



# Compartment Review Presentation

## Grayling Forest Management Unit

Compartment 72190

Entry Year 2018

Acreage: 901

County Crawford

Management Area: AuSable Outwash

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**Revision Date:** 2016-07-19

**Stand Examiner:** Joan Charlebois

**Legal Description:**

T25N R04W Sections 16 & 17

**Identified Planning Goals:**

To maintain forest health, productivity, sustainability, species diversification, and structural diversity throughout the compartment while providing for multiple use and visual management. The State ownership is under a 10-year management agreement with the Michigan National Guard. This agreement allows for camping and maneuvers, but does not allow use of heavy equipment or high intensity live ammunition firing. Tracked vehicles are prohibited on these lands except to cross on designated tank trails. Wheeled vehicles are restricted to existing trails and are not to be driven cross country. Michigan Department of Natural Resources management activities take precedence on these lands, though management activities are often tailored to be compatible with National Guard training needs.

**Soil and topography:**

Nearly all of the compartment is on Graylcalm-Grayling sands, with small inclusions of Grayling sand. Terrain is nearly level outwash plain, with slopes increasing to the north.

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

The compartment is within the Beaver Creek oil field, with extensive mineral development. Much of the private interface is industry-owned, with gas processing facilities.

**Unique Natural Features:**

There is the potential for rare plants and animals to be associated with the compartment's dry outwash jack pine plains.

**Archeological, Historical, and Cultural Features:**

There are no known concerns within the compartment.

**Special Management Designations or Considerations:**

The 10-year Military lease and mineral development leases are a consideration when planning forest management within the compartment.

**Watershed and Fisheries Considerations:**

The compartment has no surface water features.

**Wildlife Habitat Considerations:**

The compartment's mix of pine, oak & aspen provides habitat for a variety of game and non-game wildlife.

**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 400 and 600 feet. Beneath the glacial drift is the Michigan Formation. The Michigan is quarried for gypsum elsewhere in the State. A gravel pit is located in Section 9 and potential is good on the upland areas. The entire compartment is leased for oil and gas and part of it is in the Beaver Creek Field. The field has produced over 21 MBO from the Devonian Richfield and over 5 Bcf gas from the Ordovician Prairie du Chien.

**Vehicle Access:**

County roads include Tower Hill Truck Trail, Seven Mile, Goetsch and Puffin Roads. Additional access is provided by the network of gas well roads.

**Survey Needs:**

The E1/2 of the SE of section 17 will need four corners established for future management.

**Recreational Facilities and Opportunities:**

There are no developed trails or facilities but opportunities exist for dispersed recreation such as hunting and gathering.

**Fire Protection:**

The compartment is designated as a no-plow zone due to its pipelines and sour gas wells. Access for fire equipment is adequate on the network of gas well roads. The Beaver Creek Fire Department is the best nearby water source.

**Additional Compartment Information:****The following reports from the Inventory are attached:**

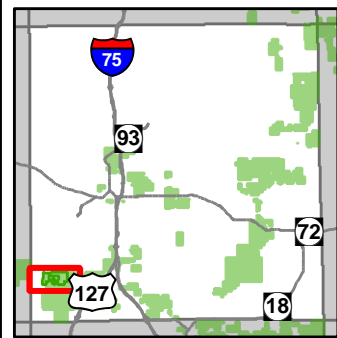
- Total Acres by Cover Type and Age Class**
- Cover Type by Harvest Method**
- Proposed Treatments – No Limiting Factors**
- Proposed Treatments – With Limiting Factors**
- Stand Details (Forested and Nonforested)**
- Dedicated and Proposed Special Conservation Areas**
- Site Condition Details**

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

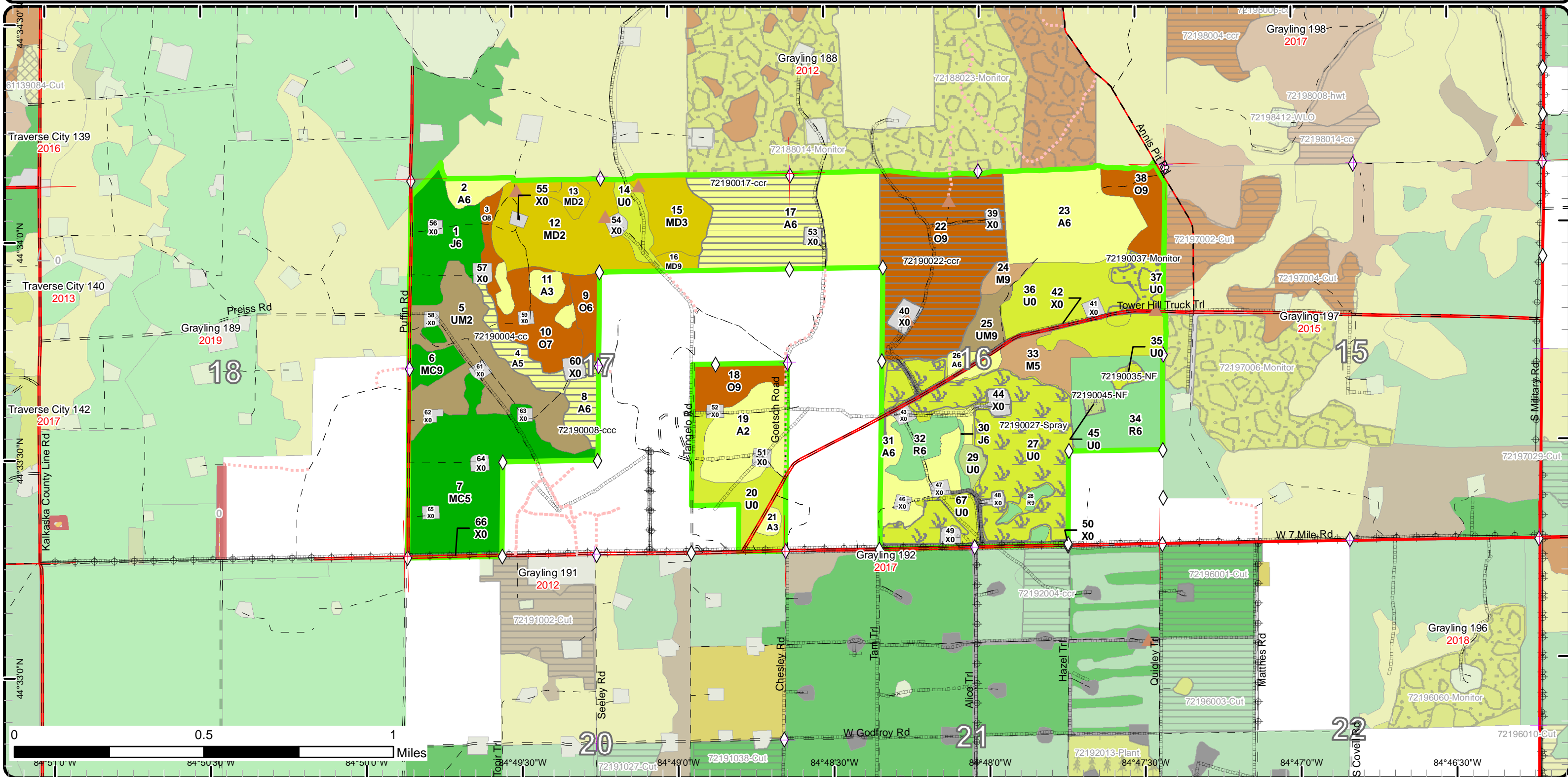
- Base feature information, stand boundaries, cover types, and numbers**
- Proposed treatments**
- Site condition boundaries**
- Details on the road access system**

