



Report 1 – Compartment Review Presentation

Traverse City Forest Management Unit

Compartment 222

Entry Year 2015

Acreage: 1,902

County Kalkaska

Management Area: Grayling Outwash

Revision Date: 04/18/2013

Stand Examiner: Katie
Armstrong

Legal Description:

T26N R5W, Sections 9, 16, 21, 28 and 29

Identified Planning Goals:

This compartment is part of the Grayling Outwash Management Area (MA). Management goals for this MA include balancing the age classes of aspen on suitable sites, thinning northern hardwoods, balancing age classes of red pine and jack pine, and regenerating the aging swamp hardwood and conifer resource. Dominant cover types in this compartment include nearly 500 acres of opening, which Wildlife Division attempts to maintain with prescribed burning, and 400 acres of planted red pine. There are also sizeable stands of oak and wetland conifers. Management challenges include maintaining wildlife openings given the logistical and funding challenges that make prescribed burning increasingly hard to accomplish and regenerating certain species, especially in wet areas, in the context of elevated deer browse levels. While not true old growth, a couple natural pine stands are starting to exhibit complex vertical structure, species diversity and good habitat value. These values will be promoted within these stands.

Soil and topography:

Most of the compartment lies on sandy soils including Rubicon, Croswell, and Au Gres sands. The areas near the Manistee River and Black Creek are dominated by wetlands with poorly drained muck soils including Au Sable-Bowstring and Tawas-Leafriver mucks. Most of the compartment is flat with the exception of a relatively steep ridge north of Riverview Road. This ridge, which gains 200 feet of elevation, generally faces southeast and south with multiple smaller valleys.

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

Several private parcels are located along the Manistee River. These are mostly cabins with seasonal use. The private parcel along the Manistee River, which divides this compartment into two parts, is protected by the Grand Traverse Regional Land Conservancy with a conservation easement. Three parcels that were owned by Consumers Energy and formerly had private leases have been added to the compartment since the last inventory. Section 9 and most of Section 16 is leased to the Department of Military and Veterans Affairs as part of the Camp Grayling training area. The Black Creek Conservation association owns nearly 1,500 acres west of this compartment, which it manages primarily for white-tailed deer habitat.

Unique, Natural Features:

There is at least one record of a state-Special Concern animal species in the compartment. A few jack pine stands, although relatively small, are within the age range that might support Kirtland's warblers.

Archeological, Historical, and Cultural Features:

There is at least one known archeological site in Section 16 and potential for additional sites is higher because of the river corridor.

Special Management Designations or Considerations:

One stand of natural red and white pine is proposed for designation as a Special Conservation Area (SCA) due to its age and diversity. This area extends into Compartment 122 to the west.

Watershed and Fisheries Considerations:

The Manistee River and its tributaries are protected by the Natural Rivers Act, which prohibits most timber management within 175 feet of the river and 50 feet of tributaries. The Manistee River is a Designated Trout Stream. The Upper Manistee River supports self-sustaining populations of brook and brown trout and is a world-famous trout fishery. Black Creek is also a Designated Trout Stream.

Wildlife Habitat Considerations:

Feature Wildlife Species for this MA include: pileated woodpecker, ruffed grouse, snowshoe hare, wild turkey, and white-tailed deer. [Additional text to be added by WLD.]

The Black Creek Deeryard extends into this compartment from the west. It is one of the most heavily used deeryards in the region and heavy deer concentrations affect timber management in the entire compartment due to heavy browse. There is a deer enclosure within a jack pine stand in Section 21. The large open area in the north part of the compartment, along with areas to the west, has been maintained through prescribed burning in recent history. Some of this area is filling in with woody vegetation, however, since burning has not occurred as often as necessary.

Mineral Resource and Development Concerns and/or Restrictions

Surface sediments consist of ice-contact and glacial outwash sand and gravel and postglacial alluvium. The glacial drift thickness varies between 200 and 400 feet. Beneath the glacial drift are the Mississippian Marshall Sandstone and Coldwater Shale. The Marshall was used as a building stone in the past. The nearest gravel pit is just to the north and potential is considered good on the uplands. This area is located two miles north of Garfield Field. The field produces from the Devonian Richfield and the Ordovician PdC. The PdC has produced over 46 bcf gas. The compartment is leased for oil and gas development for the Collingwood Formation.

Vehicle Access:

Existing roads are adequate and no closures are necessary at this time.

Survey Needs:

Additional survey will be needed in Section 16, NESE around the parcel that is an expired Consumers Energy lease.

Recreational Facilities and Opportunities:

The Kalkaska ORV trail, which has a 50-inch maximum vehicle width, crosses the northern portion of the compartment in an east/west fashion. The Kalkaska ORV route, which is designed for vehicles wider than 50", bisects the compartment and then runs north along the western side of the compartment. Proposed timber management activities should include trail protection specifications to reduce impacts, as well as serve as an example of how silviculturally sound timber harvesting practices can co-exist and often improve recreation and hunting experiences for future generations. Treatments proposed directly adjacent to the ORV trail tread should include either a "flush cut" specification, or be stumped high enough (3 feet) to avoid being hidden by perennial flora (ferns). Yellow Trees Landing which provides canoe and kayak access to the Manistee River and a small parking area is in this compartment. (Submitted by Todd Neiss)

Fire Protection:

Between the wet stands along the Manistee River and the large open areas, wildfire risk in this compartment is relatively low. Due to the remoteness of this compartment, however, response time would be lengthy if a fire did start.

Additional Compartment Information:

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**

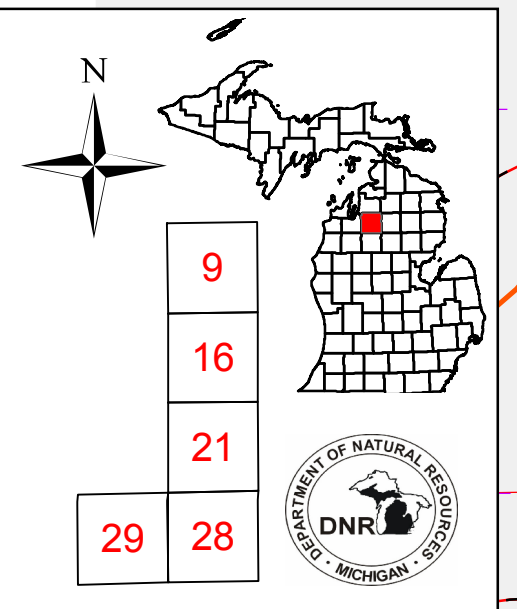
The following information is displayed, where pertinent, on the attached compartment maps:

