condition

Lowland conifers occur on 198 acres (6%) of the management area (Table 4.4.1). These stands are found on poorly drained sites that support mixed stands of cedar, black spruce, tamarack, balsam fir, white birch and balsam poplar. In this management area, these are widely scattered, small stands. The largest stand is less than 40 acres; all stands averaging only 11 acres. There are 62 acres of lowland conifers that have harvest limitations due to wet conditions or riparian corridors. These hard factor limited acres have been removed from the total number of manageable acres available for harvest calculations. Wet site conditions are susceptible to rutting damage from logging equipment. This presents difficult harvesting conditions. Mixed lowland conifers are poorly distributed across the age spectrum. Nearly 90% of the stands are between 80 and 110 years old (Figure 4.4.4).

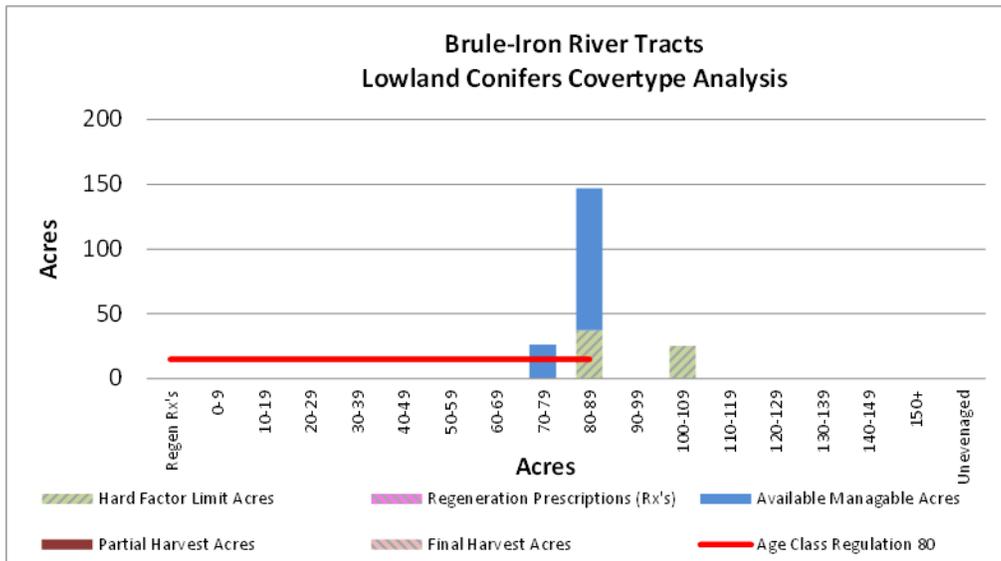


Figure 4.4.4. Graph of the age-class structure for the lowland conifer cover type on the Brule/Iron River Tracts management area (2012 Department of Natural Resources inventory data).

Desired Future Condition

- Closed canopy stands interspersed with patches of all age classes;
- Sustainable regeneration and recruitment of seedlings and saplings;
- Maintain the closed canopy structure to provide important winter deer habitat; and
- Plan to harvest the oldest available stands to regenerate them before widespread mortality occurs.

Long-Term Management Objectives

- Manage stands on an 80-year rotation providing 15 acres of final harvest each decade;
- Regenerate stands to species mixes similar to the pre-harvest conditions with preference for cedar, black spruce and balsam fir;
- Harvesting will be done using small clearcuts or strips with clumped retention; and
- Lowland conifer stands in areas inaccessible for harvest will be subject to natural processes, resulting in a range of successional stages.

10-Year Management Objectives

- Over the next 10 years, it estimated that 53 acres of lowland conifer will be harvested (this is more than the regulated amount due to the current age-class structure where all stands are over 70 years old);
- Stands will be monitored for increased mortality due to the general over mature condition;
- When mortality occurs decisions will be made as to the priority of salvaging and regenerating young, vigorous stands or leaving them to natural, small patch replacement processes;
- Use appropriate silvicultural techniques to assure adequate regeneration of desirable species; and
- Monitor harvested sites.

Other Forested Cover Types

Current Condition

Other forested types make up 266 acres and are made up of tamarack (77 acres), lowland poplar (64 acres), lowland spruce/fir (50 acres), cedar (27 acres), upland spruce/fir (27 acres), and lowland deciduous (21 acres). Together these types make up 8% percent of the management area (Table 4.4.1).