# Cover Type & Treatments Map

Compartment: 190  
 T25N, R04W, Sec: 16-17  
 County: Crawford  
 Unit: Grayling  
 Mgmt Area: AuSable Outwash  
 YOE: 2018  
 Acres: 901 GIS Calculated  
 Examiner: Joan Charlebois  
 Map Revised: 3/9/2017  
 Map Phase: Post-Review



- Miris Corners
- + Remonumented Section Corners
- Field Grade GPS Corners
- Berms
- County Paved Roads
- County Gravel Roads
- Gravel Roads
- County Poor Dirt Roads
- Poor Dirt Roads
- Closed
- Pipeline
- Powerline
- Compartment Boundary
- Clearcut (w/Reserves)
- Pesticide
- Other Treatment - See Comments
- Regeneration Survey
- 411 - Northern Hardwood
- 412 - Oak Types
- 413 - Aspen Types
- 419 - Mixed Upland Deciduous
- 421 - Planted Pines
- 422 - Natural Pines
- 430 - Upland Mixed Forest
- 110 - Low Intensity Urban
- 122 - Roads/Parking Lot
- 320 - Upland Shrub
- 330 - Low Density Trees



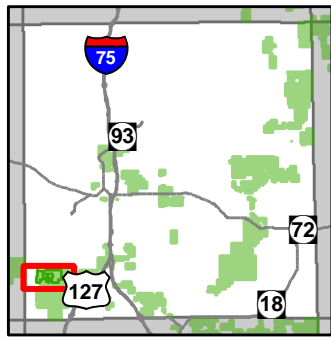




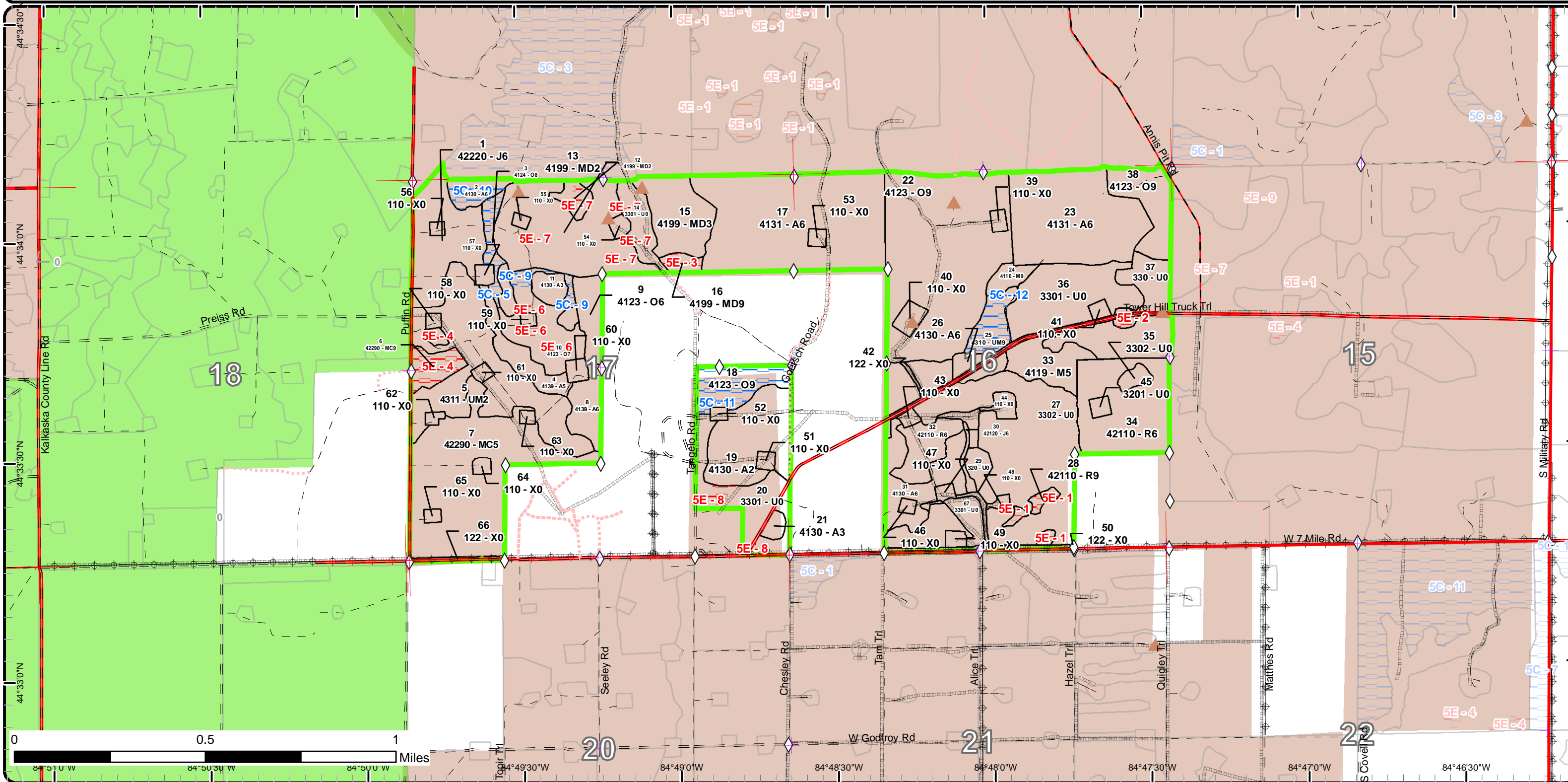


# Special Conservation Areas & Site Conditions Map

Compartment: 190  
 T25N, R04W, Sec: 16-17  
 County: Crawford  
 Unit: Grayling  
 Mgmt Area: AuSable Outwash  
 YOE: 2018  
 Acres: 901 GIS Calculated  
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- Miris Corners
- + Remonumented Section Corners
- ◇ Field Grade GPS Corners
- ▲ Berms
- County Paved Roads
- County Gravel Roads
- Gravel Roads
- County Poor Dirt Roads
- Poor Dirt Roads
- - - Closed
- Pipeline
- ⊕ Powerline
- Compartment Boundary
- Available w/ Constraints
- - - Unavailable
- - - 5C: Delay treatment for age/size class diversity or exceptional site quality
- - - 5E: Long-Term Retention
- Stand Boundaries
- Kirtland Warbler Habitat
- Research, Development, and Military Lands



