



Compartment Review Presentation

Grayling Forest Management Unit

Compartment 72212

Entry Year 2019

Acreage: 1,793

County Crawford

Management Area: Grayling Ice Contact

Revision Date: 2017-09-05

Stand Examiner: Matthew Foster

Legal Description:

T28N R04W Sections 2, 10, 11, 14, 15 Frederic Township

Identified Planning Goals:

To improve forest health, productivity, sustainability, and account for species and structural diversity throughout the State of Michigan by actively managing flora and fauna, while providing for multiple use, and visual management.

Soil and topography:

Sections 2, 10, and 15 are extremely hilly. Section 14 is relatively flat with lowland areas around the creeks. The soils are a Rubicon-Kalkaska-Blue Lake association, which are excessively to well drained sandy soils.

Ownership Patterns, Development, and Land Use in and Around the Compartment:

Ownership north and east of the compartment is private. The rest of 28N 04W is mostly public land with scattered private tracts. Oil and gas development is evident throughout the area. The state currently does not have legal access to the public land in Section 2.

Unique Natural Features:

Kolka Creek and Bradford Creek are designated "Natural Rivers". These rivers and surrounding stands are known as "High Conservation Value Areas" (HCVA). The high ground between the two creeks currently has access using a temporary bridge that is installed over Kolka Creek. This bridge will be removed when the timber harvest is complete.

Archeological, Historical, and Cultural Features:

The old Mt. Fredric Ski Area is located in this compartment in Section 10. All of the public land in section 10 was gifted to the State of Michigan from the Shell Oil Company.

Special Management Designations or Considerations:

Kolka and Bradford Creeks run through Section 14. These two creeks are designated "Natural Rivers". All guidelines pertaining to "Natural Rivers" and surrounding stands should be followed. There is potential for goshawk and red-shouldered hawk to occur. The riparian areas are suitable habitat for wood turtles, Blanding's turtles, and the Eastern Massasauga rattle snake.

Watershed and Fisheries Considerations:

Conversion to early successional cover types along Kolka and Bradford Creek in this compartment is not recommended.

Wildlife Habitat Considerations:

The hardwood stands found in the area with their enclosed canopies and relatively open under story provide excellent habitat for woodland raptors. There are several early successional aspen cover types found throughout the compartment which provide cover and browse. This compartment contains grassy openings which may benefit from opening maintenance activities.

Mineral Resource and Development Concerns and/or Restrictions

The state-owned Kolka Creek gravel pit is located in Section 15, and there is good potential for additional sand and gravel production on the upland areas within the compartment. All of the state mineral interests in the compartment are currently leased and held by production. The state does not own the mineral rights in Section 10. The compartment has been developed for Antrim Shale gas and Guelph (Niagaran) reefs. There is some potential for additional development from both formations. There is no known metallic mineral potential in this part of the state.

Vehicle Access:

Access is adequate and no new roads are needed. The steep terrain and sandy nature of some of the trail roads may make accessed without 4-wheel drive difficult. The high ground between Kolka and Bradford Creeks is currently access by a temporary bridge. Heavy illegal ORV use has occurred on and around Mt. Frederic, leaving a myriad of illegal sandy trails

that are eroding. Trees have been planted and barricades have been installed to slow down the illegal activity.

Survey Needs:

None at this time.

Recreational Facilities and Opportunities:

Snowmobile Trail #679 is found in the southern part of Section 15 and Snowmobile Trail #7 runs along Old-27. The planned Iron Belle Trail will also extend as a separate non-motorized corridor near edge of N. Old 27 Road Right of Way. Due to the proximity to Frederic and water resources within this compartment receives heavy dispersed recreational use occurs throughout the year from hunting, gathering (mushrooms, berry picking) and fishing. Historically illegal ORV use has occurred on and around Mt. Frederic. Continue to use forest management techniques to reduce illegal activity and damage to natural resources.

Fire Protection:

Most of the cover types within this compartment are not prone to frequent fire events. Due to the large amount of pipelines (some containing sour gas) standard operations with plow lines may not be the best choice for resource protection. The hilly topography would most likely limit the effectiveness of the majority of equipment as well. The major roads and creeks in this compartment should serve as adequate fuel breaks for normal or expected fire intensities in this area.

Additional Compartment Information:

The extensive gas operations and the corridors created by them, have encouraged several invasive species such spotted knapweed and St. Johns Wort to become established throughout the disturbed areas of the compartment.

The following reports from the Inventory are attached:

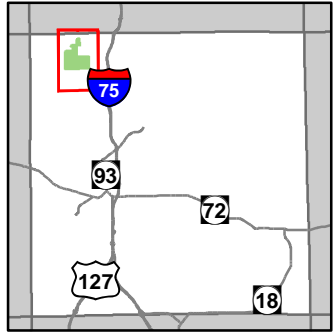
- Total Acres by Cover Type and Age Class**
- Cover Type by Harvest Method**
- Proposed Treatments – No Limiting Factors**
- Proposed Treatments – With Limiting Factors**
- Stand Details (Forested and Nonforested)**
- Dedicated and Proposed Special Conservation Areas**
- Site Condition Details**

The following information is displayed, where pertinent, on the attached compartment maps:

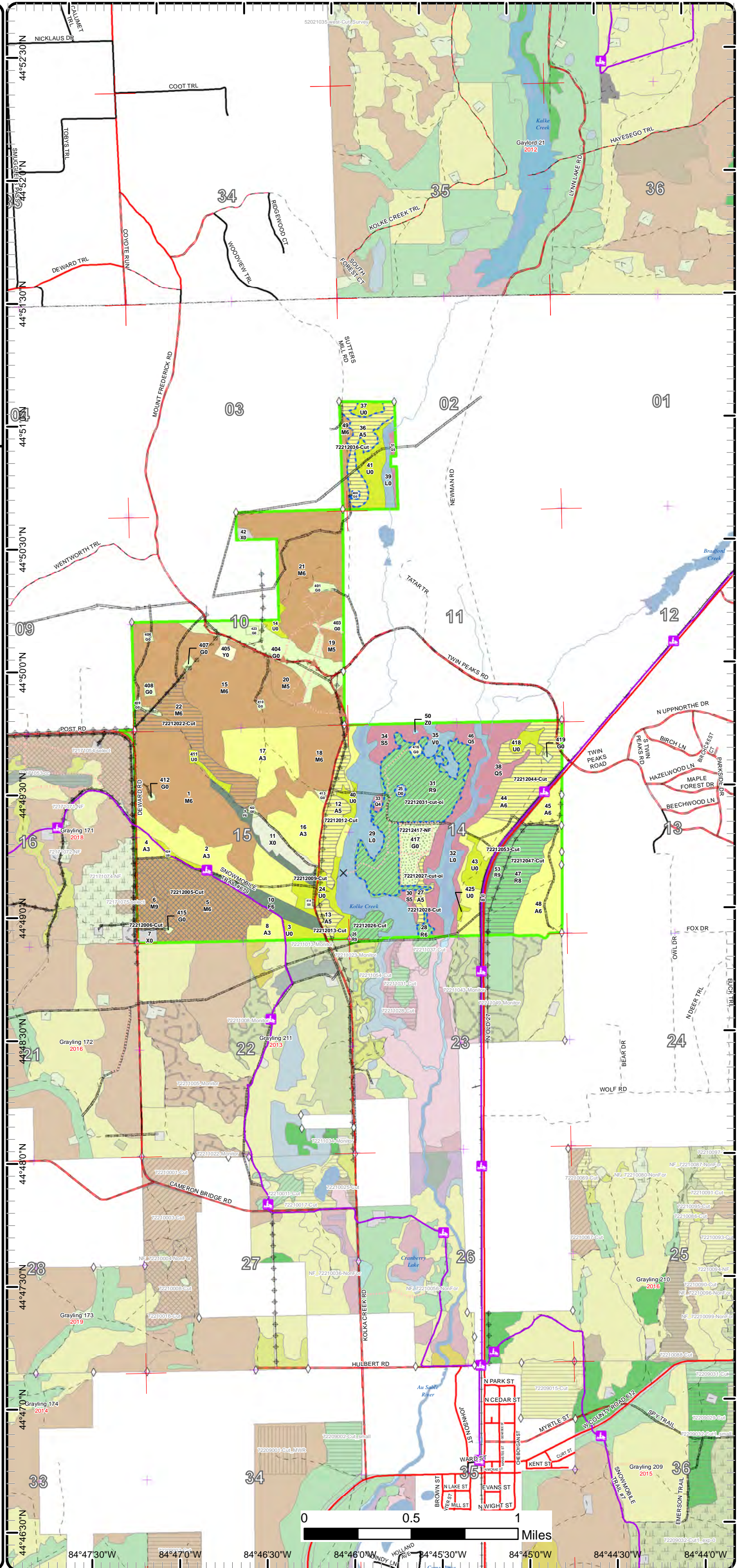
- Base feature information, stand boundaries, cover types, and numbers**
- Proposed treatments**
- Site condition boundaries**
- Details on the road access system**