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

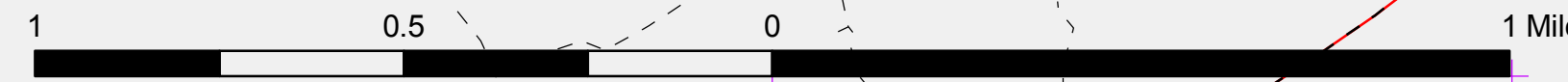
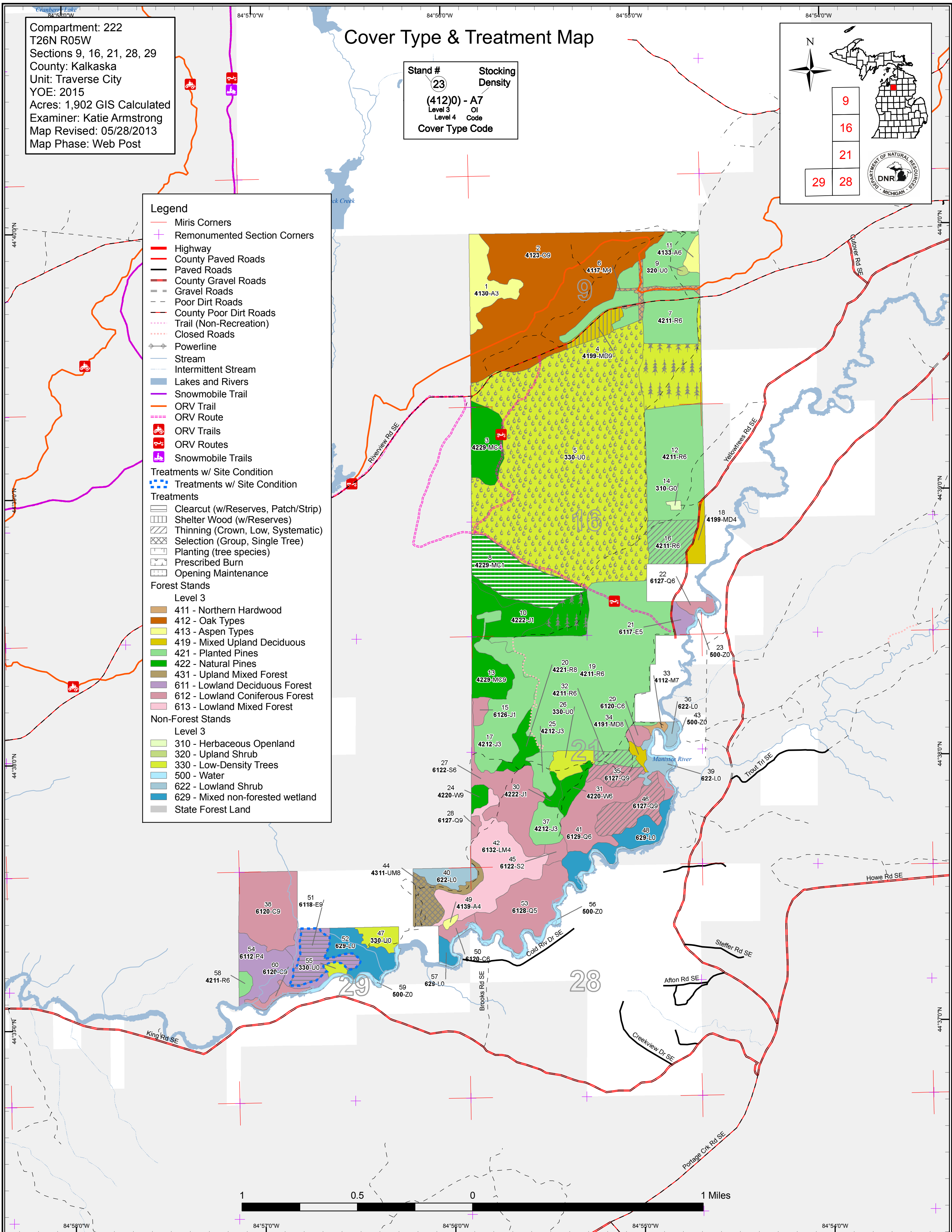
Cover Type & Treatment Map

Compartment: 222
 T26N R05W
 Sections 9, 16, 21, 28, 29
 County: Kalkaska
 Unit: Traverse City
 YOE: 2015
 Acres: 1,902 GIS Calculated
 Examiner: Katie Armstrong
 Map Revised: 05/28/2013
 Map Phase: Web Post

Stand # **23** Stocking Density
(412)0 - A7
 Level 3 OI
 Level 4 Code
 Cover Type Code



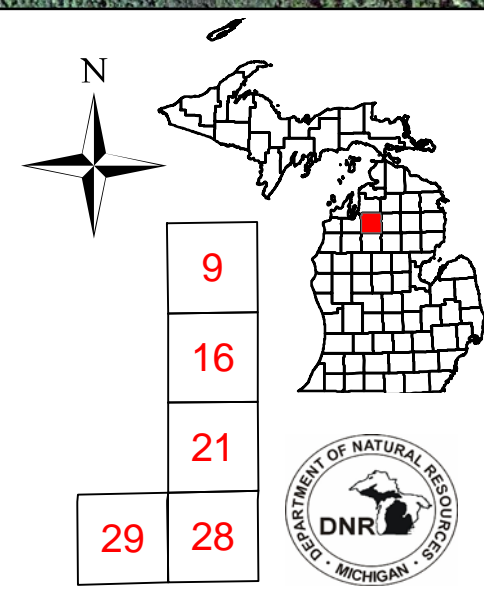
- Legend**
- Miris Corners
 - Remonumented Section Corners
 - Highway
 - County Paved Roads
 - Paved Roads
 - County Gravel Roads
 - Gravel Roads
 - Poor Dirt Roads
 - County Poor Dirt Roads
 - Trail (Non-Recreation)
 - Closed Roads
 - Powerline
 - Stream
 - Intermittent Stream
 - Lakes and Rivers
 - Snowmobile Trail
 - ORV Trail
 - ORV Route
 - ORV Trails
 - ORV Routes
 - Snowmobile Trails
 - Treatments w/ Site Condition
 - Treatments
 - Clearcut (w/Reserves, Patch/Strip)
 - Shelter Wood (w/Reserves)
 - Thinning (Crown, Low, Systematic)
 - Selection (Group, Single Tree)
 - Planting (tree species)
 - Prescribed Burn
 - Opening Maintenance
 - Forest Stands
 - Level 3
 - 411 - Northern Hardwood
 - 412 - Oak Types
 - 413 - Aspen Types
 - 419 - Mixed Upland Deciduous
 - 421 - Planted Pines
 - 422 - Natural Pines
 - 431 - Upland Mixed Forest
 - 611 - Lowland Deciduous Forest
 - 612 - Lowland Coniferous Forest
 - 613 - Lowland Mixed Forest
 - Non-Forest Stands
 - Level 3
 - 310 - Herbaceous Openland
 - 320 - Upland Shrub
 - 330 - Low-Density Trees
 - 500 - Water
 - 622 - Lowland Shrub
 - 629 - Mixed non-forested wetland
 - State Forest Land