# Report 1 – Total Acres by Cover Type and Age Class

Grayling Mgt. Unit

Compartment 190 Year of Entry 2018

Joan Charlebois : Examiner



## 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	30	0	34	125	25	0	0	0	0	0	0	0	0	0	0	0	0	214
Jack Pine	0	0	0	2	0	28	0	0	0	0	0	0	0	0	0	0	0	0	30
Low-Density Trees	182	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	182
Mixed Upland Deciduous	0	66	4	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	73
Natural Mixed Pines	0	0	0	0	0	68	0	9	0	0	0	0	0	0	0	0	0	0	77
Northern Hardwood	0	0	0	13	0	0	0	0	0	0	4	0	0	0	0	0	0	0	17
Oak	0	0	0	0	0	0	9	0	0	0	14	126	0	0	0	0	0	0	149
Red Pine	0	0	0	45	0	0	0	0	4	0	0	0	0	0	0	0	0	0	49
Upland Mixed Forest	0	51	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	60
Upland Shrub	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
Urban	46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	46
<b>Total</b>	<b>233</b>	<b>147</b>	<b>4</b>	<b>94</b>	<b>125</b>	<b>121</b>	<b>9</b>	<b>9</b>	<b>13</b>	<b>0</b>	<b>18</b>	<b>129</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>902</b>



## Report 2 – Treatment Summary

Grayling Mgt. Unit

Year of Entry: 2018

Compartment 190

Total Compartment Acres: 901

### Acres of Harvest

Commercial Harvest - 154  
 Harvests with Site Condition - 0  
 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	70	0	0	0	0	0	0	0	0	70
Oak	85	0	0	0	0	0	0	0	0	85
<b>Total</b>	<b>154</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>154</b>

### Proposed and Next Step Treatments by Method

	Harvest	Site Prep	Planting	Seeding	Burning	Pesticide	Monitoring	Other	Non-Forest Mgt.	Total Acres
Current	154	0	0	0	0	78	9	0	4	246
Next Step	0	0	0	0	0	0	310	0	0	310
<b>Total</b>	<b>154</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>78</b>	<b>320</b>	<b>0</b>	<b>4</b>	<b>556</b>



Standard

Standard	Treatment Name	Acres	Stand CoverType	Size Density	Stand Age	BA Range	Treatment Type	Treatment Method	Cover Type Objective	Age Structure	Approval Status
4	72190004-cc	10.0	4139 - Aspen, Mixed Deciduous	Poletimber Medium	49	51-80	Harvest	Clearcut	4139 - Aspen, Mixed Deciduous	Even-Aged	Draft Field Boundary

**Habitat Cut: No**

**Site Condition:**

Prescription Specs: Cut 2"+ DBH except leave the super-canopy RP-WP and some of the xlog open-grown oak. Include drumming log spec. No other designated retention due to the stand's small acreage and aspen M.O.

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

Acceptable Regen: A moderately stocked mix of A-RM-O with lower stocking/upland brush expected along the southwest edge where the current canopy is sparser.

Other Comment: Protect mast-producing shrubs. Marked and unmarked surface pipelines are present within this section of state land.

Proposed Start Date: 10/01/2017

8	72190008-ccc	9.4	4139 - Aspen, Mixed Deciduous	Poletimber Well	49	81-110	Harvest	Clearcut	4139 - Aspen, Mixed Deciduous	Even-Aged	Draft Field Boundary
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**Habitat Cut: No**

**Site Condition:**

Prescription Specs: Cut 2"+ DBH except leave the super-canopy RP-WP and some of the xlog open-grown oak. Add drumming log spec. No other designated retention due to the stand's small acreage and aspen M.O.

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

Acceptable Regen: A moderately stocked mix of A-RM-O with lower stocking/upland brush expected along the southwest edge where the current canopy is sparser.

Other Comment: Protect mast-producing shrubs. Marked and unmarked surface pipelines are present within this section of state land.

Proposed Start Date: 10/01/2017

17	72190017-ccr	50.1	4131 - Aspen, Oak	Poletimber Well	38	51-80	Harvest	Clearcut with Retention	413 - Aspen	Even-Aged	Draft Field Boundary
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**Habitat Cut: No**

**Site Condition:**

Prescription Specs: Final harvest with retention. Can leave up to an additional 10 acres in islands to conserve oak, but those acres will not be designated as long-term retention. Add pipeline specs, harvest everything 2" and up.

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

Acceptable Regen: Medium to well stocked stand of aspen and associated species.

Other Comment: Evaluate potential green-up concern with comp 188 stand 14 and address as needed at time of sale prep.

Proposed Start Date: 10/01/2017

22	72190022-ccr	84.5	4123 - Red Oak	Sawtimber Well	101	51-80	Harvest	Clearcut with Retention	412 - Oak Types	Even-Aged	Draft Field Boundary
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**Habitat Cut: No**

**Site Condition:**

Prescription Specs: Cut stems 2"+ DBH except leave standard retention. Evaluate oak & aspen regen protection needs. Consider focusing retention along the stand's north and south edges to address potential green-up concerns.

Next Step Treatments: Monitoring, Natural Regen (Intermediate)

Acceptable Regen: A moderately stocked mix of oak, aspen & RM. If the regen does not have a significant oak component, consider changing the M.O. to planted RP. In the event of that switch, initiate site prep and follow-up treatments (which may include herbicide) to ensure successful establishment of RP.

Other Comment: Marked and unmarked surface pipelines are present within this section of state land.

Proposed Start Date: 10/01/2017





Stand Name	Treatment Name	Acres	Stand CoverType	Size Density	Stand Age	BA Range	Treatment Type	Treatment Method	Cover Type Objective	Age Structure	Approval Status
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27	72190027-Spray	78.2	3302 - Low Density Conifer Trees	Nonstocked	0	Unspecified	Pesticide	Aerial	42110 - Planted Red Pine	Even-Aged	Draft Field Boundary
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**Habitat Cut: No**

**Site Condition:**

Prescription Approved to herbicide stand through variance on 2-10-2017.