Cover Type & Treatments Map

Compartment: 212
 T28N,R04W, Sec. 02, 10, 14-15
 County: Crawford
 Unit: Grayling
 Mgmt Area: Grayling Ice Contact
 YOE: 2019
 Acres: 1793.3 GIS Calculated
 Examiner: Matthew Foster
 Map Revised: 3/5/2018
 Map Phase: Post-Review

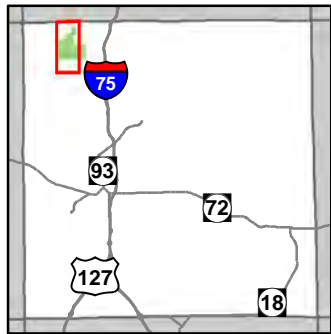


- Miris Corners
- + Remonumented Section Corners
- ◇ Field Grade GPS Corners
- Counties
- × Gate
- ▲ Berms
- ⚡ Snowmobile Trails
- ⚡ Designated Snowmobile Trails
- County Paved Roads
- Paved Roads
- County Gravel Roads
- Gravel Roads
- County Poor Dirt Roads
- Poor Dirt Roads
- Closed
- Active Railroads
- Streams
- Lakes and Rivers All
- Pipeline
- Powerline
- Compartment Boundary
- Treatments with Site Conditions
- ▨ Selection (Group, Single Tree)
- ▨ Clearcut (w/Reserves)
- ▨ Thinning (Crown, Low, Systematic)
- ▨ Mowing
- 411 - Northern Hardwood
- 413 - Aspen
- 421 - Planted Pines
- 423 - Other Upland Conifers
- 612 - Lowland Coniferous Forest
- 110 - Low Intensity Urban
- 122 - Roads/Parking Lot
- 310 - Herbaceous Openland
- 330 - Low Density Trees
- 500 - Water
- 622 - Lowland Shrub
- 710 - Sand/Soil
- 790 - Other Bare/Sparsely Vegetated
- Lakes

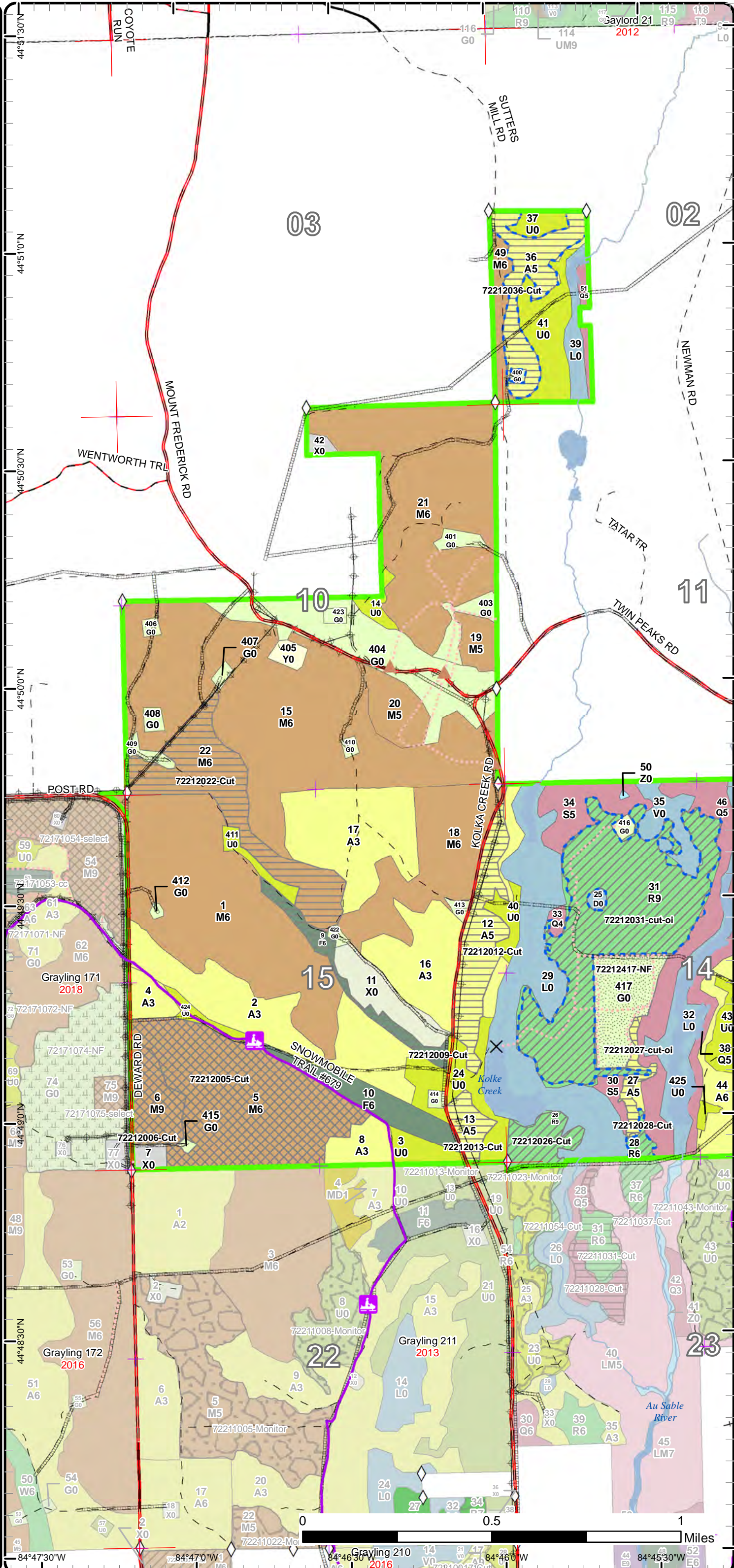


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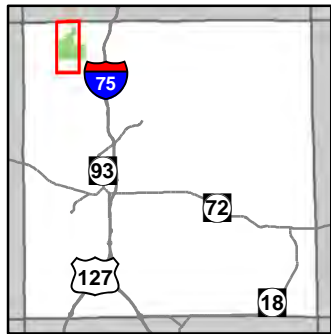