Approximately 118 acres of these other minor cover types have site conditions limiting their harvest this decade. These hard factor limited acres have been removed from the total number of manageable acres available for harvest calculations.

Desired Future Condition

- Maintain the presence of the minor cover types within the management area.

Long-Term Management Objectives

- Manage minor cover types to maintain representation using appropriate silvicultural methods;
- Monitor to assure adequate regeneration of desired species;
- Featured species habitat requirements will be taken in to consideration; and
- Where stands have site conditions limiting harvest, early successional cover types will be lost through natural succession.

10-Year Management Objectives

- Harvest those stands without harvest limitations adjacent to other planned harvest activities and where stand and habitat conditions indicate that harvesting is appropriate; and
- Expected harvests in these types will be total approximately 55 acres over the next decade.

Other Non-forested Cover Types

Current Condition

Non-forested cover types found on this management area include: upland open/semi - open lands (266 acres – 8%), lowland open/semi-open lands (216 acres – 6%) and other (water, local, urban) (150 acres – 4%).

Desired Future Condition

- These areas will be maintained in the current condition.

Long-Term Management Objectives

- Grass (herbaceous open land) will be burned or mowed to prevent forest encroachment.

10-Year Management Objective

- Grass-types will be treated for opening maintenance as needed.

4.4.2 – Featured Wildlife Species Management

Several state forest compartments in this management area lie along the Brule River and are adjacent to the Whisker Lake Wilderness on the Chequamegon-Nicolet National Forest and collaborative management opportunities with the U.S. Forest Service should be explored. It is a priority to maintain large tracts of mature forest, particularly along this riparian corridor. The primary focus of wildlife habitat management in the Brule-Iron River Tracts management area will be to address the habitat requirements identified for the following featured species: American marten, black bear, northern goshawk and wood duck. Some of the most significant wildlife management issues in the management area are habitat fragmentation; coarse woody debris; mesic conifer; mature forest; and mast (hard and soft). During this 10-year planning period, additional analyses to better define the spatial extent of priority areas (e.g., large suitable patches of contiguous habitat and dispersal corridors for marten) for featured species will be performed.

American Marten

The goal for marten is to maintain or increase suitable habitat and strive to identify, maintain and connect known populations to facilitate genetic exchange. Management during this planning period should focus on providing mature conifer forest conditions (e.g., coarse woody debris and large living cavity trees) across cover types in marten habitat.

Wildlife habitat specifications:

- Maintain a minimum of 30% canopy cover in key even-aged managed stands of northern hardwood and conifer stands as marten tend to avoid stands with less canopy cover. Retention patches should be oriented to minimize potential blow down.
- Discourage land transactions and management activities that facilitate additional fragmentation of marten habitat by identifying and maintaining corridors between large forested tracts (e.g., Huron Mountains, Craig Lake State Park, McCormick Wilderness, portions of The Nature Conservancy's Northern Great Lakes Forest Project and several smaller natural areas) west to Ottawa National Forest and south Chequamegon-Nicolet National Forest (WI) and Whisker Lake Wilderness.
- Provide late successional conifer-dominated stands in this management area.
- Provide for late successional mesic conifer-dominated stands in the area by extending the normal rotation length for white spruce and balsam fir cover types by 20 years.
- Retain down coarse woody debris present before cutting, and debris resulting from incidental breakage of tops and limbs in the general harvest area, except on skid trails and landings, to the extent feasible. Where coarse woody debris is lacking, increase both standing dead and down dead wood by leaving at least three secure large diameter (>14 inches in diameter at breast height) live trees to serve as future den trees, snags, and coarse woody debris and logs on the ground per acre harvested.
- Limit biomass harvesting, whole tree chipping and limit firewood permits and retain the maximum residues in the Woody Biomass Harvesting Guidelines within this management area.
- Increase the within-stand component of mesic conifers in forested stands and manage to increase mesic conifer forest types by group or gap selective harvest. Consider under planting on suitable sites where a seed source is absent.

Black Bear

The western Upper Peninsula black bear goal is to maintain or improve habitat. Management for bear should focus on improving existing habitat (e.g., maintaining corridors, mast and refuge trees) in this management area.

Wildlife habitat specifications:

- Maintain or increase the oak cover type and within stand oak component of hardwood forests within the management area;
- Maintain or increase mast by providing forest clearings that promote food sources such as pin cherry, juneberry/serviceberry, hazel, raspberry, blackberry and blueberry;
- Minimize herbicide use that would be detrimental to mast production;
- Maintain lowland conifer and hardwoods along and around drainages, vernal pools and forested wetlands; and
- Maintain refuge tree species with rough bark to provide escape cover for cubs (e.g., white pine and hemlock).