Specs:

Next Step Monitoring, Artificial Regen(1yr); Monitoring, Artificial Regen(3yr)

Treatments:

Acceptable full stocking in RP

Regen:

Other Percent to Treat = 100%

Comment:

Proposed Start Date: 08/01/2017

35	72190035-NF	2.6	3302 - Low Density Conifer Trees	Nonstocked		Unspecified	NonForestMgt	Other - Specify	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, liming, food plot seeding, no-till prairie grass seeding, mowing, brushing, burning, herbicide application, and planting of mast producing tree and shrubs along opening edges.

Specs:

Next Step

Treatments:

Acceptable

Regen:

Other

Comment:

Proposed Start Date: 10/01/2017

37	72190037-Monitor	9.4	330 - Low-Density Trees	Nonstocked	0	Unspecified	Monitoring	Natural Regen (Intermediate)	4199 - Other Mixed Upland Deciduous	Even-Aged	Draft Field Boundary
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**Habitat Cut: No**

**Site Condition:**

Prescription Monitor regen. Failed initial check during 2018 YO E re-inventory, but the decision was made at the Comp Review to allow more time for the regen to fill in, and if planting is needed, to have the option for herbicide and site prep as needed to secure the RP establishment.

Specs:

Next Step

Treatments:

Acceptable Oak is the desired cover type, but any mix of RM-O-A-RP-WP that meets minimum stocking is acceptable. If nat regen fails, plant RP, with herbicide and site prep as needed.

Other The large RO that were cut either didn't sprout at all or sprouted feebly and were heavily browsed. The RM was heavily browsed also. Stand was chipped but there is a fair amount of residual slash.

Proposed Start Date: 10/01/2018

45	72190045-NF	1.6	3201 - Sweet Fern	Nonstocked		Unspecified	NonForestMgt	Other - Specify	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, liming, food plot seeding, no-till prairie grass seeding, mowing, brushing, burning, herbicide application, and planting of mast producing tree and shrubs along opening edges.

Specs:

Next Step

Treatments:

Acceptable

Regen:

Other

Comment:

Proposed Start Date: 10/01/2017

**Total Treatment Acreage Proposed: 245.8**

## Report 4 – Site Conditions

Grayling Mgt. Unit  
Joan Charlebois : Examiner

Compartment: 190  
Year of Entry: 2018

### Availability for Management

Total Acres	Acres Available	Acres Avail		Dominant Site Conditions	5C	5E
		With Condition	Not Available			
215	209	6	0	Aspen	6	
30	30	0	0	Jack Pine		
182	178	0	4	Low-Density Trees		4
73	68	0	5	Mixed Upland Deciduous		5
76	67	0	9	Natural Mixed Pines		9
17	17	0	0	Northern Hardwood		
149	125	22	1	Oak	22	1
49	46	0	4	Red Pine		4
59	51	9	0	Upland Mixed Forest	9	
5	5	0	0	Upland Shrub		
46	46	0	0	Urban		0
901	842	37	22	Total Forested Acres	37	22
	93%	4%	2%	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	Unavailable	5E: Long-Term Retention	4	Unspecified	Unspecified	Unspecified	Unspecified
<b>Comments:</b> Retention islands left in harvest #035-12.							
2	Unavailable	5E: Long-Term Retention	1	Unspecified	Unspecified	Unspecified	Unspecified
<b>Comments:</b> Retention island excluded from harvest #041-12.							
3	Unavailable	5E: Long-Term Retention	3	Unspecified	Unspecified	Unspecified	Unspecified
<b>Comments:</b> Boundary-excluded retention for #004-08.							



## Report 4 – Site Conditions

Grayling Mgt. Unit

Joan Charlebois : Examiner

Compartment: 190

Year of Entry: 2018

4	<b>Unavailable</b>	<b>5E: Long-Term Retention</b>	9	2H: Blocked by physical obstacle (e.g. upland stand in a lowland area)	Unspecified	Unspecified	Unspecified
<b>Comments:</b> Were left as the modified retention islands within a 2009 harvest (#006-08). Original islands were re-aligned to leave the portions that could not be safely harvested due to surface pipelines criss-crossing through carrying hydrogen sulfide gas.							
5	<b>Available</b>	<b>5C: Delay treatment for age/size class diversity or exceptional site quality</b>	5	Unspecified	Unspecified	Unspecified	Unspecified
<b>Comments:</b> Narrow two-aged strip left when adjacent stands were cut. Was not designated retention though.							
6	<b>Unavailable</b>	<b>5E: Long-Term Retention</b>	1	Unspecified	Unspecified	Unspecified	Unspecified
<b>Comments:</b> Designated retention islands within harvest #006-08.							
7	<b>Unavailable</b>	<b>5E: Long-Term Retention</b>	3	Unspecified	Unspecified	Unspecified	Unspecified
<b>Comments:</b> Retention left in harvest #004-08.							
8	<b>Unavailable</b>	<b>5E: Long-Term Retention</b>	2	Unspecified	Unspecified	Unspecified	Unspecified
<b>Comments:</b> Boundary-excluded retention for harvest #002-08.							
9	<b>Available</b>	<b>5C: Delay treatment for age/size class diversity or exceptional site quality</b>	3	Unspecified	Unspecified	Unspecified	Unspecified
<b>Comments:</b> Boundary-excluded from harvest #006-08, but not indicated as designated retention in the closed timbersale file.							

## Report 4 – Site Conditions

Grayling Mgt. Unit

Joan Charlebois : Examiner

Compartment: 190

Year of Entry: 2018

10	Available	5C: Delay treatment for age/size class diversity or exceptional site quality	6	Unspecified	Unspecified	Unspecified	Unspecified
<b>Comments:</b> This small stand is part of the larger type captured in comp 188 stand 4, most of which also burned in the Fletcher Rd Fire. Consider merging it with comp 188.							
11	Available	5C: Delay treatment for age/size class diversity or exceptional site quality	14	Unspecified	Unspecified	Unspecified	Unspecified
<b>Comments:</b> Consider holding this YOE due to majority Non-Forested or immature cover in this block of state land.							
12	Available	5C: Delay treatment for age/size class diversity or exceptional site quality	9	Unspecified	Unspecified	Unspecified	Unspecified
<b>Comments:</b> Consider treating next YOE with stand 24. The adjacent higher-risk oak stand 22 is the priority to treat this YOE.							