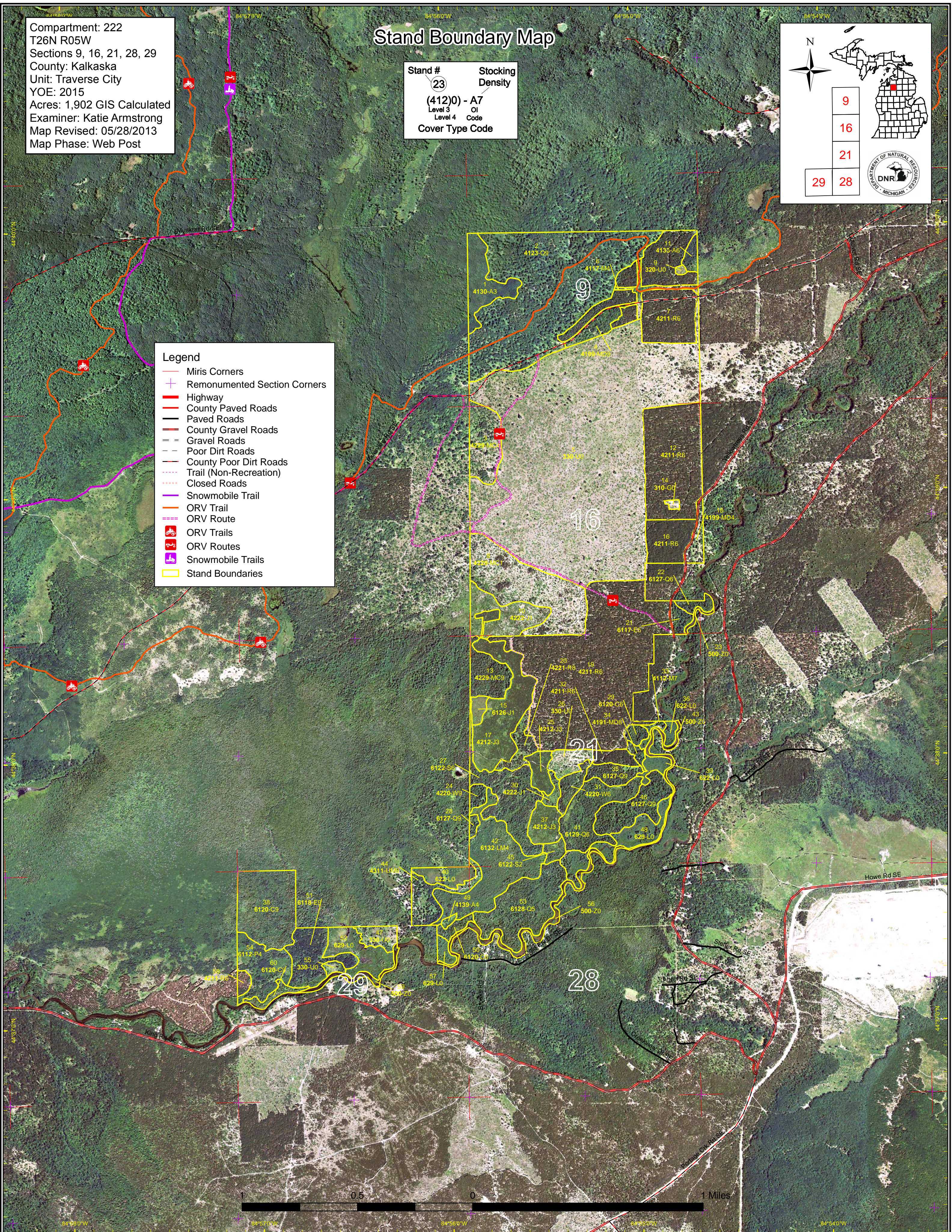
Stand Boundary Map

Compartment: 222
 T26N R05W
 Sections 9, 16, 21, 28, 29
 County: Kalkaska
 Unit: Traverse City
 YOE: 2015
 Acres: 1,902 GIS Calculated
 Examiner: Katie Armstrong
 Map Revised: 05/28/2013
 Map Phase: Web Post

Stand #
 23
Stocking Density
 (412)0 - A7
 Level 3 OI
 Level 4 Code
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- Legend**
- Miris Corners
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 - Highway
 - County Paved Roads
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 - Trail (Non-Recreation)
 - Closed Roads
 - Snowmobile Trail
 - ORV Trail
 - ORV Route
 - ORV Trails
 - ORV Routes
 - Snowmobile Trails
 - Stand Boundaries



Report 2 – Total Acres by Cover Type and Age Class



	Age Class													Total	
	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 +		Uneven Age
Aspen	0	0	26	0	5	0	1	0	0	0	0	0	0	0	33
Cedar	0	0	0	0	0	0	0	0	11	0	0	50	4	0	66
Herbaceous Openland	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Jack Pine	0	110	0	4	0	0	0	0	0	0	0	0	0	0	114
Low-Density Trees	495	0	0	0	0	0	0	0	0	0	0	0	0	0	495
Lowland Aspen/Balsam Poplar	0	0	29	0	0	0	0	0	0	0	0	0	0	0	29
Lowland Conifers	0	0	0	0	0	0	0	49	0	13	0	63	5	0	130
Lowland Deciduous	0	0	0	0	28	0	0	0	0	0	0	0	6	0	34
Lowland Mixed Forest	0	0	0	0	0	0	0	0	61	0	0	0	0	0	61
Lowland Shrub	75	0	0	0	0	0	0	0	0	0	0	0	0	0	75
Lowland Spruce/Fir	0	0	0	0	0	5	0	0	0	42	0	0	0	0	47
Mixed Upland Deciduous	0	0	0	0	0	9	3	0	0	0	11	0	0	0	23
Natural Mixed Pines	0	0	0	99	0	0	0	0	0	0	20	0	0	0	119
Northern Hardwood	0	0	0	0	0	7	0	0	2	0	0	0	0	0	9
Oak	0	0	0	0	0	0	0	0	0	192	0	0	0	0	192
Red Pine	0	0	0	0	0	413	0	0	0	0	0	0	0	0	413
Upland Mixed Forest	0	0	0	19	0	0	0	0	0	0	0	0	0	0	19
Upland Shrub	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Water	30	0	0	0	0	0	0	0	0	0	0	0	0	0	30
White Pine	0	0	0	0	9	0	0	0	5	0	0	0	0	0	14
Total	601	110	55	122	43	433	4	49	78	247	31	114	15	0	1902