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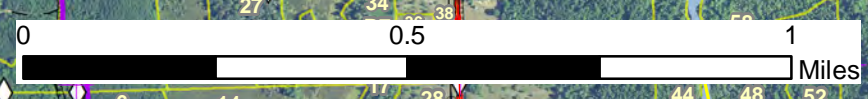
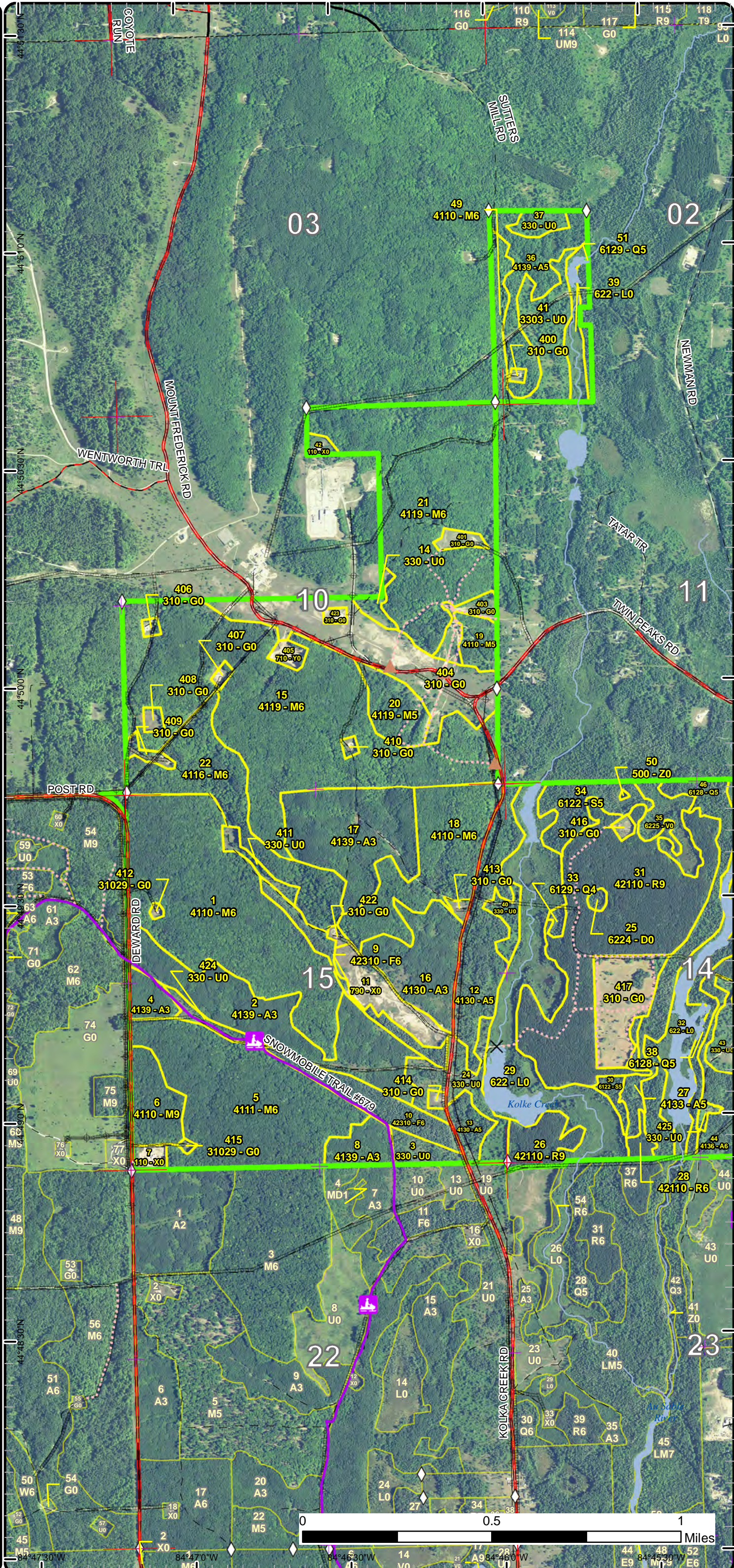


Stand Boundary Map

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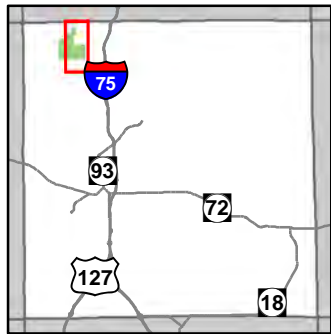
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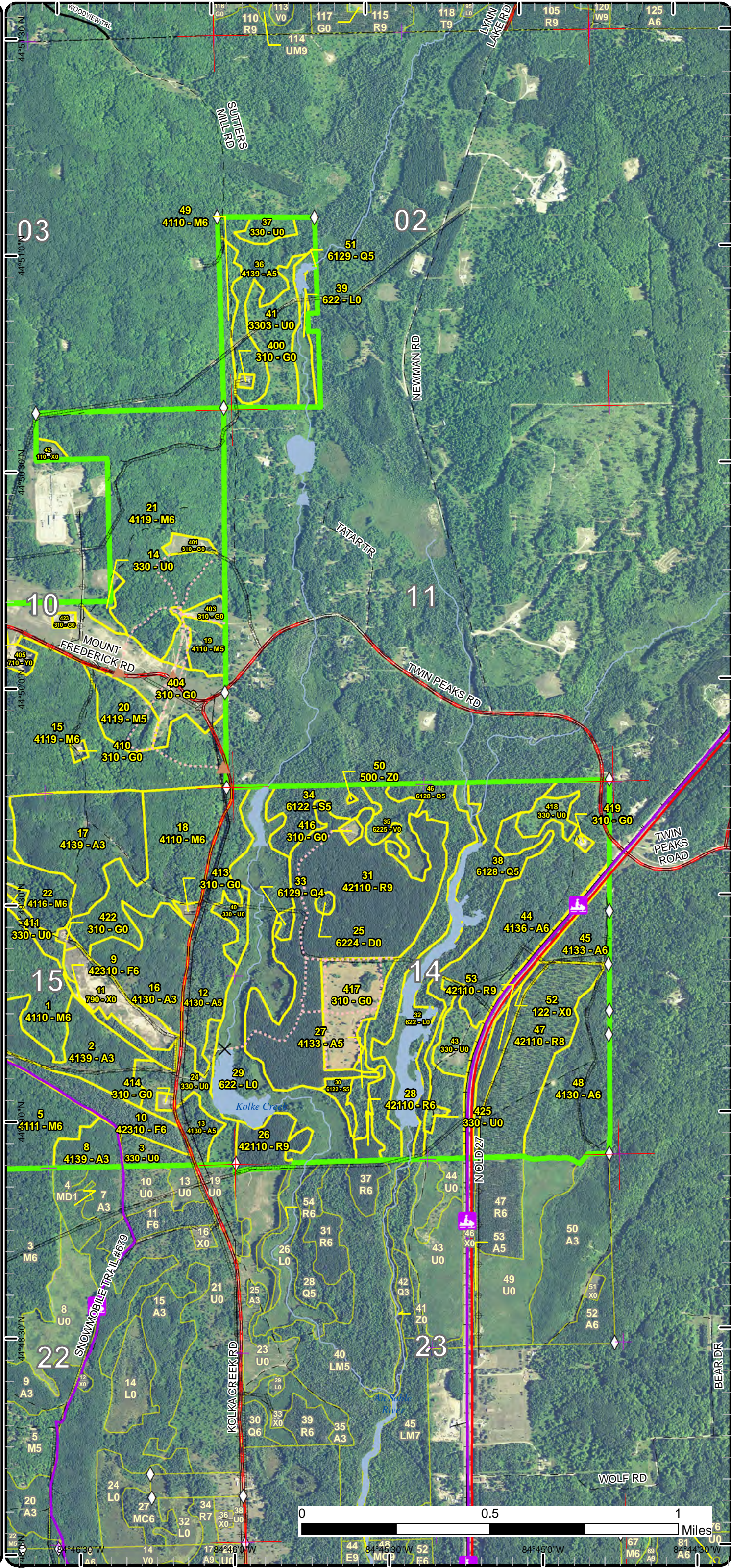
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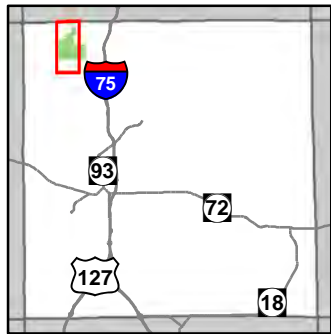
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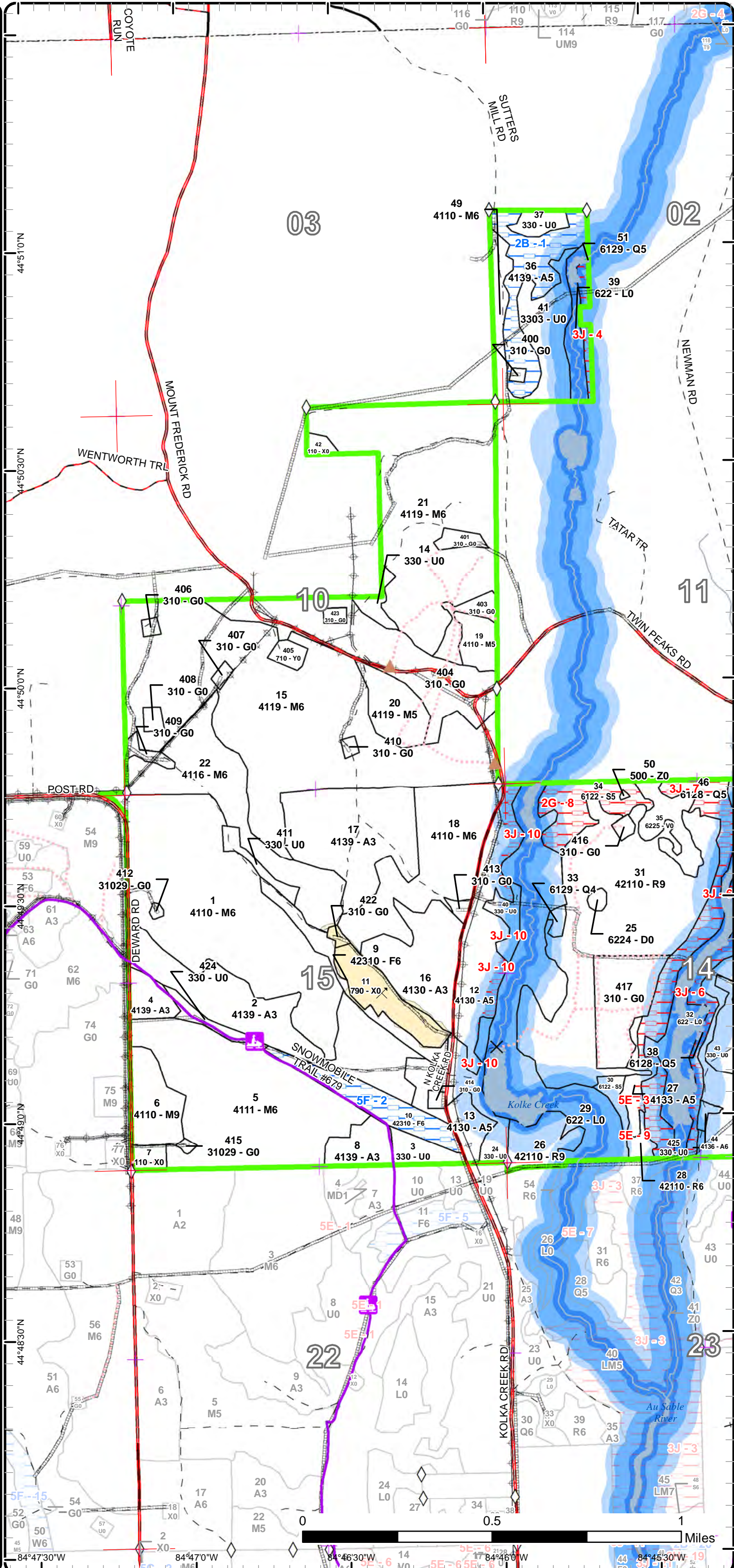
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Special Conservation Areas & Site Conditions Map

