

# Pre-Operations Report

**Operation Name:** Mackey Creek

**County:** Marion

**Management Basin:** Scattered

**Table 1. Operation Areas, Types and Acres**

Area	Type of Operation	Gross Acres	Net Acres
I	PC-M	68	60
II	RC	41	38
<b>Total</b>		<b>109</b>	<b>98</b>

## **I. PHYSICAL DESCRIPTION OF OPERATION AREA:**

The operation is located within a temperate climate area. Typically the fall and winter seasons are wet. This area receives approximately 70 to 90 inches of rainfall per year. The operation is located within the *Tsuga heterophylla* Zone (*Natural Vegetation of Oregon and Washington, Franklin & Dyrness, 1973*).

The landforms are moderate to very steep side-slopes on both sides of the Mackey Creek canyon in approximately the middle of the stream length. The underlying rocks are sedimentary & igneous origin mapped as “Undifferentiated tuffaceous sedimentary rocks.”

The soil approximately 300 feet on either side of the existing road through the middle of the operation is classified as a gravelly and sandy loam. This is a well drained soil with rapid permeability in the surface soil. The site index is 140 feet for Douglas-fir at 100 years old. The surface erosion potential is classified as moderate. The soil for the rest of the operation is classified as a gravelly and clay loam. The soil is well drained with rapid permeability in the surface soil. The site index for Douglas-fir at 100 years old is 110 feet. The surface erosion potential is classified as severe. The elevation for the operation ranges from 1,700 to 3,000 feet. The slopes within the operation range from 5 to 100%.

## **II. CURRENT STAND CONDITION:**

This operation is adjacent to an area that is being developed for residential use to the west and southwest. The rest of the operation is adjacent to USFS lands.

(see attached map) A portion of this operation also supports the municipal water intake for the City of Detroit.

This operation was first proposed during the FY 2007 Annual Operation Plan. The district received several comments for this operation during the public review period for the 2007 plan. As a result, the district decided to postpone this operation until the FY 2008 AOP in order to address concerns brought up during the review. These concerns pertained to water quality, potential debris flows, potential windthrow, use of the Guy Moore road and noise restrictions. Water quality will be addressed in this report under Section VII. Aquatic Resources; debris flows will be addressed under Section IX. Slope Stability; windthrow will be addressed under Section III. Desired Stand Condition; Guy Moore road will be addressed under Section VI. Transportation Planning; and noise will be addressed under Section XIII. Other Resource Considerations.

The operation is made up of a 68 year-old stand (12392) and a 52 year-old stand (12391). Area I is currently classified as Understory. The majority of the overstory consists of Douglas-fir with small amounts of western hemlock, western red cedar and big leaf maple scattered throughout. Due to a difference in site conditions, the trees on the lower slopes are larger than the trees on the upper slope. The trees on the upper slopes are smaller, more dense and are growing more slowly. The understory consists of dwarf Oregon grape, salal and vine maple. There are very few snags per acre within the stand. There is an average of 350 cubic feet of sound down wood per acre; and 1,900 cubic feet of down wood per acre in all decay classes. (SLI, 2005)

Area II is currently classified as Understory. The overstory contains a mixture of Douglas-fir, western hemlock and a small amount of western red cedar. The majority of these trees have a high height to diameter ratio and small tree crowns. There are existing scattered old growth trees located in the eastern portion of this stand. The understory consists of dwarf Oregon grape, vine maple and ferns. There is an average of 9 snags per acre; 760 cubic feet per acre of sound down wood; and 4,080 cubic feet per acre of down wood in all decay classes. (SLI, 2005)

**Table 2. Stand Inventory Information**

Area	Prescription	Stand ID <sup>1</sup>	Species	Age	DBH	BA	TPA	SDI	Acres <sup>2</sup>
I	PC-M	12392	DFWH	68	14	211	211	57	68
		<b>Target <sup>3</sup></b>			<b>16</b>	<b>143</b>	<b>103</b>	<b>35</b>	
II	RC	12391	DF	52	13	204	217	56	41
		<b>Target <sup>3</sup></b>			<b>22</b>	<b>47</b>	<b>17</b>	<b>10</b>	