Northern Goshawk

The goal for northern goshawk is to maintain suitable habitat. Management at the stand scale should focus on protection of nest trees, the provision of coarse woody debris and on addressing fragmentation. Landscape scale management should provide mature and old aspen stands in the 60-70 year-old age category.

Wildlife habitat specifications:

- Maintain a minimum of 15% of the state forest aspen resource above the age of 60 in this management area (this can be accomplished using factor limited stands, special conservation areas, etc...). All known woodland raptor nests should be reported to local wildlife staff and documented in the Integrated Forest Monitoring Assessment and Prescription comments. If the species is known, the common name should be included in the comments. For northern goshawk nests, the wildlife habitat specifications contained within Michigan DNR's *Interim Management Guidance 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.

White-tailed Deer

The western 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 wooly 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.

Wood Duck

The western Upper Peninsula goal for wood duck is to maintain or increase suitable habitat. Management should focus on the protection of forest wetland, riparian corridors, providing large cavity trees, mast and the management of priority wildlife management areas with suitable habitat.

Wildlife habitat specifications:

- In landscapes that contain streams, beaver ponds and other potential habitat for wood ducks, provide potential nesting sites by providing mature forest (possibly special conservation area designations) and/or big-tree silviculture near water.
- Retain all large diameter over-mature cavity trees within 300 feet of water bodies for cavities in lowland and upland hardwoods. Where adjacent forest is young or cavities limited, nest trees should be promoted.
- Where appropriate, manage for mast in riparian areas.
- Increase potential riparian buffers to 300+ feet, where desired, instead of the standard 100 foot best management practice.

4.4.3 –Rare Species and Special Resource Area Management

All forest operations must be reviewed for potential conflicts between rare species and proposed forest operations 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, when past surveys have indicated a possibility of their presence, or when appropriate habitat is available and the species is known to occur in the general region.

Past surveys have noted and confirmed six listed species and no natural communities of note occurring in the management area as listed in Table 4.4.2. 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.

There are no high conservation value areas or ecological reference areas identified in this management area as illustrated in Figure 4.4.5.

Management goals during this planning period:

Goal 1: To develop and maintain a list of rare, threatened, endangered and special concern species and natural communities for the management area through a continuous inventory and through opportunistic focused inventory surveys.

Objective 1-1: Field staff should be trained and aware of the identification characteristics and natural history of rare, threatened, endangered and special concern species.

Objective 1-2: Occurrences of rare, threatened, endangered and special concern species noted during the inventory process by inventory staff should be verified and added to the body of knowledge for the management area.

Table 4.4.2. Occurrence information for special concern, rare, threatened and endangered communities and species for the Brule-Iron River Tracts management area.

Common Name	Scientific Name	Status	Status in Management Area	Climate Change Vulnerability Index (CCVI)	Confidence	Natural Community Association	Probable Cover Types	Successional Stage
Birds								
Northern goshawk	<i>Accipiter gentilis</i>	SC/G5/S3	Confirmed	PS	Very High	Mesic northern Forest	Northern Hardwood	Late
						Hardwood-conifer swamp	Lowland Mixed	Mid
						Northern hardwood swamp	Black Ash	Late
						Floodplain forest	Lowland mixed	Mid
						Dry northern forest	Jack Pine, Red Pine	Late
						Dry-mesic northern forest	White Pine	Late
						Boreal forest	Upland & Lowland Sp/F	Mid
Common loon	<i>Gavia immer</i>	T/G5/S3-4	Confirmed	HV	Very High	Emergent Marsh	Lowland open/semi-open	N/A
						Bog	Lowland open/semi-open	N/A
Bald eagle	<i>Haliaeetus leucocephalus</i>	SC/G5/S4	Confirmed	IL	Moderate	Bog	Lowland open/semi-open	N/A
						Hardwood-conifer swamp	Lowland Mixed	Mid
						Northern hardwood swamp	Black Ash	Late
						Poor conifer swamp	Tamarack	Late
						Floodplain forest	Lowland mixed	Mid
						Dry northern forest	Jack Pine, Red Pine	Early
						Dry-mesic northern forest	White Pine	Late
Osprey	<i>Pandion haliaetus</i>	SC/G5/S2-3	Confirmed	PS	Low	Mesic northern Forest	Northern Hardwood	Late
						Coastal fen	Lowland open/semi-open	N/A
						Northern hardwood swamp	Black Ash	Late
						Floodplain forest	Lowland Mixed	Mid
						Hardwood-conifer swamp	Lowland Mixed	Mid
Dragonfly								
Extra-striped snaketail	<i>Ophiogomphus anomalus</i>	SC/G4/S1	Confirmed	PS	Very High	Headwater & Mainstem Stream	Aquatic	N/A
Reptile								
Wood turtle	<i>Glyptemys insculpta</i>	SC/G4/S2S3	Confirmed	MV	Moderate	Northern wet meadow	Lowland open/semi-open	N/A
						Bog	Lowland open/semi-open	N/A
						Rich conifer swamp	Tamarack	Late
						Hardwood-conifer swamp	Lowland Mixed	Mid
						Northern shrub thicket	Upland open/semi-open	N/A
						Mesic northern forest	Northern Hardwood	Late