Report 3 – Proposed Treatment Summaries

Traverse City Mgt. Unit
Year of Entry 2015

Compartment 222
Total Compartment Acres: 1902

Acres by Treatment Type

Commercial Harvest - 111 Tree Planting - 62 Other - 426
Habitat Cut - 7 Opening Maintenance - 48

Cover Type by Harvest Method

	Clearcut	Selection	Seed Tree	Shelterwood	Thinning	Other - Specify	Total Acres
(Habitat Cut)Northern Hardwood	0	7	0	0	0	0	7
Lowland Coniferous Forest	0	0	0	0	35	0	35
Lowland Deciduous Forest	22	0	0	0	0	0	22
Mixed Upland Deciduous	0	0	0	11	0	0	11
Planted Pines	0	0	0	0	30	0	30
Upland Mixed Forest	0	13	0	0	0	0	13
Total	22	20	0	11	65	0	119



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Treatment Name	Acres	CoverType	Size Density	Stand Age	BA Range	Treatment Type	Treatment Method	Cover Type Objective	Approval Status
4 61222004-SWCut	11.0	4199 - Other Mixed Upland Deciduous	High Density Log	103	81-110	Harvest	Shelterwood	4121 - Oak, Aspen	Cmpt. Review Proposal

Prescription Remove merchantable aspen and maple. Thin oak to total residual crown cover of about 50%.

Specs:

Other

Comments:

Next Steps: Regeneration check at time of next inventory. Acceptable regeneration includes oak, aspen, pine and maple.

Proposed

Start Date: 10/01/2014

6 61222006-Cut	7.5	4117 - Mixed N. Hardwood - Pine	Low Density Pole	51		Harvest	Group Selection	3303 - Mixed Low Density Trees	Cmpt. Review Proposal
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Prescription This area is intended to serve as a fire break between red pine stands. Remove all woody vegetation except red pine, white pine and oak.

Specs:

Other

This is not a commercial treatment but might be combined with Stand 4.

Comments:

Next

Steps:

Proposed

Start Date: 10/01/2014

16 61222016-RowThin	22.9	42110 - Planted Red Pine	High Density Pole	56	171-200	Harvest	Systematic Thinning	42110 - Planted Red Pine	Cmpt. Review Proposal
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Prescription Third row thin.

Specs:

Other

This stand was acquired since adjacent red pine stands were thinned. Line work may be necessary along south boundary.

Comments:

Next

Steps:

Proposed

Start Date: 10/01/2014

32 61222032-RowThin	7.3	42110 - Planted Red Pine	High Density Pole	51	171-200	Harvest	Systematic Thinning	42110 - Planted Red Pine	Cmpt. Review Proposal
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Prescription Third row thin.

Specs:

Other

This stand was acquired since adjacent red pine stand was thinned.

Comments:

Next

Steps:

Proposed

Start Date: 10/01/2014



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Treatment Name	Acres	CoverType	Size Density	Stand Age	BA Range	Treatment Type	Treatment Method	Cover Type Objective	Approval Status
35 61222035-Thin	11.1	6127 - Lowland Pine	High Density Log	98	111-140	Harvest	Low Thinning	6127 - Lowland Pine	Cmpt. Review Proposal

Prescription Thin red and white pine to approximately 120 sf. Remove all merchantable jack pine and spruce.

Specs:

Other Comments: Stand is wet so operability across whole stand is questionable and actual treatment area will likely be smaller. Cut during dry summer (preferred) or frozen winter

Next Steps:

Proposed Start Date: 10/01/2014

44 61222044-Cut	13.0	4311 - Pine, Aspen Mix	Medium Density Log	35		Harvest	Group Selection	4133 - Aspen, Mixed Pine	Cmpt. Review Proposal
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Prescription Remove merchantable aspen clones and jack pine.

Specs:

Other Comments:

Next Steps: Regen check at time of next inventory. Acceptable regeneration includes pine and aspen.

Proposed Start Date: 10/01/2014

46 61222046-Thin	24.2	6127 - Lowland Pine	High Density Log	113	81-110	Harvest	Low Thinning	6127 - Lowland Pine	Cmpt. Review Proposal
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Prescription Lightly thin white pine and red maple (mark to cut) to increase stand diversity in terms of vertical structure and size class. Opening canopy will encourage recruitment of white pine seedling into midstory. Most red pine is at the end of its life span so opening gaps may encourage regeneration to maintain a mixed stand. Cut all red pine except green-marked trees (~2 per acre).

Other Comments: Access will require constructing skid trail across low ground using crane mats. Treatment area has already excluded Manistee River buffer per Natural Rivers Plan.

Next Steps: Management of this stand should encourage growth of larger trees and within-stand structural and species diversity.

Proposed Start Date: 10/01/2014

8 61222008-PlantRP	16.7	42290 - Natural Mixed Pine	Low Density Sapling	30		Tree Planting	Machine Plant	42110 - Planted Red Pine	Cmpt. Review Proposal
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Prescription Prescribed burning has not been able to maintain this part of this opening so it is filling in with woody vegetation. Site prep and plant red pine per TMS specifications.

Other Comments:

Next Steps: Regen check.

Proposed Start Date: 10/01/2014

5 NF_61222005-PlantRP	45.0	3303 - Mixed Low Density Trees				Tree Planting	Machine Plant	42110 - Planted Red Pine	Cmpt. Review Proposal
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Prescription Prescribed burning has not been able to maintain this part of this opening so it is filling in with jack pine and other woody species. Site prep and plant red pine per TMS specifications.

Other Comments:

Next Steps: Regen check.

Proposed Start Date: 10/01/2014



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Treatment Name	Acres	CoverType	Size Density	Stand Age	BA Range	Treatment Type	Treatment Method	Cover Type Objective	Approval Status
5 NF_61222005-Burn	426.4	3303 - Mixed Low Density Trees				Prescribed Burn	Unspecified		Cmpt. Review Proposal

Prescription Prescribe burn
Specs:

Other
Comments:

Next
Steps:

Proposed
Start Date: Unspecified

8 61222008-NonFor	47.8	42290 - Natural Mixed Pine	Low Density Sapling	30		Non-Forest Management	Brush Cutting		Cmpt. Review Proposal
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Prescription Maintain opening.
Specs:

Other
Comments:

Next
Steps:

Proposed
Start Date: Unspecified

**Total Treatment
Acreage Proposed: 632.8**



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Treatment Name	Acres	CoverType	Size Density	Stand Age	BA Range	Treatment Type	Treatment Method	Cover Type Objective	Approval Status
51 61222051-Clearcut	21.9	6118 - Lowland Deciduous with Cedar	High Density Log	47		Harvest	Clearcut with Reserves	6112 - Lowland Aspen	Cmpt. Review Proposal

Prescription Specs: Clearcut merchantable aspen leaving all other species. Retention (175' buffer along Manistee River and 50' buffer along tributaries) has been removed from treatment area per Natural Rivers guidelines but distances should be verified in field before painting lines.