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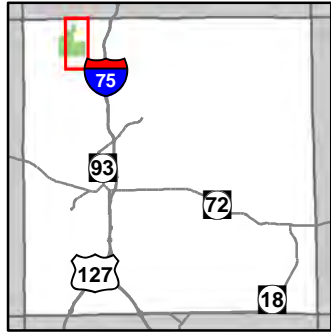
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- Compartment Boundary
- Available w/ Constraints
- Unavailable
- 2G: Too wet (sensitive soils, does not include access issues)
- 3J: Water quality / BMPs (stream, river, or lake)
- 5E: Long-Term Retention
- Stand Boundaries
- Natural Rivers Vegetative Buffer
- Natural Rivers Zoning District
- Cold Water Streams
- High Priority Trout Stream Buffer
- Sand or Gravel Pit
- Sand or Gravel Pit



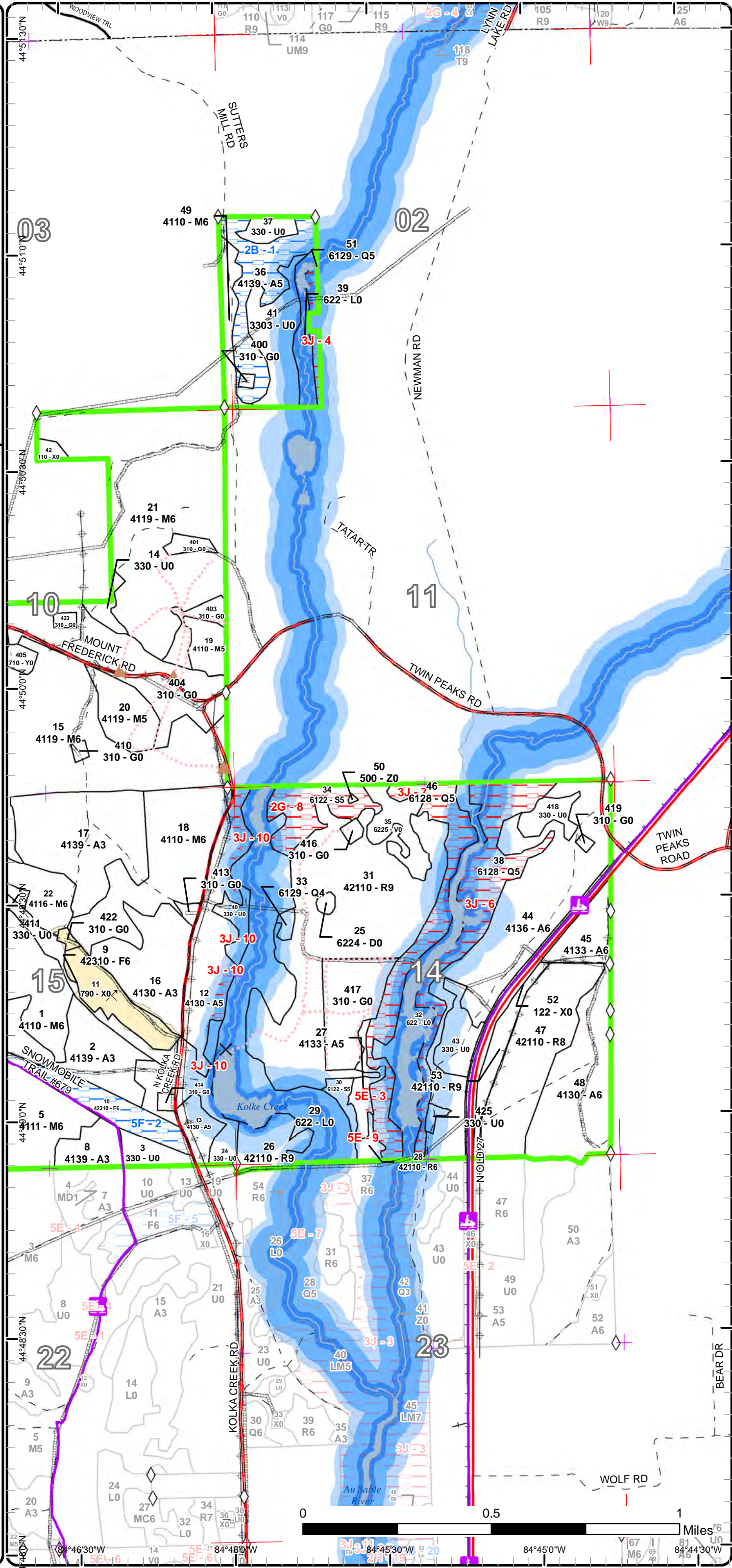
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Age Class