1 The source of stand inventory information is SLI from 2005 for trees 8 inches DBH and greater.

2 The acres are based on GIS and include roads, streams buffers, reserve areas, etc.

3 The Target identifies expected stand characteristics (DBH, BA, TPA and SDI) after harvesting has been completed.

### **III. DESIRED STAND CONDITION:**

This operation is located in the Scattered Basin. This basin is a diverse mixture of ownership, stand ages, species mixtures, and site quality. As indicated by its name, the Scattered Basin is a conglomeration of scattered ODF ownership parcels that range in size from 40 acres to 1000 acres. The operation is located within a parcel which is approximately 160 acres in size. Most of the smaller parcels within the basin are viewed as land exchange candidates due to the intermingled nature of the ownership. The Mackey Creek operation is on the land exchange candidate list.

The desired future condition for Areas I and II is Older Forest Structure. (*Cascade District Implementation Plan, 2003*) This is driven largely by the location of the property (next to the City of Detroit), and an easement granted to the City of Detroit for a municipal water system. The water system utilizes Mackey Creek, an in stream reservoir, a water line, and a treatment plant, all located on State Forest property.

The potential for windthrow within the operation was brought up as a concern during the FY 2007 AOP review process. The state forest staff Silviculturist reviewed the operation in May 2006 to evaluate windthrow potential and thinning feasibility. The Silviculturist determined that Area I exhibits characteristics that indicate better resistance to windthrow: good diameter growth in relation to heights and the dominant trees have full crowns. The stand in Area I is growing well and should continue to grow well after thinning. The trees in the western portion of Area I are adjacent to a 10 year old clearcut. There was no excessive windthrow along this edge outside of the steep draws.

The vision for Area I is for large Douglas-fir, western hemlock and western red cedar trees in the overstory with an understory of smaller western hemlock and western red cedar. There would also be patches of smaller mixed species stands scattered across the area. These patches would be the result of thinning the smaller, dense trees within Area I. After thinning these smaller trees within the patches may take a very long time, if ever, to reach a layered condition. These patches will provide horizontal diversity across the landscape.

The dominate and co-dominate trees within Area II do not appear to be growing as well as those in Area I. There are wind thrown trees throughout Area II with the heaviest amounts located in the very steep areas adjacent to Mackey Creek. Thinning Area II was evaluated but dismissed because of increased windthrow potential, poor height-to-diameter ratio, and poor live crown ratios in the stand. The vision for Area II is to use a retention harvest that would provide a multiple storied stand in approximately 15 to 20 years. Leaving approximately 15 to 20 of the largest trees per acre in both clumps and individual trees scattered throughout the area will provide the large tree component necessary for OFS in

the future. Area II will be replanted with a mixture of Douglas-fir and noble fir trees.

The **Anticipated Pathway for the Area I** begins with:

- A moderate thinning as a first entry commercial thinning is designed to open the stand canopy and encourage the understory to respond. Both brush species and tree species should respond to the thinning.
- Additional thinning may not be an option for this stand due to the low site quality. The stands will be evaluated at a later date to see how they are progressing toward the desired future condition.

The **Anticipated Pathway for the Area II** begins with:

- A retention harvest leaving 15 to 20 trees per acre.
- The plantable areas will be reforested with a mixture of Douglas-fir and noble fir seedlings.
- These areas will be evaluated in approximately 10 years to see if the younger trees within the stand are in need of a pre-commercial thinning.

**Table 3. Stand Structure Information**

Area	Stand ID	Current	Post Harvest <sup>1</sup>	Desired Future	Acres
I	12392	UDS	UDS	OFS	68
II	12391	UDS	REG	OFS	41

<sup>1</sup> The stand is expected to develop into this condition in the five to ten years after this operation is completed.