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	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.
HCVA	Designated Critical Habitat	Critical habitat areas are established via a consultative and cooperative process between the DNR and the U.S. Fish and Wildlife service for the recovery of threatened and endangered species, as governed by Part 365, Endangered Species Protection, of the Natural Resources and Environmental Protection Act, 1994 PA 451, and the Federal Endangered Species Act of 1973. This is an active program, with proposed species plans in various stages of review. As of now only two exist, Kirtland Warbler Habitat and Piping Plover Habitat.





	Level 4 Cover Type	Size Density	Acres	Stand Age	BA Range	General Comments:
1	42220 - Natural Jack Pine	Poletimber Well	28.0	49	51-80	Burned within the May 8, 1968 Fletcher Road Fire. The fire didn't kill the entire stand, leaving now overmature JP scattered above the majority pole-sapling JP that regenerated after the fire. Age source of "cutting record" is the fire event, not a harvest, although it took some time for the JP to establish (poles cored came in 2-3 years shy of 48 years). Patches of QA regenerated with the JP; the largest clone is in the stand's SW. The aspen is poor-quality, with false tinder fungus, heart rot & top mortality. There is breakage in the suppressed JP also, thinning down to the low end of the 75-100% canopy cover category. Note that the overmature JP averages 10" DBH and lands in the log category, not the canopy-listed 18" DBH xlog. This is a two-aged stand, but a MiFI error won't allow a species to be listed twice unless the second age class differs by two size classes. The 48 year old JP splits the Pole-Sapling category, but couldn't be listed as such without also triggering a MiFI error.
2	4130 - Aspen	Poletimber Well	5.9	49	51-80	Burned within the May 8, 1968 Fletcher Road Fire. QA with BTA in the east end. Some residual oak & cull RM saw. QA thinning down; false tinder fungus, top mortality present. Most of the overmature JP has died out.
3	4124 - Red with White Oak	Sawtimber Medium	5.4	102	51-80	Edge stand, picks up mature oak & RM excluded from adjacent harvests to the east and pole-sized regen from the 1968 Fletcher Road Fire in the west edge (mostly RM, some JP & PB). Below the mature oak, there is some RM & BTA regen slop-over from the adjacent harvests. Some hawthorn patches on the more open west edge.
4	4139 - Aspen, Mixed Deciduous	Poletimber Medium	10.0	49	51-80	Edge stand between the better quality oak site to the east and the JP flats to the west. Cover is a mosaic of dense RM pole cover, aspen clones (previous inventory age 48) and upland brush, with mature oak scattered above. There's a minor component of mature cull saw RM also. The QA is breaking up, with false tinder fungus and heart rot. The BTA is holding up better. The stand's west edge is sparser, with pine mixing in and good mast-producing shrub cover.
5	4311 - Pine, Aspen Mix	Sapling Medium	50.6	8	Immature	Was final harvested in 2009 (#006-08), 2"+ DBH except RP, WP, green-marked trees, and retention islands. The original islands were re-aligned through contract amendment to leave the portions that could not safely be harvested due to surface pipelines criss-crossing through. Large areas regenerated to J3, dense regen that wasn't confined to landings and main skid routes. A3 mixes in along the stand edges. The oak includes vigorous stump-origin regen from the cut and larger sapling-pole residual. Residual WP-RP-JP is distributed unevenly across the stand. An uncut acre of LDT JP in the NE is included in the stand. The residual JP is Pole-Log in size, but had to call it Log in the canopy listing to work around an arbitrary MiFI rule. Regen cover is variable and uneven, ranging from overstocked to non-forested upland shrub, and artificially averages out to medium.



	Level 4 Cover Type	Size Density	Acres	Stand Age	BA Range	General Comments:
6	42290 - Natural Mixed Pine	Sawtimber Well	8.8	66	81-110	Were left as the modified retention islands within a 2009 harvest (#006-08). Original islands were re-aligned to leave the portions that could not be safely harvested due to surface pipelines criss-crossing through. South end was within a seed tree harvest, cut between 1966-1969 (#90-66A), spec'd to remove merch JP except the marked-to-leave seed source. Rest was within a 1970 improvement harvest (#002-70), spec'd to cut merch JP. The stand has more residual that regen from the cuts, with only the aspen likely dating to the harvests. That aspen is poor quality. The overmature JP is breaking up. The proportion in WP & RP is increasing as the JP drops out. The stand's north poly is majority WP.
7	42290 - Natural Mixed Pine	Poletimber Medium	67.5	48	51-80	Was seed tree harvested between 1966-1969 (#90-66A), cutting merch JP except the marked-to-leave seed source. The overmature JP seed trees occupy a supercanopy layer above the majority JP pole regen from the cut. The canopy is sparser and dominated by that older component where regen didn't establish. Upland brush inclusions are common. Patches of aspen were noted within the harvest and date to around that cutting. Clone health & quality varies but is generally poor. Note that the JP seed trees ave 12" DBH and land in the log category, not the canopy-listed 18" DBH xlog. This is a two-aged stand, but a MiFI error won't allow a species to be listed twice unless the second age class differs by two size classes.
8	4139 - Aspen, Mixed Deciduous	Poletimber Well	9.4	49	81-110	East edge of the stand may have been part of the 1963 timber trespass noted in the stand to the north. Poles cored in the west half ran 48 years old. Marginal stand with immature to overmature components across most species. Dense pole-sapling RM cover has filled in the canopy between the aspen clones and large cull oak & RM. The QA is breaking up; the BTA is holding up better. The best quality cover is in the stand's NE; most of the RP & RO occurs there. Cover is sparser on the SW edge. Most of the JP has died out. The far SE end has smaller diameter and shorter QA & WO poles.
9	4123 - Red Oak	Poletimber Well	8.9	54	51-80	Ownership cards note this stand as originating from a timber trespass (almost at full extent on the 1963 air photos and appearing to extend from a harvest on the adjacent private property). Stump-origin RO from the harvest are vigorous & clean-boled, weeding down to 1-3 stems per clump, with some edging into the saw class. The WO is generally weeded down to 1 stem per clump. Associates include RM & BTA, with scattered mature oak (generally large cull WO), and the stand picks up more pine at the south end.
10	4123 - Red Oak	Sawtimber Poor	20.7	100	1-50	Was shelterwood harvested in 1989 (#083-88), 2"+ DBH except green-marked oak. Was then seed tree harvested in 2009 (#006-08), 2"+ DBH except RP, WP, green-marked oak and retention islands. The residual oak saw (marked seed trees, retention islands, & boundary-excluded peninsulas) is the featured canopy. There is some 27-year old regen (mostly RM) from the shwd but a majority of the regen is 7 years old from the seed tree cut: RM with patches of BTA (more to S & W), and vigorous, competitive oak stump sprouts. There are localized patches of single-stem WO regen at O3 levels (more to NE).
11	4130 - Aspen	Sapling Well	8.7	28	1-50	The three patches were final harvested in 1989 (#083-88), cutting all stems 2"+ DBH. BTA transitioning into the pole class, with RM in the canopy & subcanopy, and a few mature oak mixed into the stand edges.