	Non-Forest	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100-109	110-119	120-129	130-139	140-149	150+	Uneven-Aged	Total
Aspen	0	0	105	60	0	60	87	46	37	0	0	0	0	0	0	0	0	0	395
Bare/Sparsely Vegetated	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18
Bog	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13
Herbaceous Openland	110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	110
Low-Density Trees	98	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	98
Lowland Conifers	0	0	0	0	0	0	2	0	0	43	44	0	0	0	0	0	0	0	89
Lowland Shrub	123	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	122
Lowland Spruce/Fir	0	0	0	0	0	0	0	0	0	22	0	0	0	0	0	0	0	0	22
Northern Hardwood	0	0	0	0	0	0	0	0	312	347	0	0	0	0	0	0	0	18	677
Red Pine	0	0	0	0	0	0	0	191	0	0	0	0	0	0	0	0	0	0	191
Sand, Soil	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Treed Bog	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Upland Spruce/Fir	0	0	0	0	0	0	31	0	0	0	0	0	0	0	0	0	0	0	31
Urban	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22
Water	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	389	0	105	60	0	60	120	237	349	412	44	0	0	0	0	0	0	18	1793



Report 2 – Treatment Summary

Grayling Mgt. Unit

Year of Entry: 2019

Acres of Harvest

Compartment 212

Total Compartment Acres: 1,793

Commercial Harvest - 348
 Harvests with Site Condition - 141
 Next Step Harvest - 0
 Habitat Cut - 0

Cover Type by Harvest Method

	Clearcut	Selection	Patch Clearcut	Seed Tree	Shelterwood	Thinning	Overstory Removal	Salvage	Other	Total Acres
Aspen	128	0	0	0	0	0	0	0	0	128
Lowland Conifers	0	0	0	0	0	3	0	0	0	3
Northern Hardwood	51	112	0	0	0	0	0	0	0	163
Red Pine	59	0	0	0	0	123	0	0	0	182
Upland Spruce/Fir	12	0	0	0	0	0	0	0	0	12
Total	250	112	0	0	0	127	0	0	0	489

Proposed and Next Step Treatments by Method

	Harvest	Site Prep	Planting	Seeding	Burning	Pesticide	Monitoring	Other	Non-Forest Mgt.	Total Acres
Current	489	0	0	0	0	0	42	0	25	557
Next Step	0	118	59	0	0	59	416	0	0	652
Total	489	118	59	0	0	59	458	0	25	1208



S t a n d	Treatment Name	Acres	Stand CoverType	Size Density	Stand Age	BA Range	Treatment Type	Treatment Method	Cover Type Objective	Age Structure	Approval Status
5	72212005-Cut	94.0	4111 - S.Maple, Hard Mast Association	Poletimber Well	86	111-140	Harvest	Group Selection	411 - Northern Hardwood	Two-Aged	Draft Field Boundary

Habitat Cut: No

Site Condition:

Prescription Remove approximately 30% of the stand through group selection harvest. Gaps should have a minimum diameter of 100ft. Add snowmobile trail
Specs: protection specs.

Next Step Monitoring, Natural Regen (Intermediate)
Treatments:

Acceptable Moderate stocking of northern hardwoods in the gaps that were created.
Regen:

Other
Comment:

Proposed Start Date: 10/01/2018

6	72212006-Cut	18.4	4110 - Sugar Maple Association	Sawtimber Well	91	111-140	Harvest	Single Tree Selection	411 - Northern Hardwood	Uneven-Aged	Draft Field Boundary
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Habitat Cut: No

Site Condition:

Prescription Thin stand down to 80 BA, focus on removing large hard maple (16"-20"DBH) and releasing potential crop trees. Create regeneration gaps in the
Specs: areas with the larger hard maple.

Next Step Monitoring, Natural Regen (Intermediate)
Treatments:

Acceptable Moderately stocked northern hardwoods in the regeneration gaps.
Regen:

Other
Comment:

Proposed Start Date: 10/01/2018

9	72212009-Cut	12.2	42310 - Planted Spruce	Poletimber Well	53	Unspecified	Harvest	Clearcut with Retention	790 - Other Bare/Sparsely Vegetated		Draft Field Boundary
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Habitat Cut: No

Site Condition:

Prescription Final harvest to allow for expansion of leased gravel pit (Stand 11). Leave retention at the north end away from the gravel pit expansion (along
Specs: Stand 411).

Next Step Monitoring, Natural Regen (Re-Inventory)
Treatments:

Acceptable Bare soil for pit expansion.
Regen:

Other Check with Unit Manager at time of timber sale prep to make sure the county still plans to expand the gravel pit.
Comment:

Proposed Start Date: 10/01/2018

12	72212012-Cut	31.0	4130 - Aspen	Poletimber Medium	66	Unspecified	Harvest	Clearcut with Retention	413 - Aspen	Even-Aged	Draft Field Boundary
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Habitat Cut: No

Site Condition:

Prescription Final harvest with retention, apply drumming log spec and protect wildlife shrubs. Buffer along Kolka Creek should also serve as retention for the
Specs: stand. Follow standard BMP's.

Next Step Monitoring, Natural Regen (Re-Inventory)
Treatments:

Acceptable Aspen, mixed hardwood.
Regen:

Other
Comment:

Proposed Start Date: 10/01/2018



S t a n d	Treatment Name	Acres	Stand CoverType	Size Density	Stand Age	BA Range	Treatment Type	Treatment Method	Cover Type Objective	Age Structure	Approval Status
13	72212013-Cut	8.2	4130 - Aspen	Poletimber Medium	77	Unspec ified	Harvest	Clearcut	413 - Aspen	Even-Aged	Draft Field Boundary

Habitat Cut: No

Site Condition:

Prescription Final harvest with no retention due to small stand size. Protect wildlife shrubs, add drumming log spec.

Specs:

Next Step Monitoring, Natural Regen (Re-Inventory)

Treatments:

Acceptable Aspen

Regen:

Other

Comment:

Proposed Start Date: 10/01/2018

22	72212022-Cut	50.7	4116 - Mixed N. Hardwood - Aspen	Poletimber Well	78	81-110	Harvest	Clearcut with Retention	4116 - Mixed N. Hardwood - Aspen	Even-Aged	Draft Field Boundary
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Habitat Cut: No

Site Condition:

Prescription Final harvest leaving standard island retention. Focus retention around longer lived species (maple). Protect adjacent gas wells and pipelines.

Specs:

Next Step Monitoring, Natural Regen (Re-Inventory)

Treatments:

Acceptable Mix of northern hardwoods and aspen.

Regen:

Other

Comment:

Proposed Start Date: 10/01/2018

26	72212026-Cut	13.6	42110 - Planted Red Pine	Sawtimber Well	62	171-200	Harvest	Crown Thinning	42110 - Planted Red Pine	Even-Aged	Draft Field Boundary
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Habitat Cut: No

Site Condition:

Prescription Thin stand down to 120BA, follow standard BMP's along Kolka Creek.

Specs:

Next Step

Treatments:

Acceptable

Regen:

Other Talked with Fisheries, no concerns due to this being a thinning.

Comment:

Proposed Start Date: 10/01/2018

27	72212027-cut-oi	5.7	4133 - Aspen, Mixed Pine	Poletimber Medium	62	Unspec ified	Harvest	Clearcut	4138 - Aspen (OI)		Field Boundary
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Habitat Cut: No

Site Condition:

Prescription OPIC - FMD: Open poor quality aspen and white pine with cherry brush and Q-types scattered in the understory. The stand is an aspen ridge on high ground. This stand will provide access to stand 28 and the other red pine in compartment 211 between the st

Specs:

Next Step

Treatments:

Acceptable

Regen:

Other

Comment:

Proposed Start Date: 10/01/2008



Stand	Treatment Name	Acres	Stand CoverType	Size Density	Stand Age	BA Range	Treatment Type	Treatment Method	Cover Type Objective	Age Structure	Approval Status
46	72212028-Cut	3.2	6128 - Lowland Coniferous, Mixed Deciduous	Poletimber Medium	86	1-50	Harvest	Low Thinning	4211 - Planted Red Pine	Even-Aged	Field Boundary

Habitat Cut: No

Site Condition: BMPs

Prescription Recommend a third row thin - plus the marking of suppressed individuals and poor formed trees in adjacent rows. There are a couple pockets with hardwood or failed portions that do not have as high of BA. Mark trees along stand boundary to drop into the Q-type (bigger branchy conifer preferred). Also, retain some down woody debris within the stand. The intention of this treatment is to improve the quality of the red pine and to provide new wildlife opportunities through the creation of down woody debris.