Climate Change Vulnerability Index: EV – Extremely Vulnerable; HV – Highly Vulnerable; MV – Moderately Vulnerable; PS – Presumed Stable; and IL – Increase Likely.

4.4.4 – 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 area include:

- White trunk rot of aspen
- *Hypoxylon* canker
- Emerald ash borer
- Spruce budworm.

When forest pests are detected, they are to be reported to the forest health specialist for treatment recommendations. The treatment of large outbreaks of forest pests will be coordinated on a state and regional level.

Several invasive exotic species of plants are thought to be located in the vicinity. When invasive species are detected, they will be reported to the forest health specialist and treatment options will be reviewed. Priority for treatment should be given to those species that threaten sensitive sites due to their location or growth characteristics and have population levels that may be successfully controlled. Following is a list of species of concern that been documented in or near this management area:

- Bell's honeysuckle
- Canada thistle
- Common buckthorn
- Common St. John's-wort
- Crack willow
- European swamp thistle
- Garlic mustard
- Japanese barberry
- Japanese knotweed
- Narrow-leaved cat-tail
- *Phragmites*
- Purple loosestrife
- Reed canary grass
- Scots pine
- Spotted knapweed
- Tatarian honeysuckle.

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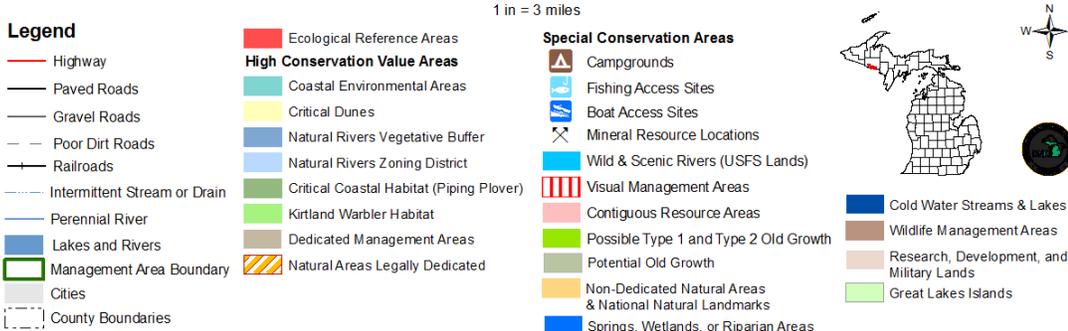
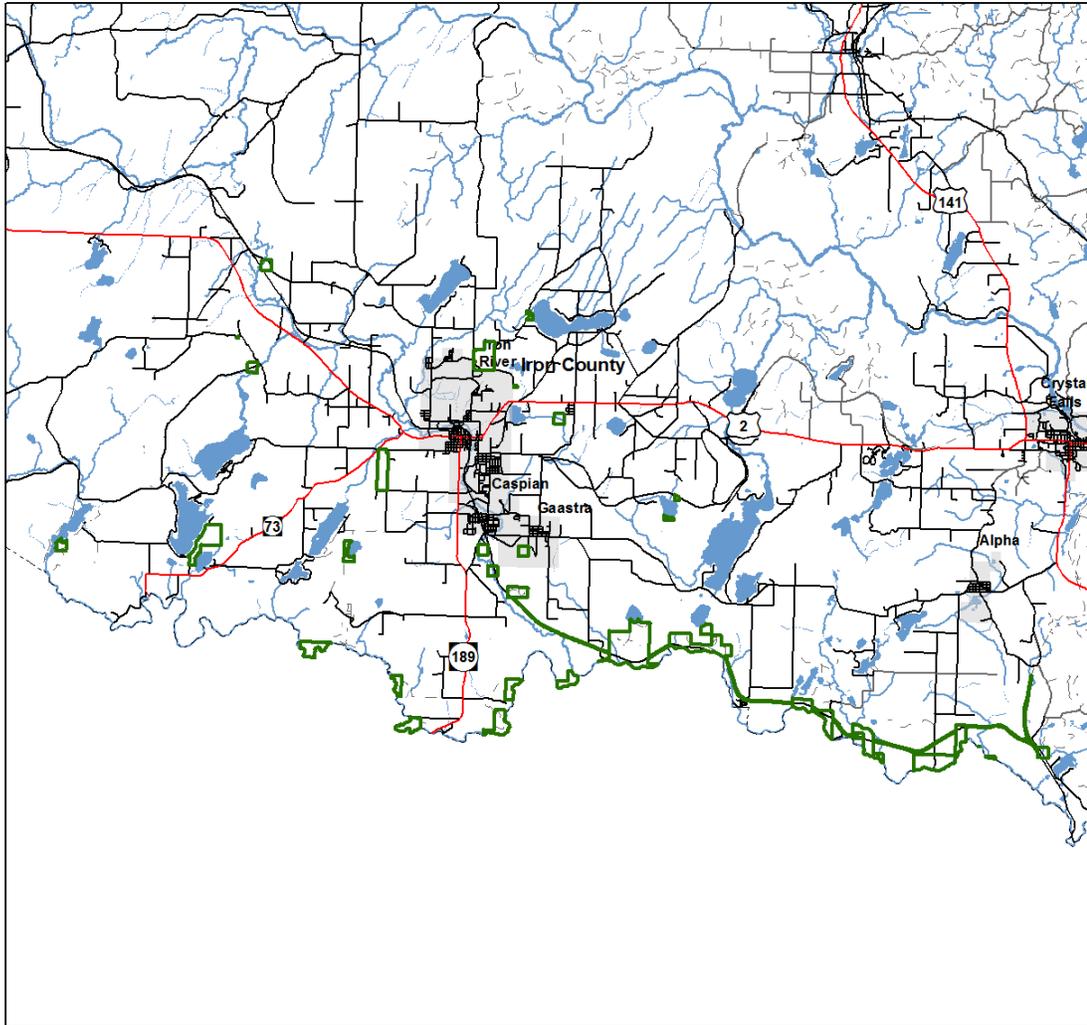


Figure 4.4.5. A map of the Brule-Iron River management area showing the special resource areas.

4.4.5 – 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. Western Upper Peninsula Regional State Forest Management Plan MA 4 Brule-Iron River