Other Comment: Access will be limited by ability to cross Black Creek or tributary.

Next Steps: Regeneration survey at time of next inventory. Acceptable regeneration includes aspen, cedar, ash, red maple and pine.

Proposed Start Date: 10/01/2014

Limiting Factor 2D: Portable Bridge Needed (Dept. bridge will be adequate)

Total Treatment Acreage Proposed: 21.9

Report 6 – Out of YOE – Treatments
 Prescribed with No Limiting Factor

Year of Entry: 2015



Treatment Name	Acres	CoverType	Size Density	Stand Age	BA Range	Treatment Type	Treatment Method	Cover Type Objective	Approval Status
28218	5.9	Unspecified				Harvest	Other - Specify in Comments	Unspecified	Cmpt. Review Proposal
<p><u>Prescription Specs:</u></p> <p><u>Other Comments:</u></p> <p><u>Next Steps:</u></p> <p><u>Proposed Start Date:</u></p>									
28219	7.2	Unspecified				Harvest	Other - Specify in Comments	Unspecified	Cmpt. Review Proposal - Incomplete
<p><u>Prescription Specs:</u></p> <p><u>Other Comments:</u></p> <p><u>Next Steps:</u></p> <p><u>Proposed Start Date:</u></p>									
61043_OutOfY OE-Cut	2.1					Harvest	Clearcut with Reserves	4131 - Aspen, Oak	Cmpt. Review Proposal - Incomplete
<p><u>Prescription Specs:</u> retain some pine and osk for mast and seed production, Folllow WLD guidance for CWD creation. Harvest all stems that are not retained.</p> <p><u>Other Comments:</u> New stand should have mix of oak, pine, aspen and maple.</p> <p><u>Next Steps:</u></p> <p><u>Proposed Start Date:</u> 09/01/2009</p>									
Total Treatment Acreage Proposed:		15.3							

Report 7 – Site Conditions

Traverse City Mgt. Unit
Katie Armstrong : Examiner

Compartment 222
Year of Entry 2015

Availability for Management

Total Acres	Acres		Dominant Site Conditions	Dominant Site Conditions						
	Available	Not Available		No	5C	5B	3J	3A	2G	2D
32	31	1	Aspen	31		0			1	
66	4	62	Cedar	4			16		46	
114	113	0	Jack Pine	113					0	
29		29	Lowland Aspen/Balsam Poplar				7		22	
130	37	93	Lowland Conifers	37			25		68	
34	26	9	Lowland Deciduous	4			8		0	22
61	0	61	Lowland Mixed Forest	0			0		60	
47	0	46	Lowland Spruce/Fir	0					46	
23	22	1	Mixed Upland Deciduous	22			1			
119	99	20	Natural Mixed Pines	99				20		
9	7	2	Northern Hardwood	7			2			
191	191		Oak	0		191				
412	412	0	Red Pine	400	12		0			
19	19		Upland Mixed Forest	19						
14	9	5	White Pine	9					5	
1,298	970	328	Total Forested Acres	745	12	191	59	20	249	22
	75%	25%	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	Dominant Site Condition	Acres	Other Site Condition	Other Site Condition	Other Site Condition	Other Site Condition
002	Available	2D: Portable Bridge Needed (Dept. bridge will be adequate)	22				
Comments: Treatment is desirable but access is uncertain. Portable bridge may be adequate but more recon is necessary.							
003	Not Available	2G: Too wet (sensitive soils, does not include access issues)	63	3H: Deer Wintering Areas			
Comments: Very wet. Part of Black Creek Deeryard.							

Report 7 – Site Conditions

Traverse City Mgt. Unit
Katie Armstrong : Examiner

Compartment 222
Year of Entry 2015

005	Not Available	3J: Water quality / BMPs (stream, river, or lake)	39	3C: Designated Quiet Area, Natural Area, or Wilderness	
Comments: Upper Manistee River is Designated Natural River. Within Native Vegetation Buffer for Manistee River (175 feet) or tributary (Black Creek, 50 feet).					
006	Not Available	3J: Water quality / BMPs (stream, river, or lake)	76	3C: Designated Quiet Area, Natural Area, or Wilderness	
Comments: Manistee River Natural River Corridor. Within Native Vegetation Buffer for Manistee River (175 feet).					
007	Not Available	3J: Water quality / BMPs (stream, river, or lake)	7	3C: Designated Quiet Area, Natural Area, or Wilderness	
Comments: Manistee River Natural River Corridor. Within Native Vegetation Buffer for Manistee River (175 feet).					
009	Not Available	3A: Potential old growth / biodiversity	20		
Comments: Older natural pine stand with good vertical structure. Allow natural processes to dominate.					
010	Available	5B: Retention for regeneration purposes	192		
Comments: Shelterwood harvest in oak type in 2007.					
012	Not Available	2G: Too wet (sensitive soils, does not include access issues)	196	5D: Unproductive Forest Land	
Comments: Wet stands and parts are also unproductive supporting only small trees.					

Report 7 – Site Conditions

Traverse City Mgt. Unit
Katie Armstrong : Examiner

Compartment 222
Year of Entry 2015

013	Available	5C: Delay treatment for age/size class diversity or exceptional site quality	12	
<p>Comments: Stand should be treated with adjacent red pine at next entry.</p>				
015	Not Available	2G: Too wet (sensitive soils, does not include access issues)	4	
<p>Comments:</p>				
016	Not Available	3J: Water quality / BMPs (stream, river, or lake)	1	3C: Designated Quiet Area, Natural Area, or Wilderness
<p>Comments: Upper Manistee River is Designated Natural River. Within Native Vegetation Buffer for Manistee River (175 feet) or tributary (Black Creek, 50 feet).</p>				



Report 8 – 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
Yellowtrees Access Site	Concentrated Recreation Area	Boat Access Site	SCA	0.6
Comments kayak ramp & small parking area				
Old red & white pine	Habitat Areas or Corridors	Other Habitat Area	SCA	19.5
Comments Older, natural red and white pine, developing complex vertical structure. High deer activity.				