#### **IV. PROPOSED MANAGEMENT PRESCRIPTION:**

The **proposed management prescription for Area I** is:

- All trees greater than 8 inches DBH thin to: basal area of 143; 103 TPA; ave. DBH 16 inches; and a SDI 35%. The dominant trees with the best crowns will be retained within the stand. These trees usually have the lowest height to diameter ratio.
- Reserve all hardwoods, western red cedar and western hemlocks from cutting. These trees will count towards meeting the target SDI above.
- All old growth trees will be reserved from harvest, however, they will not count towards meeting the residual SDI target.
- Slash loads along the western and south-western borders will be treated. All slash within 200 feet of these property lines may be hauled away, piled in small piles and burned, or chipped. The method for disposal will be finalized during the contract writing. This work is being done to reduce the fuels loading along lands adjacent to residential areas.
- Maintain existing snags which do not pose a safety hazard and down wood.

- Snags and down wood will not be added at this entry because the tree size limits the utility and duration of the structural benefit.
- The **Total Residual Stand (overstory and understory) for Area I will be:** basal area of 143; 173 TPA; ave. DBH 9 inches; and an SDI 36%.

The **proposed management prescription for Area II** is:

- Perform a retention cut leaving 15 - 20 trees per acre of the largest diameter in both clumps and as scattered individual trees across the area. These should be the trees with the lowest height to diameter ratio within the stand.
- All old growth trees are reserved from harvest.
- Harvest all trees not needed to meet the leave trees described above.
- Planting spots may be created if needed to aid in reforesting the area.
- Reforest the area with a mixture of Douglas-fir and noble fir seedlings.
- Maintain existing snags which do not pose a safety hazard and all existing down wood.
- At the end of the operation, at least 2 snags per acre will remain within Area II.

**V. ESTIMATED TIMBER AND REVENUE INFORMATION:**

**Table 4. Timber and Revenue**

Ownership		Sale Type	
BOF	CSL	Cash	Recovery
100%	0%	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Planned Quarter:		2	

	Conifer	Hardwood	Total
Net Volume (MBF)	1,317	0	1,317
Stumpage Value (\$/MBF)	\$200		
Estimated Gross Value	\$263,400	0	\$263,400
		Project Costs:	\$5,000
		Estimated Net Value:	\$258,400

**VI. TRANSPORTATION PLANNING AND HARVESTING:**

Access to the sale area is somewhat restrictive due to the fact that the only road into the unit also goes through Detroit Lake’s residential development. Guy Moore Avenue has a thin lift of asphalt over a questionably weak sub grade. The road has restrictive load limits, the use of Jake brakes is prohibited, there are people in the area that walk on this steep, narrow twisty road that create a safety problem for log trucks. The City could possibly require ODF to re-surface the

road with new asphalt if it was used during the operation. After discussions with officials of the City of Detroit it was determined the Guy Moore Avenue was not practical for ODF to use as a haul route. Several routes were reconned for access from federal ownership to State Forest Land and none were deemed feasible. Since there is little access available for the unit, the harvesting of this sale will be accomplished with helicopters. Helicopter landings have been identified on the USFS ground to the southeast of the sale about ½ mile away off the Hansen Creek road system. The USFS will be contacted and arrangements will be made to use existing helicopter landings on their property. Minor road improvements to USFS road will be necessary to haul on their road.

Project work for the sale

- Brushing and grading/shaping on .75 miles of road

**Table 5. Transportation Planning Summary (Miles).**

Activity	Mainline	Collector	Rocked Spur	Dirt Spur
Construct	0	0	0	0
Improve	0	0	0	.75
Maintain	0	0	0	0
Close/Block	0	0	0	0
Vacate	0	0	0	0

For determination of road class either use results of the Harvest and Habitat roads classifications, or if this information is not available then low use roads are spurs, medium use roads are collectors and high use roads are mainlines. Use these same criteria when comparing the total for all AOP sales to the IP plans.