	Level 4 Cover Type	Size Density	Acres	Stand Age	BA Range	General Comments:
12	4199 - Other Mixed Upland Deciduous	Sapling Medium	45.9	7	Immature	Was thinned in 2000 (#045-98) cutting marked oak down to 70 BA and all merch RM-A. Was then final harvested in 2010 (#004-08), cutting all stems 2"+ DBH except for retention islands with mature oak. There are some RM stump sprouts from the thinning, but most are from the 2010 harvest. The oak stump sprouts are vigorous & competitive with the RM. There is a significant component of single-stem WO (cut a few, 5 years old), in places growing with stem-densities similar to aspen root-suckers. Part of that WO layer couldn't be recorded in the canopy yet (<3 ft tall), but has potential to recruit. The WO is heavier to the S & E, with RM proportion increasing to the west.
13	4199 - Other Mixed Upland Deciduous	Sapling Medium	4.1	17	1-50	Was thinned in 2000 (#045-98) cutting marked oak down to 70 BA and all merch RM-A. Stump-origin regen from the cut includes RM and a minor but competitive oak component. Below the stump sprouts is a layer of single-stem WO. The mature oak is on the perimeter & in an island in the middle, and is part of the retention left for the surrounding harvest.
15	4199 - Other Mixed Upland Deciduous	Sapling Well	19.9	7	Immature	Was final harvested in 2010 (#004-08), cutting 2"+ DBH except for oak >16" DBH and boundary-excluded retention at the south end of the stand. That island was split off as its own stand. The RM-A regen is the featured canopy, with xlog oak residual scattered above. There was only a minor amount of oak regen, but most of those stump sprouts have recruited. Some epicormic branching, wind damage, & mortality in the residual oak saw.
16	4199 - Other Mixed Upland Deciduous	Sawtimber Well	3.0	101	141-170	Was within a forty that was crop tree harvested in 1964 (#91-63), cutting merch A-O-RM except for leaving at least five oak mast trees per acre. The BTA regenerated from the cut, but there was significant RM resid that is now saw-sized (second age estimate), along with scattered xlog oak. A minor amount of oak regenerated from the cut; it is clean-boled & straight. This portion was left as retention when the rest of the original stand was final harvested in 2010 (#004-08).
17	4131 - Aspen, Oak	Poletimber Well	74.9	38	51-80	Was final harvested in 1979 (#050-78A), cutting all merch stems. Residual stems were then removed through a non-commercial FTP in 1980 (W71-65). RO-RM is the dominant cover between BTA clones and occur as associates within clones. The small amount of QA is weeding out. The stump-origin RO is vigorous, clean-boled, and weeding down to 1-4 stems/clump. Trace amounts of RP on the north edge.
18	4123 - Red Oak	Sawtimber Well	14.0	99	111-140	Merch aspen was cut across part of the stand in 1960 (#40-60). Most of the stand was then selection harvested in 1978 (#30-78), cutting merch RM-A and marked-to-cut oak. The two partial harvests, without one-to-one overlap with each other or the stand boundary, resulted in 2-3 age classes within the 0-RM-A. Most of the oak is mature, with only a minor amount regenerated from the harvests. The RO is large & statuesque, with somewhat open-grown form. The RM is mostly suppressed to intermediate pole-sap material from the last cut, with a lesser component of large cull mature RM. The aspen ranges from overmature to immature. The east end has a U-LDT inclusion & old grade crossing through. Possible food plot slop-over on north edge. Illegal quad trail on state from it to camper on private.
19	4130 - Aspen	Sapling Medium	28.2	6	Immature	Was final harvested in 2011 (#002-08), 2"+ DBH except oak. Regenerated to QA & RM with some perimeter BTA. The large-diam mature oak residual is concentrated in the stand's N half.



	Level 4 Cover Type	Size Density	Acres	Stand Age	BA Range	General Comments:
21	4130 - Aspen	Sapling Well	2.2	6	Immature	Was final harvested in 2011 (#002-08), 2"+ DBH except oak. QA with scattered WO poles, hawthorn clumps, BC & serviceberry. Portions of the stand that were sparse pre-harvest did not fill in and were shifted to the adjacent LDT-U stand.
22	4123 - Red Oak	Sawtimber Well	84.5	101	51-80	Merch aspen was harvested in 1961-1962 (#56-61, #96-61, #106-61). Was then thinned in 2000 (#25-98), cutting A-RM 2"+ DBH and marked oak (ave residual of 70 BA). Good quality NRO, but diam gets smaller to the north where the soils transition from the Graycalm-Grayling series to Grayling sands. Oak cored showed good initial response to release, but dropped back down after five years. Species removal opened up the canopy to shelterwood levels in places; more epicormic branching there. Understory dominated by stump-origin RM, with BTA regen concentrated in a few patches. Very little live stump-origin oak from the harvest. Forest Health points were recorded in 2014 along the south wellpad edge and road/pipeline corridors for mortality in the red oak.
23	4131 - Aspen, Oak	Poletimber Well	50.0	39	81-110	Was final harvested in 1978 (#002-78, #007-78, #026-78), merch O-RM-A-Birch. Additional T.S.I. to clean up sub-merch stems was approved. RO-RM is the dominant cover between BTA clones and occur as associates within clones. The small amount of QA is weeding out. The stump-origin RO is vigorous, clean-boled, and weeding down to 2-4 stems/clump. The WP & RP are concentrated in the east; the log-sized material is open-grown. U inclusions in the south half of the stand.
24	4116 - Mixed N. Hardwood - Aspen	Sawtimber Well	4.3	93	51-80	RP & JP were planted in 1938. Merch aspen was cut in 1961 (#56-61). Was also part of a plantation release cut in 1978 (#25-78) removing deciduous competition that was overtopping the RP. Little of the planted pine survived in this stand. The majority cover is mature RM, with large oak, scattered RP, and patches of pole aspen. Mature aspen from the '61 cut are rare. Most of the aspen regenerated from the '78 cut. The lesser amounts of oak & RM from the '78 cut are subcanopy in stature, suppressed by the residual overstory.
25	4310 - Pine, Oak Mix	Sawtimber Well	8.6	79	81-110	RP & JP were planted in 1938. Merch aspen was cut in 1961 (#56-61). Was also part of a plantation release cut in 1978 (#25-78) removing deciduous competition that was overtopping the RP. Trees damaged by a tornado in 1994 were cut in the southeast corner of the stand (#067-94-02). The majority cover is planted RP with mature O-RM, patches of immature BTA from the '78 cut, and traces of saw BTA from the '61 cut. The O-RM from the '78 cut are mostly subcanopy in stature. Informal campsite in the north-center is rimmed with QA and has a patch of autumn olive. The planted JP has largely died out.
26	4130 - Aspen	Poletimber Well	4.8	28	81-110	Was final harvested in 1989 (#22-88), 2"+ DBH. BTA is mainly north of the road and QA south. RM is the dominant cover between clones. Some black canker present in the QA. Mature RP & oak redline trees are on the south edge.
28	42110 - Planted Red Pine	Sawtimber Well	3.6	79	111-140	RP & JP were planted in 1938 around a few naturally established RP & WP. Marked JP were cut by 1963 (#49-62A). These islands were left as retention when the rest of the plantation was final harvested in 2014 (#35-12). The planted JP is continuing to drop out of the canopy.