Report 9 – DEDICATED CONSERVATION AREA DETAILS

* This is a list of Dedicated Biodiversity Areas for this compartment along with a 1/4 mile buffer surrounding the compartment. Refer to Dedicated Conservation Area Map for areas that the below listed Conservation Areas are located.

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

Conservation Area	Type	Description
SCA	Archaeological Site	An aquatic or terrestrial area of the State that contains physical remains of human occupation. These are sites of cultural and historical significance that may occur upon terrestrial areas and Great Lakes bottomlands. They include thousands of Native American settlements and burial sites, as well as French and British outposts, nineteenth century logging camps, mines and homesteads. Beneath the waters of the Great Lakes, there are shipwrecks and other remains documenting the maritime trade. Such sites may be identified by Natural heritage data from the State Historic Preservation Office. Proposed treatments in this compartment will be implemented in such a manner as to maintain the integrity of these sites. Due to the sensitive nature of this information, no further detail about location is available.
SCA	Cold Water Lake	A coldwater lake has temperature and dissolved oxygen conditions that allow naturally-reproduced or stocked trout populations and those of other coldwater fish species to persist from year to year. Suitable conditions for coldwater fishes may occur in Michigan lakes if they are relatively deep, have substantial groundwater inflows, or are located in colder (northern) areas of the state. Such lakes are established by Director's action and designated as trout resources by Fisheries Order 200.
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	Research and Military Areas	These areas provide facilities and lands specifically dedicated for research, or other purposes. They include the 5,847 acre Forest Fire Experiment Station, the 12,000 acre Houghton Lake Wildlife Research Area, the Beaver Islands Archipelago Wildlife Research Area (that includes most of Garden Island, all of High and Hog Islands, all state owned land on Beaver, South Fox and North Fox Islands), the Cusino Wildlife Research Area, the 3,000 acre Hunt Creek Fisheries Research Station, the 125 acre Wyman Nursery, and over 144,000 acres of Military Lands.
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.



Stand	Level 4 Cover Type	Size Density	Acres	Stand Age	BA Range	General Comments:
1	4130 - Aspen	High Density Sapling	26.4	20		Clearcut in summer 1993 as Red Line Aspen, 61-016-93-01. Continues into and accessed via Compartment 122, Stand 48. Military lease land.
2	4123 - Red Oak	High Density Log	191.7	91	51-80	Good quality oak. Thinned in 2007 as part of Riverview Oak sale, 61-044-05-01. Oak was thinned and all red maple, sugar maple, beech, white ash, black cherry and aspen trees were removed. ORV trail runs through stand and was buffered. Sale extended to the west into Compartment 122. Rolling hills, including steep hills, with 200+ elevation gain. Hills caused some operability issues during sale but crew was able to work around them. Fair to good regeneration but not a lot of oak. Some red maple seedlings and stump sprouts, some 2-3" DBH. Very heavy browse on red maple and other seedlings. Some pockets of dense aspen regeneration in canopy gaps. Some oak mortality. A couple pockets with dense conifer understory in northwest corner. Military lease land. Private property boundary along north edge is fenced and posted.
3	42290 - Natural Mixed Pine	Low Density Pole	27.2	30		Opening that is filling in. More and larger jack pine and white pine than surrounding U-type. Roller chopped in 1983. ORV route runs along eastern edge of stand. Military lease land.
4	4199 - Other Mixed Upland Deciduous	High Density Log	11.0	103	81-110	Variable stand, more aspen at eastern end and western end gradually transitions into U-type. Poor quality oak but significant oak regeneration in some places. Aspen is ready for treatment. Very heavy browse on red maple and other seedlings. OI treatment was delayed for age/size class diversity. Military lease land.
6	4117 - Mixed N. Hardwood - Pine	Low Density Pole	7.5	51		This stand is intended to serve as a firebreak around the planted red pine. It is heavily filling in with aspen, pine, and black cherry. The ORV trail runs through the north and east "arms" of the cross. Military lease land.
7	42110 - Planted Red Pine	High Density Pole	82.5	51	111-140	Planted in fall of 1962 with 3-0 red pine. Release treatment (non-commercial hardwood removal) in 1978. Third row thinned in summer 2007 as part of 222 Red Pine sale, 61-025-05-01. Decent girth on red pine. Scattered cherry and oaks amid the rows. Some scattered large white pine. Stand is divided by firebreak and Riverview Rd. Firebreak is filling in with woody species, however, so may not be effective as such. Private property boundary along north edge is fenced and posted. Military lease land.
8	42290 - Natural Mixed Pine	Low Density Sapling	71.5	30		Opening that is filling in. More and larger jack pine and white pine (in clumps) than adjacent U-type. Roller chopped in 1983. ORV route runs on two-track along north edge of stand. Military lease land.
10	42220 - Natural Jack Pine	Low Density Sapling	28.6	18		Clearcut (except oak) in winter 1995-1996 as part of Yellowtree Jack Pine sale, 61-014-93-01. Most of the clearcut area was trenched and seeded but this was not. Regeneration was spotty since much of the western part of the stand appears rather wet. Military lease land.
11	4133 - Aspen, Mixed Pine	High Density Pole	4.9	40		Variable stand. Mostly aspen with some pine at south end and scattered oaks. Military lease land.