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. Designated high priority trout streams are identified in the Integrated Forest Monitoring Assessment and Prescription Geographic Decision Support Environment. Remove or discourage beaver populations on designated high priority trout streams.

High priority trout streams in this management area are shown in Figure 4.4.1.

4.4.6 – Fire Management

Fire probably did not play a significant role in this largely mesic northern forest community.

- All wildfires are subject to appropriate initial attack suppression response.

4.4.7 – Public Access and Recreation

This area follows the Brule River on the south, a popular fishing and canoeing/kayaking river that border Wisconsin. The state forest is in isolated parcels, surrounded by private land and has some undivided interest limiting public access opportunities. A snowmobile trail crosses this area (Figure 4.4.1). There are no state forest campgrounds. Boating access sites are located on the Brule River. Maintain current management access.

- Work to expand public access as opportunities arise.

4.4.8 – Oil, Gas and Mineral Resources

Exploration and development for oil and gas has been limited to a few wells drilled in the eastern Upper Peninsula and no economic oil and gas production has been found anywhere in the Upper Peninsula.

Surface sediments consist of glacial outwash sand and gravel and postglacial alluvium and coarse-textured till. There is insufficient data to determine the glacial drift thickness. Sand and gravel pits are located in the management area and there is potential on the uplands.

The Precambrian Michigamme and Quinnesec Formations, Badwater Greenstone and Paint River Group subcrop below the glacial drift. There is no current economic use for these rocks.

Old iron mines are located in this area. Metallic mineral exploration has occurred in this general area and there could be potential. The parcels located along the Menominee River would be less likely to be leased.