Next Step
Treatments:

Acceptable
Regen:

Other This treatment was rebuilt due to being lost in the MiFI migration.
Comment:

Proposed Start Date: 10/01/2008

31	72212031-cut-oi	109.8	42110 - Planted Red Pine	Sawtimber Well	62	171-200	Harvest	Crown Thinning	4211 - Planted Red Pine	Even-Aged	Field Boundary
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Habitat Cut: No

Site Condition: Too Wet

Prescription Thin stand to 120 residual BA.

Specs:

Next Step
Treatments:

Acceptable
Regen:

Other
Comment:

Proposed Start Date: 10/01/2008

36	72212036-Cut	28.2	4139 - Aspen, Mixed Deciduous	Poletimber Medium	71	Unspecified	Harvest	Clearcut with Retention	413 - Aspen	Even-Aged	Draft Field Boundary
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Habitat Cut: No

Site Condition: Unknown Access

Prescription Final harvest leaving minimum retention to maximize aspen sprouting.

Specs:

Next Step Monitoring, Natural Regen (Re-Inventory)
Treatments:

Acceptable Aspen, mixed hardwoods.
Regen:

Other Not sure if we can get access to this stand. Kolka Creek is buffered 200ft per fisheries division.
Comment:

Proposed Start Date: 10/01/2018

44	72212044-Cut	55.1	4136 - Aspen, Mixed Conifer	Poletimber Well	53	Unspecified	Harvest	Clearcut with Retention	413 - Aspen	Even-Aged	Draft Field Boundary
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Habitat Cut: No

Site Condition:

Prescription Final harvest with standard island retention, add drumming log specs. Use old haul road that connects gas well (stand 419) to Mount Frederic
Specs: Road for haul route during harvest.

Next Step Monitoring, Natural Regen (Re-Inventory)
Treatments:

Acceptable Aspen
Regen:

Other Discussed with Neal from Fisheries, he approves treatment area distance from Bradford Creek.
Comment:

Proposed Start Date: 10/01/2018



S t a n d	Treatment Name	Acres	Stand CoverType	Size Density	Stand Age	BA Range	Treatment Type	Treatment Method	Cover Type Objective	Age Structure	Approval Status
47	72212047-Cut	48.2	42110 - Planted Red Pine	Sawtimber Medium	63	1-50	Harvest	Clearcut	4211 - Planted Red Pine	Even-Aged	Draft Field Boundary

Habitat Cut: No

Site Condition:

Prescription Final harvest with no retention, trench and plant to red pine. Allow roller chopping and herbicide if needed.

Specs:

Next Step SitePrep, Trenching; SitePrep, Roller Chopping; Planting, Initial Plant; Monitoring, Artificial Regen(1yr); Monitoring, Artificial Regen(3yr);

Treatments: Pesticide, Skidder/Mechanical

Acceptable Red Pine

Regen:

Other Harvest as much of the regeneration as possible to help with site prep.

Comment:

Proposed Start Date: 10/01/2018

53	72212053-Cut	10.8	42110 - Planted Red Pine	Sawtimber Well	63	141- 170	Harvest	Clearcut	4211 - Planted Red Pine	Even-Aged	Draft Field Boundary
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Habitat Cut: No

Site Condition:

Prescription Final harvest with no retention, trench and plant to red pine. Allow roller chopping and herbicide use if necessary. Harvest and plant with adjacent

Specs: stand 47.

Next Step SitePrep, Roller Chopping; SitePrep, Trenching; Pesticide, Skidder/Mechanical; Planting, Initial Plant; Monitoring, Artificial Regen(1yr);

Treatments: Monitoring, Artificial Regen(3yr)

Acceptable Red Pine

Regen:

Other

Comment:

Proposed Start Date: 10/01/2018

417	72212417-NF	25.1	310 - Herbaceous Openland	Nonstocked		Unspec ified	NonForestMgt	Mowing	310 - Herbaceous Openland		Draft Field Boundary
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Habitat Cut: No

Site Condition:

Prescription Periodic opening maintenance, as needed, that may include disking, fertilizing, food plot seeding, no-till prairie grass drill seeding, shrub planting,

Specs: mowing, brushing, burning and herbicide application.

Next Step

Treatments:

Acceptable

Regen:

Other

Comment:

Proposed Start Date: 05/01/2017

**Total Treatment
Acreage Proposed: 514.2**

Report 4 – Site Conditions

Grayling Mgt. Unit

Matthew Foster : Examiner

Compartment: 212

Year of Entry: 2019

Availability for Management

Total Acres	Acres Available	Acres Avail		Acres Not Available		Dominant Site Conditions				
		With Condition				2B	5F	2G	3J	5E
395	357	29		9	Aspen	29			8	1
18	18	0		0	Bare/Sparsely Vegetated					
13	13	0		0	Bog					
110	110	0		0	Herbaceous Openland					
98	98	0		0	Low-Density Trees					
88	2	0		86	Lowland Conifers				86	0
123	123	0		0	Lowland Shrub					
22	4	0		18	Lowland Spruce/Fir			18		
678	678	0		0	Northern Hardwood					
191	191	0		0	Red Pine					0
3	3	0		0	Sand, Soil					
1	1	0		0	Treed Bog					
31	13	19		0	Upland Spruce/Fir		19			
22	22	0		0	Urban					
0	0	0		0	Water					
1,793	1,631	48		114	Total Forested Acres	29	19	18	95	1
	91%	3%		6%	Relative Percent					

**Due to limitations in the current Site Conditions Analysis tool, all nonforested acres are considered available. Future development will enable analysis of nonforested types.*

Site No.	Dominant Site Cond Availability	Dominant Site Condition	Acres	Other Site Condition	Other Site Condition	Other Site Condition	Other Site Condition
1	Available	2B: Unknown if access through adjacent landowner(s) is possible	29	Unspecified	Unspecified	Unspecified	Unspecified
Comments:							
2	Available	5F: Evaluated for Forest Health Considerations	19	Unspecified	Unspecified	Unspecified	Unspecified
Comments:							
Evaluated by Pat Potter for spruce bud worm damage in December of 2015. Stands will be up for inventory in 2019 cycle and stand can hold till then for prescribing then. Currently no occurrence of spruce bud worm in this white spruce stand.							

Report 4 – Site Conditions

Grayling Mgt. Unit
Matthew Foster : Examiner

Compartment: 212
Year of Entry: 2019

3	Unavailable	5E: Long-Term Retention	1	Unspecified	Unspecified	Unspecified	Unspecified
Comments:							
4	Unavailable	3J: Water quality / BMPs (stream, river, or lake)	5	Unspecified	Unspecified	Unspecified	Unspecified
Comments:							
6	Unavailable	3J: Water quality / BMPs (stream, river, or lake)	44	Unspecified	Unspecified	Unspecified	Unspecified
Comments:							
7	Unavailable	3J: Water quality / BMPs (stream, river, or lake)	38	Unspecified	Unspecified	Unspecified	Unspecified
Comments:							
8	Unavailable	2G: Too wet (sensitive soils, does not include access issues)	19	Unspecified	Unspecified	Unspecified	Unspecified
Comments:							
9	Unavailable	5E: Long-Term Retention	0	Unspecified	Unspecified	Unspecified	Unspecified
Comments:							
10	Unavailable	3J: Water quality / BMPs (stream, river, or lake)	8	Unspecified	Unspecified	Unspecified	Unspecified
Comments: 300 ft buffer along Kolka Creek.							

Mgt. Unit

Compartment: #Type!

Year of Entry:



Report 5 – PROPOSED SPECIAL CONSERVATION AREA* (SCA) DETAILS

* This is a partial list of SCAs for this compartment. Not included are those areas identified under other Department initiatives (Natural Rivers, Deer Wintering Areas, etc.). Those will be identified in separate, future map and report products.