	Level 4 Cover Type	Size Density	Acres	Stand Age	BA Range	General Comments:
12	42110 - Planted Red Pine	High Density Pole	75.8	56	111-140	Third row thinned as part of Yellow Trees Red Pine sale, 61-024-05-01, completed July 2009. Included 33' clearcut area along eastern edge of stand to serve as a firebreak. Very few non-pine trees within rows.
13	42290 - Natural Mixed Pine	High Density Log	20.0	101	141-170	Variable stand. Probably upland overall but is wetter around the edges especially the western edge and in interior pockets. Canopy is large red and white pine with understory of spruce. Biggest pine is in the southern 2/3 of stand with more jack pine and spruce in canopy at north end. Western edge of stand seems wetter and is more of a spruce stand. Evidence of significant deer numbers. Very heavy browse on red maple seedlings. Evidence of past fire. A few rows of planted red pine at very northern tip of stand.
15	6126 - Lowland Jack Pine	Low Density Sapling	4.5	18		Clearcut (except oak) in winter 1995-1996 as part of Yellowtree Jack Pine sale, 61-014-93-01. Then trenched and seeded with jack pine seeds. This part of plantation appears rather wet and regeneration was poor.
16	42110 - Planted Red Pine	High Density Pole	22.9	56	171-200	Purchased from Consumers Power in 1994 but had a private lease until 2011. Should be third row thinned now. Will probably need survey work to identify southern boundary.
17	42120 - Planted Jack Pine	High Density Sapling	53.4	18		Clearcut (except oak) in winter 1995-1996 as part of Yellowtree Jack Pine sale, 61-014-93-01. Then trenched and seeded with jack pine seeds. OI noted some issues with regeneration due to deer browse and blister rust. Problems appear patchy. A few overstory oaks and some seedling-/sapling-sized spruce. Drainage runs through stand in southwest corner.
18	4199 - Other Mixed Upland Deciduous	Low Density Pole	8.6	55		Purchased from Consumers Power in 1994 but had a private lease until 2011. Poor quality timber. Many smaller openings filling in with cherry and red maple. Heavily browsed. Overhead powerline runs through center of stand. Two driveways for access to private property to the east run through the stand.
19	42110 - Planted Red Pine	High Density Pole	209.0	51	111-140	Third row thinned as part of Yellow Trees Red Pine sale, 61-024-05-01, completed July 2009. Moderate slash as you would expect from recent thinning. Road has been rerouted to basically follow state/private boundary along much of eastern edge of stand. Occasional large oak and pine in the middle of rows.
20	42210 - Natural Red Pine	Medium Density Log	11.6	51	171-200	Stand appears to be a mixture of semi-open areas (north), planted red pine (central) and jack pine (south). Most, if not all, of the red pine did not get thinned with the adjacent row thinning because it was poorly stocked in the first place.
21	6117 - Lowland Deciduous, Mixed Coniferous	Medium Density Pole	6.0	128		Adjacent to Manistee River. Some shrubby, nonforested areas at river's edge. Overhead powerline runs through stand along Yellowtrees Road. Mixture of upland areas, mostly along the road, and lower areas closer to the river. Elevation drops off significantly from road. A few large oaks along the road.



	Level 4 Cover Type	Size Density	Acres	Stand Age	BA Range	General Comments:
22	6127 - Lowland Pine	High Density Pole	4.8	128		Adjacent to Manistee River. Wet ground throughout. Some shrubby non-forested areas along the river. Significantly lower than Yellowtrees Road and adjacent stand. Evidence of high deer numbers. Numerous blowdown trees, high coarse woody debris.
24	42200 - Natural White Pine	High Density Log	4.5	88	111-140	Topo shows this as a wet stand but it is relatively dry compared to surrounding areas. Has some wet pockets, though, and access would be difficult. Good quality, tall red and white pine with scattered canopy gaps. Good development of understory. Some spruce is pole-sized. Very heavy browse on red maple seedlings, less than 3' tall.
25	42120 - Planted Jack Pine	High Density Sapling	9.7	18		Clearcut (except oak) in winter 1995-1996 as part of Yellowtree Jack Pine sale, 61-014-93-01. Then trenched and seeded with jack pine seeds. Excellent regeneration. OI noted regeneration setbacks from deer browse and blister rust.
27	6122 - Black Spruce	High Density Pole	42.1	93	111-140	Stand is not overly wet but ground is hummocky so there are wet pockets. Scattered areas of dense alder in understory. Heavy browse on red maple seedlings in understory.
28	6127 - Lowland Pine	High Density Log	2.1	93		Variable stand on hummocky, wet ground. Includes some dry areas. Significant deer browse on red maple seedlings.
29	6120 - Lowland Cedar	High Density Pole	4.4	128		Low stand near Manistee River. Evidence of significant deer population. Lots of coarse woody debris. Cedar is denser in middle of stand with scattered white pine and other species along the edges.
30	42220 - Natural Jack Pine	Low Density Sapling	4.2	37		Stand is an opening that is filling in. Evidence of fire.
31	42200 - Natural White Pine	High Density Pole	9.2	46	81-110	The northern part of the stand appears to be white pine planted in 1967. It was part of a larger stand, the rest of which has since been harvested and converted to jack pine. The white pine is poor quality and form -- limby and many trees with multiple leaders. The southern third of the stand is natural jack pine of merchantable size. Evidence of past fire.
32	42110 - Planted Red Pine	High Density Pole	7.3	51	171-200	Similar to stand to north but was under private lease until 2011. Should be third row thinned now.
33	4112 - Maple, Beech, Cherry Association	Low Density Log	1.6	83	1-50	Contains Yellowtrees Access Site on the Manistee River, vehicle turnaround and limited parking. Very open canopy with a few large trees and shrubby understory. North boundary is against private property but is not marked.
34	4191 - Mixed Upland Deciduous with Conifer	Medium Density Log	3.0	67		Adjacent to Manistee River, wet on eastern end. Stand used to have some aspen and red pine but almost all has died. Was part of private lease until 2011 and has remnants of an old camp: overhead electric lines, well, wire gate and old furniture.



	Level 4 Cover Type	Size Density	Acres	Stand Age	BA Range	General Comments:
35	6127 - Lowland Pine	High Density Log	11.1	98	111-140	Slightly more upland than stand to south but still mostly wet. Canopy of large white and red pine with understory of spruce and smaller white pine. Most of stand was part of private lease until 2011. Contains grassy/shrubby opening too small to map in northeast corner.
37	42120 - Planted Jack Pine	High Density Sapling	13.5	18		Clearcut (except oak) in winter 1995-1996 as part of Yellowtree Jack Pine sale, 61-014-93-01. Then trenched and seeded with jack pine seeds. Excellent regeneration. OI noted regeneration setbacks from deer browse and blister rust.
38	6120 - Lowland Cedar	High Density Log	50.5	112		Stand is a combination of dense cedar pockets with other areas of more open canopy and dense tag alder and blackberry. Black Creek runs along eastern edge. Part of south end of stand was harvested (all species greater than 1") for emergency deer feeding in 1982. Lots of deer activity.
41	6129 - Mixed Coniferous Lowland Forest	High Density Pole	35.6	113	81-110	Stand is mixture of small diameter dense swamp conifers. Some wetter areas have sparse canopies and heavy tag alder. Lots of evidence of deer activity. Much of south part of stand was acquired since last inventory.
42	6132 - Mixed Lowland Forest with Cedar	Low Density Pole	60.9	83		Very wet stand. Northern and western parts are mostly tag alder with very sparse tree canopy cover. More cedar in eastern part of stand. Very few supercanopy white pine. Ash shows damage and mortality due to EAB. Records of cutting for emergency deer feeding in 1982.
44	4311 - Pine, Aspen Mix	Medium Density Log	19.1	35		Variable, two-aged stand. Was typed as U0 in OI but has large white and red pine in super-canopy with multiple pockets of merchantable aspen. Younger aspen is also filling in other canopy gaps. Lots of red maple seedlings but heavily browsed. Stand has rolling topography, dropping off sharply to wet areas on all sides. Road to access stand follows a narrow ridge. Network of roads on west side to access private properties to west. Well site permit approved in 1983. Texaco #14, for seismic survey, 1/4 acre. Aspen, red maple, paper birch, and white cedar were selectively cut for emergency deer feeding in 1982.
45	6122 - Black Spruce	Medium Density	4.8	53		Wet with sparse canopy.
46	6127 - Lowland Pine	High Density Log	27.6	113	81-110	Stand includes upland and lowland areas and is wetter along edges. Contains some very large white pine but BA is low overall due to scattered canopy gaps. Heavy white pine understory but mostly suppressed. Some cedar and red pine in the understory is reaching pole size. Spruce understory is heavy in southwest corner of stand. Some large blowdown trees along edge so coarse woody debris is high. Evidence of past fire and high deer activity. Adjacent to Manistee River along northeast edge. Consider Natural Rivers status. BA by species: 1: WP 50, RM 40; 2: WP 30, RM 10, spruce 10
49	4139 - Aspen, Mixed Deciduous	Low Density Pole	1.4	67		Stand is isolated upland surrounded by wetter stands. Sparse canopy with poor quality trees.