	Level 4 Cover Type	Size Density	Acres	Stand Age	BA Range	General Comments:
30	42120 - Planted Jack Pine	Poletimber Well	1.5	26	51-80	Was final harvested in 1989 (#22-88), 2"+ DBH. Areas of the harvest with heavy deciduous competition were left to regenerate naturally, and this sparser area was planted to JP in 1991 (C72-245) along with a partial row of RP at the north end. Aspen and BC mix in. The JP is pole-sized by DBH but not product; is all crown.
31	4130 - Aspen	Poletimber Well	20.4	28	51-80	Was final harvested in 1989 (#22-88), 2"+ DBH. Areas of the harvest with heavy deciduous competition (this stand) were left to regenerate naturally, while the sparser areas were planted to RP & JP in 1991 (adjacent stands). Regenerated to QA with small upland brush inclusions. Black canker is common on the clone edges. RM and canopy-level BC are mixed into the clones. The trace of mature RP from a 1938 planting occurs along the stand perimeter. A trace of mature RM-A was left along the west line.
32	42110 - Planted Red Pine	Poletimber Well	11.3	26	111-140	Was final harvested in 1989 (#22-88), 2"+ DBH. Areas of the harvest with heavy deciduous competition were left to regenerate naturally, and this sparser area was planted to RP in 1991 (C72-245) along with randomly-interspersed rows of JP in the northeast. The pipeline corridor that cuts through was left unplanted. The RP is almost all pole-sized, with overall good form and stocking, but the plantation will be challenging to manage long-term due to the planting pattern (JP mixed in and a lot of row-orientation changes).
33	4119 - Mixed Northern Hardwoods	Poletimber Medium	12.9	23	1-50	RP & JP were planted in 1938. Marked JP were cut by 1963 (#49-62A). This portion of the plantation received the heaviest damage from a 1994 tornado. Windthrown and broken trees were cut in 1994 (#067-94-02). The stand's far NW along the road was also within a 2000 harvest (#34-98), but little was removed there. Residual RP saw is concentrated in a pocket in the southeast and widely-scattered elsewhere; open-grown form common. There are some nice oak poles, but the dominant cover is RM, with BC poles. The cover is patchy and averages at the low end of the 50-75% canopy closure category. There is still a fair amount of coarse woody debris from the tornado.
34	42110 - Planted Red Pine	Poletimber Well	34.1	25	81-110	Was final harvested in 1989 (#22-88), 2"+ DBH, roller-chopped in 1991 to reduce deciduous competition, and planted to RP in 1992 (C72-245). RP form good overall where stocking held up, with minor amounts of fork, crook, doubles, porky damage. Small gaps are common where deciduous competition (BC-QA-O) was higher. RP form deteriorates near those gaps. A depression in the stand's north-center had poor RP survivorship. Grading down into that bowl, the RP becomes increasingly stunted and the canopy more open. The sparsest cover there was split out as a non-forested type (low-density tree).
38	4123 - Red Oak	Sawtimber Well	15.2	106	81-110	Was thinned in 2015 (#41-12), orange-marked trees and all white ash and beech. Good quality RO with RP-WP and mixed hardwoods. The basswood and better-quality HM is concentrated in the northeast. Elsewhere, the HM is smaller diam and has poorer form. A few mature BTA were left. Most of the PB are snags. Oak age cut-corrected from stumps. RP cored for age.



Stand	Cover Type	Acres	Managed Site	General Comments:
14	3301 - Low Density Deciduous Tree	8.9	No	Sparse valley stand that picks up denser 0-RM-A cover on its perimeter (left when flanking stands were cut).
20	3301 - Low Density Deciduous Tree	22.3	No	Pole-sized BC cover with impressive hawthorn thickets, traces of apple, scattered JP & open-grown oak, and patches of RM-A-JP cover that was boundary-excluded retention for the 2011 harvest (#002-08). Portions of the harvest that were sparse prior and did not fill in were also picked up within this stand. Wellpad edge of Breit Burn State Beaver Creek F-1 appears to cross into the stand.
27	3302 - Low Density Conifer Trees	86.5		RP & JP were planted in 1938. Marked JP were cut by 1963 (#49-62A). Trees damaged in a 1994 tornado in the stand's NE were salvaged the same year (#67-94-02). The stand was then final harvested in 2014 (#35-12), with retention islands left in the SE. Narrow strips of trees or tall stumps were left along the surface pipelines in this sour gas field. Most of the stand was trenched in 2015 (C72-768) except for small pieces hemmed in by pipelines. The recorded RM regen is almost exclusively north of Tower Hill Truck Trail and was heavily browsed. Most of the the aspen regen is either in those polys or rimming adjacent aspen stands. RP planted in 2016 (C72-768). Variance approved in 2017 to herbicide competing deciduous vegetation.
29	320 - Upland Shrub	3.5	No	Was final harvested in 1989 (#22-88), 2"+ DBH. Areas of the stand with heavy deciduous competition were left to regenerate naturally, and most of the sparser areas were planted to RP or JP 1991 (adjacent stands). This stand was part of the same approved FTP (C72-245), but it was not trenched or planted. Current cover is BC brush & prairie willow with open-grown JP and a few RP-WP-O.
35	3302 - Low Density Conifer Trees	2.6	No	Was final harvested in 1989 (#22-88), 2"+ DBH, roller-chopped in 1991 to reduce deciduous competition, and planted to RP in 1992 (C72-245). This topo depression had poor RP survivorship. Grading down into the bowl, the RP becomes increasingly stunted and sparse, with JP & BC at low densities also. Some recent machete-brushing in the bottom of it.
36	3301 - Low Density Deciduous Tree	45.8	No	RP & JP were planted 1938. Marked JP were cut by 1963 (#49-62A). The plantation's southwest was hit by a 1994 tornado and damaged trees were salvaged the same year (#67-94-02). The RP averaged 75 BA when the stand was final harvested in 2000 (#34-98), 2"+ DBH. A third of the volume removed was RM-A-O. FTP C72-441 was submitted to plant RP. Site prep recon found too much slash and competing deciduous regen. FTP C72-490 was submitted to burn to address those concerns. Surface pipelines were determined to limit the burning option though, so a variance was approved to drop the planting prescription and change the M.O. to U-type. Current cover is a mosaic of U and patches of pole & sapling RM-A-O that regenerated from the various harvests.
37	330 - Low-Density Trees	10.7		The stand had RP-JP planted in 1938, but there was heavy deciduous competition (O-RM). Was final harvested by March 2015 (#41-12), cutting all stems 2"+ except white oak (10 BA cruised residual) and some marked RP-RO along the boundary. The sub-acre portion south of Tower Hill Truck Trail was excluded from the harvest and left as retention. The RM stump-sprout regen was heavily browsed, with only a trace above 3' tall. The large RO that were cut either didn't sprout at all or sprouted feebly and were heavily browsed. Some root-tip and windthrow in the mature residual. The stand was chipped, but processed at the stump first, so there is a near-continuous layer of small-diam slash and large-diam oak butt chunks.
39	110 - Low Intensity Urban	1.4	No	Briet Burn State Beaver Creek A3-16 wellsite. Perimeter grass, knapweed & sweetfern.
40	110 - Low Intensity Urban	3.1	No	Briet Burn State Beaver Creek B2-16 & G-11 wellsites. Bare ground with grass, knapweed & sweetfern on the perimeter.