SCA Name	SCA Category	Detail Type	Recommendation	Acres
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Comments



Report 6 – EXISTING SPECIAL CONSERVATION AREA DETAILS

* This is a list of SCA's for this compartment along with a 1/4 mile buffer surrounding the compartment. Refer to the Special Conservation Area Map for locations of the below listed Conservation Areas.

ERA = Ecological Reference Area
 HCVA = High Conservation Value Area
 SCA = Special Conservation Area

Conservation Area	Type	Description
SCA	Cold Water Stream	A coldwater stream has temperature and dissolved oxygen conditions that allow naturally-reproduced or stocked trout populations and those of other coldwater fish species (e.g., slimy sculpin) to persist from year to year. Coldwater streams in Michigan typically provide these conditions due to substantial contributions of groundwater to their stream flows. Such streams are established by Director's action and designated as trout resources by Fisheries Order 210.
SCA	Riparian Area	A transitional area between aquatic and terrestrial ecosystems in which the terrestrial ecosystem influences the aquatic ecosystem and vice-versa. Because of the unique conditions adjacent to lakes, streams and open water wetlands, riparian areas harbor a high diversity of plants and wildlife. Riparian communities are ecologically and socially significant in their effects on water quality and quantity, as well as aesthetics, habitat, bank stability, timber production, and their contribution to overall biodiversity.
HCVA	Natural Rivers	There are two Natural Rivers datasets which are derived from spatial buffers set from an established and approved distance from the river centerlines. The Natural Rivers Zoning District is a 400 foot buffer for most Natural Rivers. The Vegetative Buffer ranges from 25 to 100 feet. To view specific Zoning Districts and Vegetative Buffers for each Natural River see the table located on the I:\Documentation\GDSE data folder.



	Level 4 Cover Type	Size Density	Acres	Stand Age	BA Range	General Comments:
1	4110 - Sugar Maple Association	Poletimber Well	120.7	83	81-110	Quality and BA is higher closer to Deward Road, once you are into the stand BA is lower and majority of stems are in clumps. Average BA is around 95. A few scattered aspen pockets as seen on the IR photos, majority of the understory is ironwood and beech. Topography is rolling with many hills and valleys.
2	4139 - Aspen, Mixed Deciduous	Sapling Well	60.5	19	Immature	Harvested in 1999, mixed stand of aspen and hardwoods, few open areas on east end.
4	4139 - Aspen, Mixed Deciduous	Sapling Well	8.2	27	Immature	Mixed stand of hardwoods and aspen, also found a couple of elm.
5	4111 - S.Maple, Hard Mast Association	Poletimber Well	94.0	86	111-140	Thinned down to 75 BA in 2002. A few regeneration gaps with nice sugar maple regeneration, but majority of the understory is beech and ironwood. Overstory beech distribution is patchy, some areas have very little beech and others the beech is the majority. Stand is hilly with ridges.
6	4110 - Sugar Maple Association	Sawtimber Well	18.4	91	111-140	Nice hardwood stand, thinned last in the early 1990's. Average BA = 113.
8	4139 - Aspen, Mixed Deciduous	Sapling Well	11.4	14	Immature	Harvested in 2004, stand is an A3 in areas, pockets of upland brush and mixed hardwood. There are apple trees and hawthorn found along the snowmobile trail. South end has a couple open areas.
9	42310 - Planted Spruce	Poletimber Well	12.2	53	Unspecified	Narrow stand of planted spruce, borders old gravel pit (stand 11). No budworm issues.
10	42310 - Planted Spruce	Poletimber Well	19.2	53	141-170	Planted white spruce, same as stand 9. No budworm issues.
12	4130 - Aspen	Poletimber Medium	39.0	66	Unspecified	Balsam fir near the creek, more of a mix with hardwoods at the north end of the stand. It will be hard to manage for aspen with the stand being long and narrow, while bordering a natural river. Some aspen has died and fallen over, regenerating nicely in these areas.
13	4130 - Aspen	Poletimber Medium	8.2	77	Unspecified	Poor quality aspen with open areas, small drainage on the east point that leads down to Kolka Creek.
15	4119 - Mixed Northern Hardwoods	Poletimber Well	182.9	78	81-110	Looks like past management, most trees are in multi-stemmed clumps, very hilly. Old notes indicate this property was obtained from Shell Western. Average BA is 90-95.
16	4130 - Aspen	Sapling Well	33.3	19	Immature	Harvested in 1999, mix of aspen pockets and hardwoods with a couple of open areas.
17	4139 - Aspen, Mixed Deciduous	Sapling Well	52.1	27	Immature	Harvested in 1991, mix of aspen pockets and maple, some beech coming in underneath. Aspen is getting close to being pole sized while maple is still sapling size.



Stand	Level 4 Cover Type	Size Density	Acres	Stand Age	BA Range	General Comments:
18	4110 - Sugar Maple Association	Poletimber Well	53.5	78	51-80	Variable stand, mostly pole sized maple mixed with log sized basswood. Lots of multiple stemmed stump sprouts. Couple aspen pockets near the two track and road.
19	4110 - Sugar Maple Association	Poletimber Medium	8.7	77	51-80	Mostly sugar maple with a pocket of aspen included. Stand is on a steep downslope to the pvt property and Mt Frederic Rd. A couple of illegal ORV trails climbing the hill.
20	4119 - Mixed Northern Hardwoods	Poletimber Medium	16.3	77	51-80	Clumps of sugar maple with scattered aspen clones, red maple and basswood. Looks like a lot of overgrown roads where ORV's used to climb the hill.
21	4119 - Mixed Northern Hardwoods	Poletimber Well	121.5	83	81-110	This stand is very hilly, east half of stand slopes down to the private property. Some areas look two aged with pole sized maple and log sized basswood. A lot of illegal ORV activity especially at the southern end. Hardwood quality is not the best, a lot of multi stemmed stump sprouts. Scattered small pockets of aspen. Old notes indicate this used to be Shell Western land.
22	4116 - Mixed N. Hardwood - Aspen	Poletimber Well	50.7	78	81-110	New stand added, this is more of a hardwood/aspen mix. South end has more quaking and red maple, north end is more sugar maple and bigtooth. Hardwood is poor quality, multi stemmed and open grown in areas. It would be best to manage for a hardwood/aspen mix here similar to other harvests in the compartment.
26	42110 - Planted Red Pine	Sawtimber Well	13.8	62	171-200	Third row thinned in 1995 with adjacent stand to the south. Nice stand, a couple pockets of aspen and mixed hardwood. This stand should be thinned.
27	4133 - Aspen, Mixed Pine	Poletimber Medium	6.9	62	Unspecified	<p>This stand is currently under contract (72-010-16 Kolka Creek Red Pine), this being final harvested. Mostly aspen in north half and pine with some aspen in south half, aspen is poor quality. This is a small ridge of high ground with creeks and low ground on both sides. This stand will provide access to stands 28, 37, 31, and 28 to the south when this sale is harvested.</p> <p>Old Prescription: Harvest all trees 2" and greater. The stand should regenerate to a moderately stocked aspen stand with mixed conifer component. If adequate regeneration is not obtained - this stand will be planted to red pine around any pockets of natural regeneration. Factor limited stand due to you need a portable bridge to access across Kolka Creek and we do not have equipment to set portable bridge.</p>
28	42110 - Planted Red Pine	Poletimber Well	3.2	62	201+	This stand is currently under contract (72-010-16 Kolka Creek Red Pine), has never been thinned. They will be taking out rows and individual suppressed trees leaving a residual BA of 130 ft ² /acre.
30	6122 - Black Spruce	Poletimber Medium	3.7	86	1-50	Very wet, open areas full of tag alder.
31	42110 - Planted Red Pine	Sawtimber Well	114.8	62	171-200	Thinned in 1991, currently under contract (72-010-16 Kolka Creek Red Pine), thinning the stand down to 120 ft ² /acre. Dense understory in most areas, average diameter is larger in the north half of the stand.