	Level 4 Cover Type	Size Density	Acres	Stand Age	BA Range	General Comments:
50	6120 - Lowland Cedar	High Density Pole	5.0	87		Stand is adjacent to the Manistee River and mostly wet. Scattered canopy gaps with dense tag alder. Some human activity from nearby camps.
51	6118 - Lowland Deciduous with Cedar	High Density Log	28.4	47		Stand is a mixture of lowland aspen and areas of pure tag alder, but there is significant aspen volume. Some aspen is older and is starting to decline. Diameters vary from pockets of 10" average to 6" average. Trace of paper birch and a few large white pine. Ash has EAB. Black Creek runs through stand but is not mapped correctly. Some areas are probably pretty wet based on wetland ferns visible despite the snow. Evidence of deer and beaver activity. Part of stand was treated in 1982 with limited cutting: 15 sf/acre of aspen, paper birch, maple and cedar.
53	6128 - Lowland Coniferous, Mixed Deciduous	Medium Density Pole	49.0	77	51-80	Adjacent to Manistee River. Very wet stand. Overall canopy is more sparse than other stands nearby. Dense tag alder throughout. Canopy is variable with some pockets of pure cedar and some with more ash. Scattered supercanopy white pine. Ash is infested with EAB but not worth harvesting due to wet ground and small diameters. Evidence of high deer numbers.
54	6112 - Lowland Aspen	Low Density Pole	28.9	25		Stand is a mixture of nonforested lowland shrub (tag alder) and clumps of pole/sapling sized aspen with a few cedar. Very wet. Black Creek runs through stand. Evidence of cutting for emergency deer feeding in mid-1980s. Was typed as LO in OI but aspen has filled in enough to call this a forested stand.
58	42110 - Planted Red Pine	High Density Pole	3.4	53	111-140	Most of stand was thinned with adjacent compartment, 128 River Pine (61-032-09-01), winter 2011-2012. Due to tight row spacing, 2 rows were cut and 2 were left. A small part (less than 1 acre) was not thinned because it was acquired recently. Very few trees of other species within rows.
60	6120 - Lowland Cedar	High Density Log	5.7	87		Relatively narrow band of cedar adjacent to Manistee River. River is a few feet lower than this stand so it seems relatively upland but has wet spots and is likely subject to flooding. Black Creek enters the Manistee in the western edge of this stand. Lots of deer and beaver activity. Numerous private cabins on the other side of the river. This land was acquired since the last inventory.



Stand	Cover Type	Acres	Managed Site	Management Priority (Objective)	General Comments:
5	3303 - Mixed Low Density Trees	471.4	Yes	Medium (NonForested)	<p>WLD attempts to keep much of this area open with prescribed burning. Central section was last burned in April 2008 (FTP W-62-714). Unit 2 was 386 acres out of approximately 750 acres mapped as burn units (including Compartment 122). Woody vegetation is still thick with jack pine saplings, clumpy black cherry sprouts, heavily browsed oak and even some log-sized oaks and pines. Jack pine is fairly large in Unit 1 (between PreInventory Stands 7 and 12). Was roller chopped in 1983.</p> <p>ORV route runs through opening. AT&T fiberoptic line runs on old railroad grade along the north edge of the stand. The grade is built up along much of its length. Part of military lease land.</p>
9	320 - Upland Shrub	1.0	No	Unspecified	Abandoned well site that is filling in with cherry and other brushy vegetation. Used as landing and bermed at southwest corner. Military lease land.
14	310 - Herbaceous Openland	1.3	No	Unspecified	Former well pad. Very open with a few shrubby cherry trees.
23	50 - Water	1.6	No	Unspecified	Manistee River.
26	330 - Low-Density Trees	10.9	No	Unspecified	Former opening mostly filling in with cherry sprouts and few scattered log- and pole-sized white pine and oaks. Was disked, fertilized and planted with rye in 1974.
36	622 - Lowland Shrub	3.2	No	Unspecified	Low area in bend of the Manistee River. Mostly dense tag alder with a couple pockets of trees -- cedar, paper birch and a few large white pine.
39	622 - Lowland Shrub	6.8	No	Unspecified	Low area next to Manistee River. Wet to very wet. Very few trees in southern part. Lots of deer activity.
40	622 - Lowland Shrub	11.5	No	Unspecified	Very wet perhaps due to beaver activity. Section along north line is upland with some aspen, cedar, and paper birch.
43	50 - Water	6.9	No	Unspecified	Manistee River.
47	330 - Low-Density Trees	9.5	No	Unspecified	Mostly upland but there are some wet spots and drainages. Scattered trees including some shrubby cherry, a few L/XL white pines, and at least one aspen clone. Some debris from adjacent camp in northwest corner. Part is adjacent to Manistee River. Private property to east (gap in state ownership) is protected by GTRLC conservation easement.
48	629 - Mixed non-forested wetland	26.2	No	Unspecified	Low area adjacent to Manistee River. Contains scattered trees.



Stand	Cover Type	Acres	Managed Site	Management Priority (Objective)	General Comments:
52	629 - Mixed non-forested wetland	22.8	No	Unspecified	Adjacent to Manistee River. Stream runs through stand. Contains some scattered trees. May have supported road to aspen stand to the west at one time.
55	330 - Low-Density Trees	2.8	No	Unspecified	Isolated upland adjacent to Manistee River. Scattered large white pine, a few jack pine and a few cherry, aspen and red maple seedlings.
56	50 - Water	14.9	No	Unspecified	Manistee River.
57	629 - Mixed non-forested wetland	4.2	No	Unspecified	Low area adjacent to Manistee River. Mostly tag alder with a few scattered trees.
59	50 - Water	6.2	No	Unspecified	Manistee River.