Stand	Cover Type	Acres	Managed Site	General Comments:
41	110 - Low Intensity Urban	1.4	No	Breit Burn wellsite State Beaver Creek B4-16. Grass, sweetfern, knapweed and BC.
42	122 - Road/Parking Lot	6.6	No	Cleared road and pipeline corridors and associated openings.
43	110 - Low Intensity Urban	1.2	No	Breit Burn wellsite State Beaver Creek G-5. Grass, sweetfern, knapweed and encroaching JP-O.
44	110 - Low Intensity Urban	2.7	No	Breit Burn wellsites State Beaver Creek G-9 & C3-16. Grass, sweetfern, knapweed and encroaching RP-JP.
45	3201 - Sweet Fern	1.6	No	Former wellsite being colonized by sweetfern, some grass, with RP & JP saplings scattered across the opening.
46	110 - Low Intensity Urban	1.0	No	Breit Burn wellsite State Beaver Creek G-1. Grass, sweetfern, knapweed and encroaching JP-BC.
47	110 - Low Intensity Urban	1.3	No	Some above-ground plumping but not a placarded wellsite. Grass, sweetfern, knapweed and encroaching JP.
48	110 - Low Intensity Urban	1.1	No	Breit Burn wellsite State Beaver Creek G2. Bare ground with perimeter grass, sweetfern, knapweed.
49	110 - Low Intensity Urban	1.5	No	Breit Burn wellsite State Beaver Creek G-8. Grass, sweetfern, knapweed and encroaching JP-RP.
50	122 - Road/Parking Lot	4.9	No	Cleared county road and pipeline corridors.
51	110 - Low Intensity Urban	1.5	No	Briet Burn State Beaver Creek F-3 wellsite. Perimeter sweetfern & knapweed.
52	110 - Low Intensity Urban	1.0	No	Briet Burn State Beaver Creek F-2 wellsite. Perimeter sweetfern & knapweed.
53	110 - Low Intensity Urban	1.4	No	Briet Burn State Beaver Creek A1-16 wellsite. Perimeter grass, knapweed & sweetfern.
54	110 - Low Intensity Urban	1.7	No	Briet Burn State Beaver Creek A3-17 wellsite. Perimeter grass, knapweed & sweetfern.
55	110 - Low Intensity Urban	0.9	No	Breit Burn State Beaver Creek wellsite A-8, with perimeter grass, knapweed, sweetfern & encroaching RM-A.
56	110 - Low Intensity Urban	0.9	No	Breit Burn State Beaver Creek wellsite A-6, with perimeter grass, sweetfern, knapweed & encroaching JP.





Stand	Cover Type	Acres	Managed Site	General Comments:
57	110 - Low Intensity Urban	1.7	No	Breit Burn State Beaver Creek wellsite A-20, with perimeter grass, knapweed, sweetfern & encroaching JP.
58	110 - Low Intensity Urban	1.0	No	Briet Burn State Beaver Creek A-1 wellsite. Perimeter grass, sweetfern, knapweed & encroaching JP.
59	110 - Low Intensity Urban	0.9	No	Briet Burn State Beaver Creek A-4 wellsite. Perimeter grass, sweetfern & encroaching oak, JP.
60	110 - Low Intensity Urban	2.0	No	Briet Burn State Beaver Creek A-15 wellsite. Perimeter grass, knapweed, sweetfern & encroaching JP-RP.
61	110 - Low Intensity Urban	1.2	No	Breit Burn State Beaver Creek wellsite A-19, with perimeter grass, knapweed & encroaching JP.
62	110 - Low Intensity Urban	0.9	No	Breit Burn State Beaver Creek wellsite A-2, with perimeter grass, knapweed, sweetfern & encroaching JP.
63	110 - Low Intensity Urban	0.9	No	Breit Burn State Beaver Creek wellsite A-7, with perimeter grass, knapweed, sweetfern & encroaching JP-O.
64	110 - Low Intensity Urban	1.3	No	Breit Burn State Beaver Creek wellsite A-17, with perimeter grass, knapweed, sweetfern & encroaching JP.
65	110 - Low Intensity Urban	1.0	No	Breit Burn State Beaver Creek wellsite A-3, with perimeter grass, knapweed, sweetfern & encroaching JP.
66	122 - Road/Parking Lot	1.7	No	Cleared county road and utilities corridor.
67	3301 - Low Density Deciduous Tree	5.4	No	Was originally part of stand 27, final harvested in 2014 (#35-12). Narrow strips of trees or tall stumps were left along the surface pipelines in this sour gas field. This portion of stand 27 was not trenched in 2015 (C72-768) because it was hemmed in by pipelines.