**VII. AQUATIC RESOURCES AND WATER QUALITY:**

There are no listed fish within the streams in the operation. There is 1 small perennial non-fish bearing stream and 4 small, non-fish bearing streams located within the operation. The overstory along these streams consists of Douglas-fir. The minimal understory along these streams consists of vine maple and dwarf Oregon grape. These streams will be looked at further during sale layout to determine if all 4 draws do indeed run water during the winter.

The transportation and harvest systems have been developed to provide additional protection measures and ensure protection of an important domestic use for the City of Detroit. The water intake for the City of Detroit is located within the perennial non-fish stream Mackey Creek. The pipe from the intake runs along the draw for approximately 1,000 feet before it connects with the water treatment facility which is also located on State Forest property. The pipe is alternately under ground or above ground.

All of the infrastructure associated with the water intake will be protected during the operation with wide no-harvest boundaries and harvest practices that direct tree falling away from the infrastructure. Protection measures include at least 150 foot no harvest buffers along the stream above the intake and directional felling away from the stream and pipe, and full suspension of logs while yarding by helicopter.

Management activities within riparian areas of the remaining streams will focus on achieving properly functioning aquatic and riparian habitat conditions over time. Riparian Management Areas (RMAs) will be established immediately adjacent to streams for the purpose of protecting aquatic and riparian resources and maintaining the functions and ecological processes of the streams. The basic strategies have been adapted to address water quality concerns of the City of Detroit.

- Along the entire length of Mackey Creek in Area II, a no harvest buffer will be posted at the slope break or 150 feet from the stream whichever is greater.
- Along Mackey Creek in Area I above the domestic water intake, a no harvest buffer will be posted at the slope break or 150 feet from the stream whichever is greater. Below the intake, a no harvest buffer will be placed upslope from the water line pipe enough distance away to protect the line during tree felling and to avoid any unstable slope areas. From the edge of this no harvest buffer out to 170 feet from the stream, the trees will be thinned to a SDI 35%.
- Along the remaining 4 small, non-fish bearing streams, a 25 foot no harvest buffer will be posted. The remaining RMA area will be thinned to a SDI 35%.

Water quality will be protected with the use of full suspension helicopter logging and wide no harvest buffers. Full suspension helicopter yarding minimizes soil disturbance by lifting the log off the ground and flying it over the unit. Soil compaction that might otherwise occur with other yarding systems is avoided as well. Therefore, we have selected a harvest system that will minimize harvest-related erosion and sediment delivery to Mackey Creek. This is intended to prevent harvest-related increases in turbidity and suspended sediment that are expressed concerns of the City of Detroit.

Surface erosion from the unit is unlikely due to an anticipated lack of overland flow. This is in part because management plans encourage growth of the shrubs and trees in the understory (Area I) or leave residual trees combined with early reforestation activities (Area II). Both conditions result in rapid revegetation which reduces potential for surface erosion. These vegetation conditions combined with soils that have high infiltration rates further minimize the potential for overland flow from the two areas. Without overland flow surface erosion is extremely unlikely.

The 150 foot no cut buffers provide a wide margin of safety to prevent harvest-related disturbance in the near stream area that might otherwise cause erosion. Buffers are also important for providing other functions such as maintaining stream temperature and aquatic habitat. Along other small non-fish bearing streams in the unit, 25 foot no-cut buffers combined with adjacent thinning out to 170 feet will also prevent disturbance in the near stream areas that might otherwise be susceptible to erosion and sediment delivery to these very small tributaries to Mackey Creek. The same water quality protections associated with helicopter logging as described above will apply in these area as well.

The prevailing scientific evidence suggests that forest management as is planned for this sale will not reduce winter or summer stream flows. Harvest-generated slash that inadvertently enters streams will be removed.

The combination of riparian, aquatic, and upland forest management plans is designed to protect the City of Detroit water source and system as well as other aquatic and riparian resources.