	Level 4 Cover Type	Size Density	Acres	Stand Age	BA Range	General Comments:
33	6129 - Mixed Coniferous Lowland Forest	Poletimber Poor	1.9	58	Unspecified	Small, sparse, and wet stand of tamarack, spruce, and fir.
34	6122 - Black Spruce	Poletimber Medium	18.5	86	Unspecified	Very wet, open areas with tag alder. Pocket of red maple on the downslope from stand 31 is included. .
36	4139 - Aspen, Mixed Deciduous	Poletimber Medium	28.9	71	Unspecified	Mix of aspen and hardwoods, a small wet area at the north end of the stand. This stand was prescribed last YOE but never harvested due to no legal access. Aspen is declining, this stand should be regenerated if we can find access.
38	6128 - Lowland Coniferous, Mixed Deciduous	Poletimber Medium	43.5	91	51-80	Variable stand, cedar is mostly concentrated near Bradford Creek. A few pockets look like they have blown down in the past and regenerated naturally. There are multiple drainages throughout this stand that flow into Bradford Creek.
44	4136 - Aspen, Mixed Conifer	Poletimber Well	86.8	53	Unspecified	Mixed aspen stand, good amount of balsam fir both in the overstory and understory. A few open areas scattered throughout.
45	4133 - Aspen, Mixed Pine	Poletimber Well	13.9	40	Unspecified	Poor quality aspen mixed with white pine. Found a some scotch pine near the road.
46	6128 - Lowland Coniferous, Mixed Deciduous	Poletimber Medium	38.1	86	1-50	Mixed stand adjacent to Bradford Creek, wet sparse areas with just tag alder.
47	42110 - Planted Red Pine	Sawtimber Medium	48.2	63	1-50	Third row thinned in 2000, 40 BA left in 2010. Mixed stand in the understory, mostly aspen, cherry, and red pine. Aspen regeneration is around 10 ft tall and the red pine regeneration is around 5 ft tall, aspen is more dominate overall and red pine regeneration is patchy. A large strip of retention (now stand 53) was left along the road during the last harvest.
48	4130 - Aspen	Poletimber Well	45.8	47	Unspecified	Poor quality aspen, looks like areas were left uncut during the past harvest, possibly a buffer for private? A few open areas, aspen diameter is variable.
49	4110 - Sugar Maple Association	Poletimber Well	10.9	83	51-80	A good amount of multi stemmed maple and basswood, a few aspen mixed in.
51	6129 - Mixed Coniferous Lowland Forest	Poletimber Medium	4.6	88	1-50	Did not visit stand, looks like a mix of spruce, fir, and white pine along the edge of Kolka Creek.
53	42110 - Planted Red Pine	Sawtimber Well	10.8	63	141-170	New stand separated from stand 47, this is retention left from when stand 47 was harvested. Dense strip of jack pine regeneration along Old 27.



Stand	Cover Type	Acres	Managed Site	General Comments:
3	330 - Low-Density Trees	7.6	No	This stand has two pockets of aspen with scattered cherry between them. Hardwoods are coming up under the aspen. Heavy blackberry in areas, looks like an old railroad grade may have run through the stand.
7	110 - Low Intensity Urban	3.8	No	Active gas and oil facility, fenced and gated off.
11	790 - Other Bare/Sparsely Vegetate	17.6	No	Most current activity looks to be illegal ORV use and target practices. Old Notes: PIT WAS ACTIVE IN 1996.
14	330 - Low-Density Trees	4.2	No	Open area with scattered maple and cherry.
24	330 - Low-Density Trees	22.7	No	Scattered cherry with poor quality pockets of aspen and hardwood. Scattered conifers are starting to pop up. Hawthorne and blackberry present in the understory, spruce and fir along the stream.
25	6224 - Treed Bog	1.5	No	Small bog with spruce, fir, and tamarack, very wet.
29	622 - Lowland Shrub	80.6	No	Grassy w/ alder and a few scattered conifers, Kolka Creek runs through the middle of this stand.
32	622 - Lowland Shrub	32.3	No	Bradford Creek and adjacent lowland, grassy with alder and a few scattered conifers.
35	6225 - Bog	13.4	No	Bog filling in with pine, tamarack, spruce, and fir.
37	330 - Low-Density Trees	5.3	No	Open area with scattered cherry and old white pine stumps, one small aspen pocket included.
39	622 - Lowland Shrub	9.6	No	Lowland shrubs and grasses along the edge of Kolka Creek.
40	330 - Low-Density Trees	6.1	No	Open stand with scattered cherry, maple, and white pine.
41	3303 - Mixed Low Density Trees	22.3	No	Rolling topography with scattered cherry, red maple, aspen, and white pine with some balsam fir near Kolka Creek.
42	110 - Low Intensity Urban	2.3	No	A portion of this area is enclosed by a fence for the CPF. There is hazardous gas processed here. The rest is a hill that was cut away and most likely used for fill and/or gravel. This part is covered w/ bracken fern.
43	330 - Low-Density Trees	11.5	No	Open area with scattered white pine, cherry, and aspen. Looks like possibly an old gas well pad was in the south half.



Stand	Cover Type	Acres	Managed Site	General Comments:
50	500 - Water	0.3	No	A wet area with open water inside stand 34.
52	122 - Road/Parking Lot	15.8	No	Old 27 and the cleared ROW.
400	310 - Herbaceous Openland	0.9	No	Well site, Linn Operating State Frederic V D1-2.
401	310 - Herbaceous Openland	3.2	No	Well site and a grassy opening, Linn Operating Frederic V B4-10.
403	310 - Herbaceous Openland	7.3	No	Open area where vehicles have climbed the hill. This is part of Mt Frederic- erosion issues present. Multiple guardrails in place trying to stop the illegal ORV use.
404	310 - Herbaceous Openland	54.7	No	Grassy field between two hills, a couple of small aspen pockets in the middle.
405	710 - Sand, Soil	3.4	No	Abandoned old well site, a lot of ORV activity climbing adjacent hills.
406	310 - Herbaceous Openland	1.3	No	Well site, Linn Operating Frederic IV C1-10.
407	310 - Herbaceous Openland	1.3	No	Merit Energy Company Kerr 2-10A well.
408	310 - Herbaceous Openland	2.1	No	No well on site, a pipeline runs to the center with an electric outlet.
409	310 - Herbaceous Openland	2.9	No	Well site and adjacent open area, Linn Operating Fredric IV D1-10.
410	310 - Herbaceous Openland	1.2	No	Well site, Linn Operating Frederic V D3-10.
411	330 - Low-Density Trees	4.9	No	Opening with cherry and aspen clumps and some blackberry patches.
412	31029 - Grass (OI)	0.7	No	Well Site, Linn Operating State Fredric VI B1-15.
413	310 - Herbaceous Openland	1.6	No	Well site, Linn Operating Frederic VI B4-15.
414	310 - Herbaceous Openland	1.3	No	Well site, Linn Operating Frederic VI D4-15.
415	31029 - Grass (OI)	0.8	No	Well site, Linn Operating Frederic VI D1-15.
416	310 - Herbaceous Openland	1.6	No	Grassy opening, filling in with red pine from adjacent stand 31.



Stand	Cover Type	Acres	Managed Site	General Comments:
417	310 - Herbaceous Openland	25.1	Yes	Some scattered cherry and red maple, one small pocket of jack pine/aspens. Wildlife is currently doing opening maintenance while the temporary bridge is in.
418	330 - Low-Density Trees	7.1	No	Scattered cherry, balsam fir, and aspen. A few large, old white pine stumps scattered throughout.
419	310 - Herbaceous Openland	0.8	No	Well Site, Linn Operating Frederic V A4-14.
422	310 - Herbaceous Openland	1.3	No	Well Site, Linn Operating Frederic VI B3-15.
423	310 - Herbaceous Openland	1.6	No	Well site, Linn Operating Frederic V C3-10.
424	330 - Low-Density Trees	4.8	No	Aspen and hardwoods along the edges are closing in. Mostly scattered cherry with a couple of apple trees found.
425	330 - Low-Density Trees	1.5	No	Scattered cherry with various saplings starting to fill in.