#### **VIII. T&E SPECIES CONSIDERATIONS:**

This operation was surveyed for Northern Spotted owls during the 2005 survey season with two responses from a nearby owl site. (the operation is not located within any owl sites) The operation was surveyed in 2006 with no responses. The operation will be surveyed again during the 2007 survey season.

The operation area was checked against District knowledge for any listed plant location. The operation area was also checked against the Oregon Natural Heritage Program's database of known listed plant locations. No listed plant records were identified within the operation area.

#### **IX. SLOPE STABILITY AND GEOTECHNICAL ISSUES:**

There are bands of steep slopes with scattered very steep slopes throughout the sale area. The initial hazard and risk assessment from the geotechnical specialist is high. As a result, the geotechnical specialist was consulted and a field visit was done. Upon field examination of the Southwest boundary the geotechnical specialist noted that although there are structures adjacent; none of the current structures were determined to be within channels that would provide a path for a debris flow in accordance with ODF Forest Practices Act Technical Note #2.

#### **X. RECREATION RESOURCES:**

There are no developed recreational activities located within the operation.

**XI. CULTURAL RESOURCES:**

Pre-operation reconnaissance revealed no visible cultural resource features or artifacts. If discovery is made, the cultural resource will be protected and field staff will consult with the Cultural Resource Specialist in Salem.

**XII. SCENIC RESOURCES:**

This operation is adjacent to residential areas and can be seen from Highway 22, the City of Detroit and also from Detroit Lake. The thinning portion on this operation will have little visual impact. The visual impact of the retention cut will be broken up by clumps of large trees and scattered individual trees throughout Area II. With the use of helicopters for logging, there should be no visible corridors within the unit.

**XIII. OTHER RESOURCE CONSIDERATIONS:**

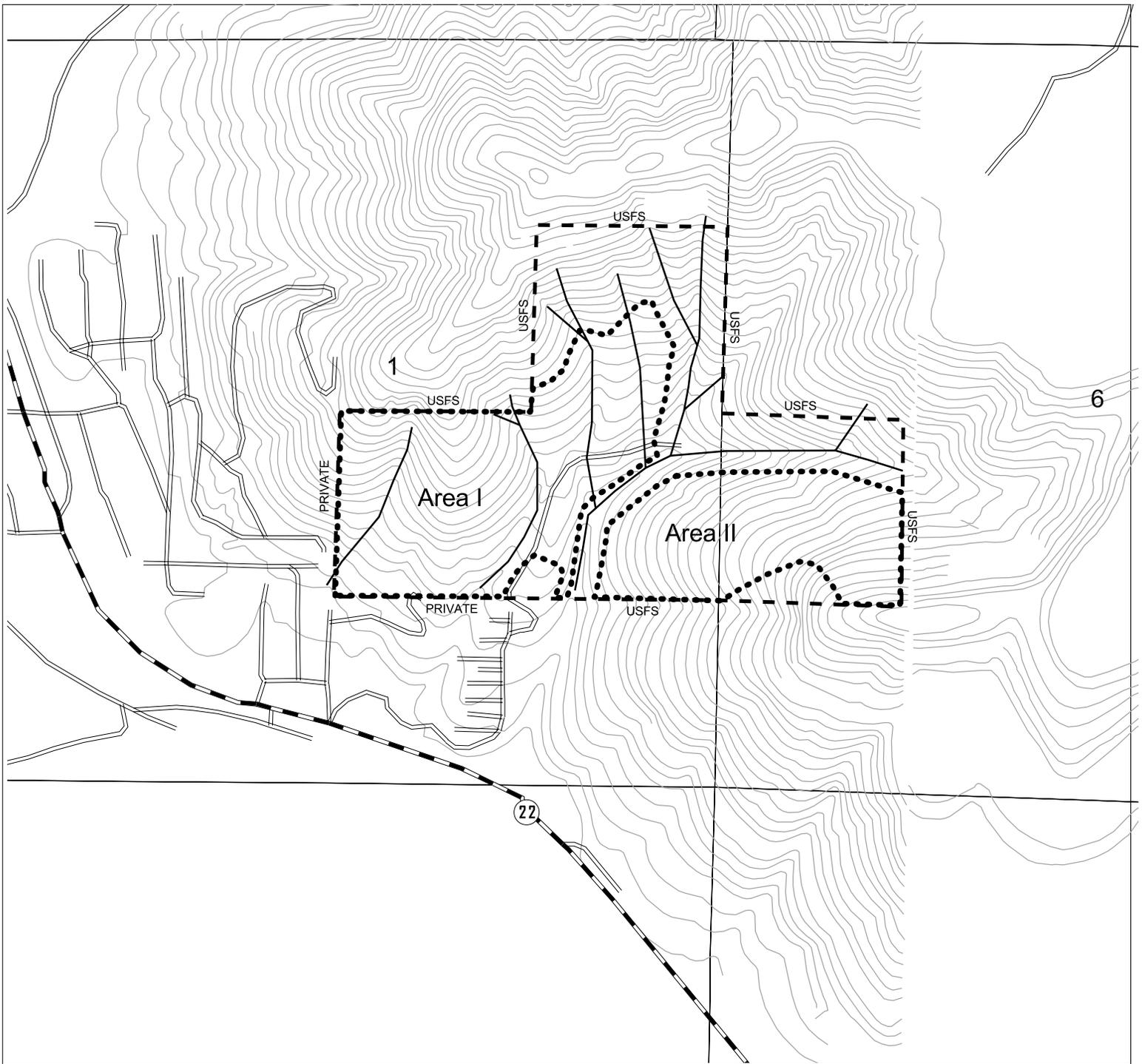
The City of Detroit has an ordinance (29) that restricts noise within the city limits. This ordinance will be reviewed prior to the writing of the timber sale contract and provisions to comply with the ordinance will be made.

**XIV. LMCS:**

Areas I and II contain Focused Stewardship, Aquatic and Riparian Habitat for two perennial Type N stream. See Section VII, Aquatic Resources and Water Quality, for the management guidelines to be utilized.

Area II contains Special Stewardship, Domestic Water Use. See Section VII, Aquatic Resources and Water Quality, for the management guidelines to be utilized.

Areas I and II contain Focused Stewardship, Visual areas. See Section XII. Scenic Resources for the management guidelines to be utilized.



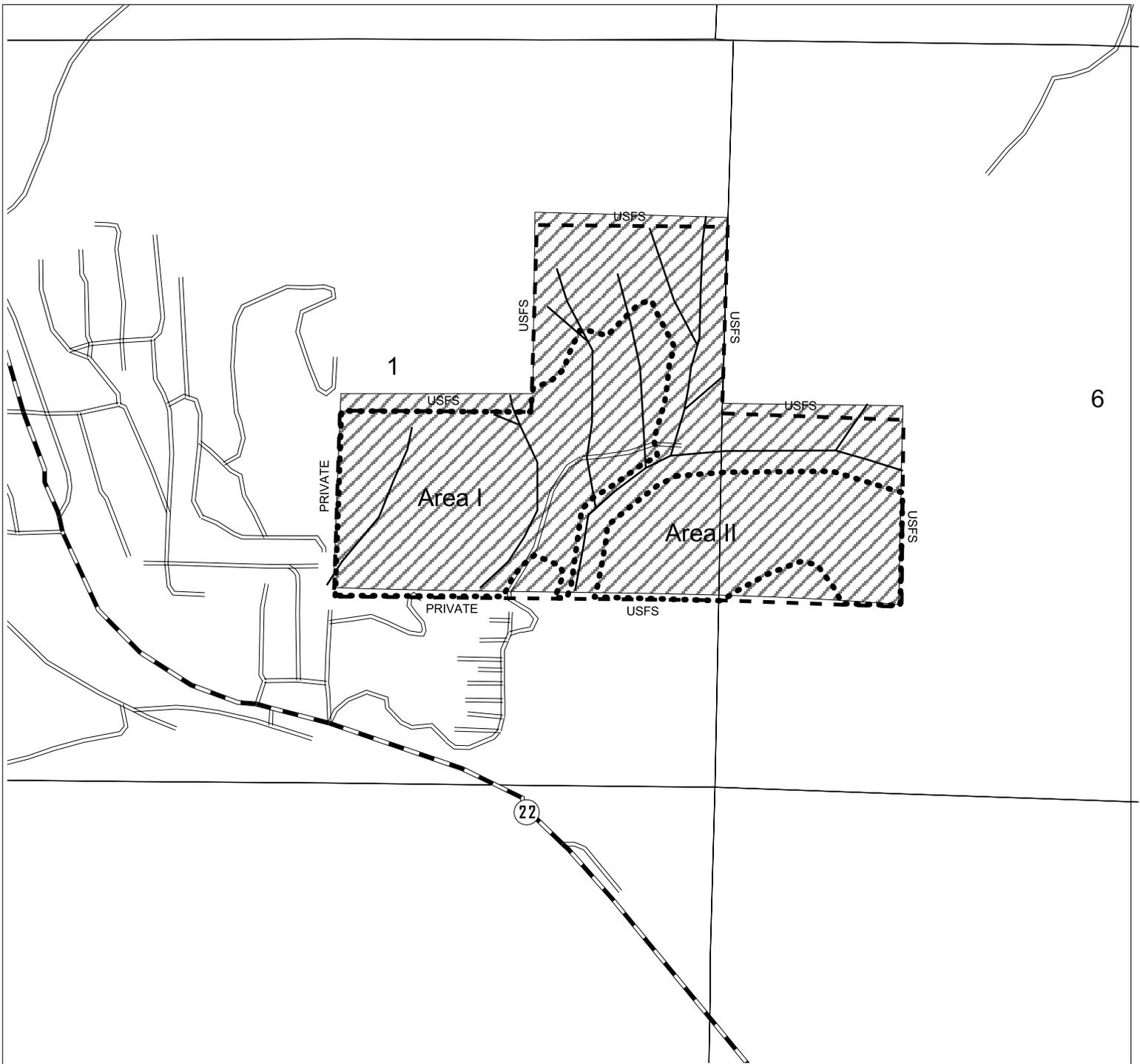
**MACKEY CREEK**  
**--TOPOGRAPHY--**  
**FY '08 SALE PLAN**  
**NORTH CASCADE DISTRICT**  
 Portions of Section 1, T10S, R5E, and  
 Section 6, T10S, R6E, W.M.  
 Marion County, OR

Approximate Net Acreage:  
 PC-M 60  
 RC 38

- Santiam State Forest
- Mackey Creek
- Roads
- Streams
- 40 foot contour lines



This product is for informational use and  
 may not have been prepared for, or be suitable  
 for legal, engineering, or surveying purposes.



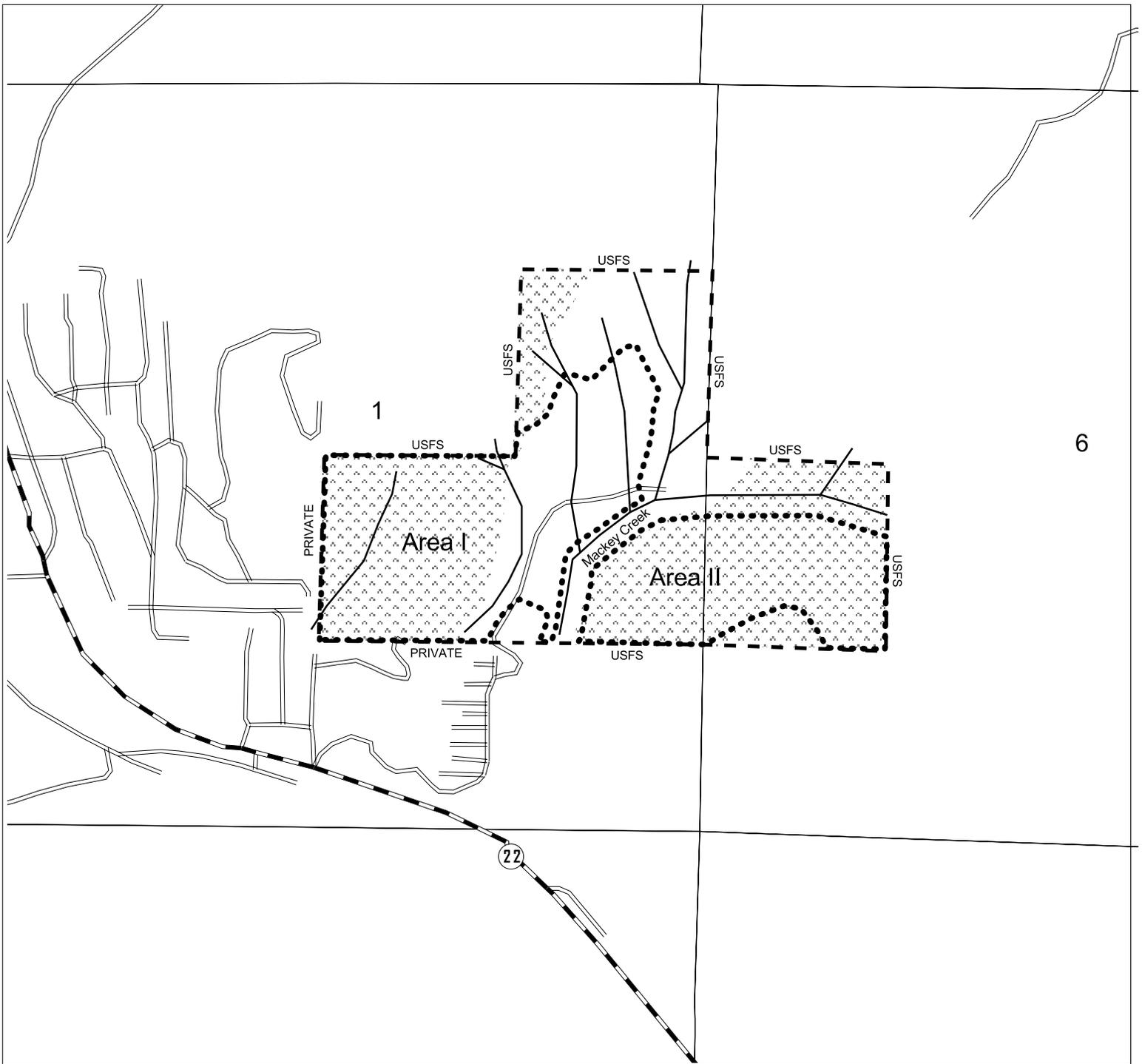
**MACKEY CREEK**  
**--DESIRED FUTURE CONDITION--**  
**FY '08 SALE PLAN**  
**NORTH CASCADE DISTRICT**  
 Portions of Section 1, T10S, R5E, and  
 Section 6, T10S, R6E, W.M.  
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Approximate Net Acreage:  
 PC-M 60  
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-  Santiam State Forest
-  Mackey Creek
-  Roads
-  Streams
- Desired Future Condition
-  LYR
-  OFS



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**MACKEY CREEK  
--KEY RESOURCES--  
FY '08 SALE PLAN  
NORTH CASCADE DISTRICT**

Portions of Section 1, T10S, R5E, and  
Section 6, T10S, R6E, W.M.  
Marion County, OR

Approximate Net Acreage:  
PC-M 60  
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-  Santiam State Forest
-  Mackey Creek
-  Roads
-  Streams
-  Visual Area

500 0 500 1000 Feet



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