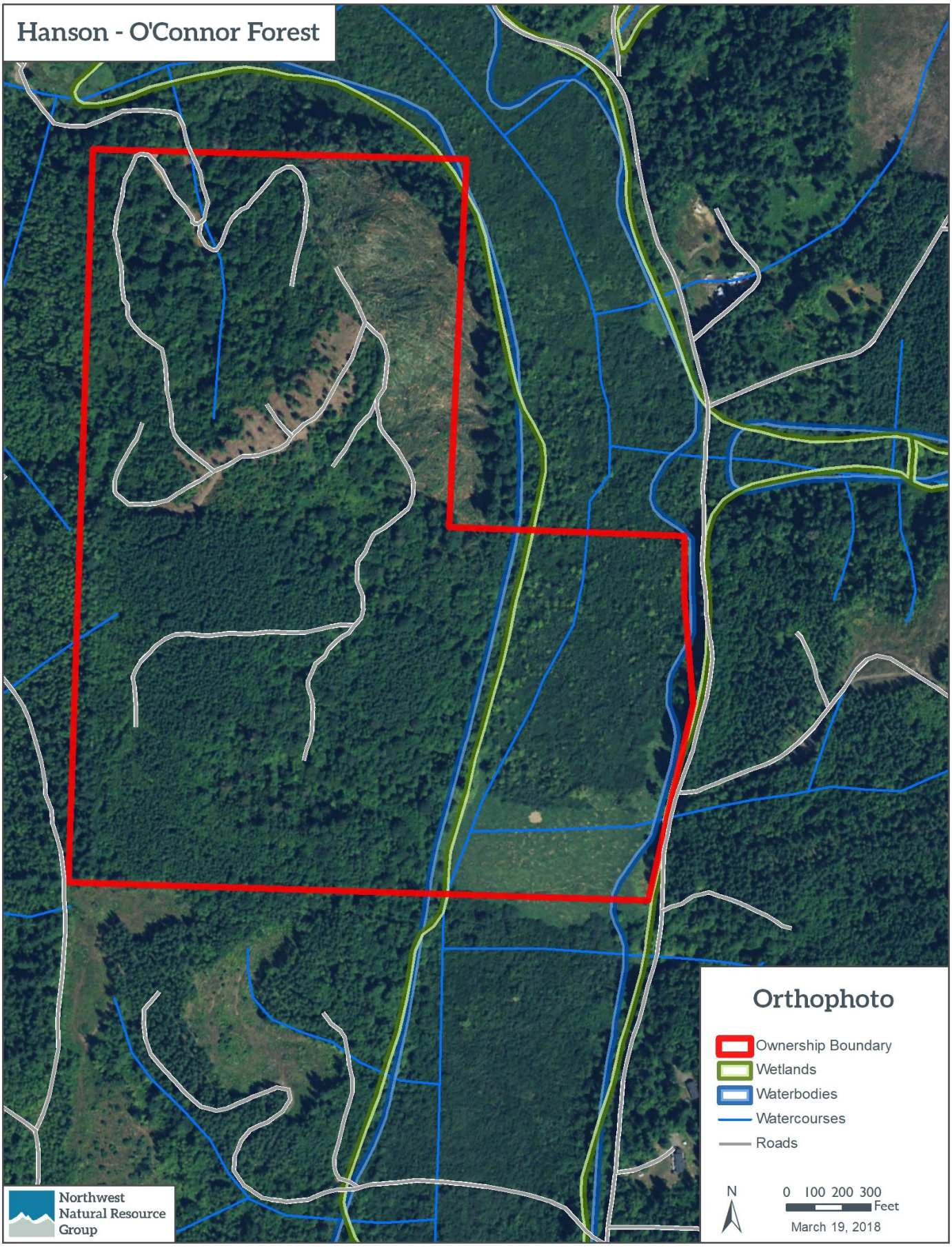
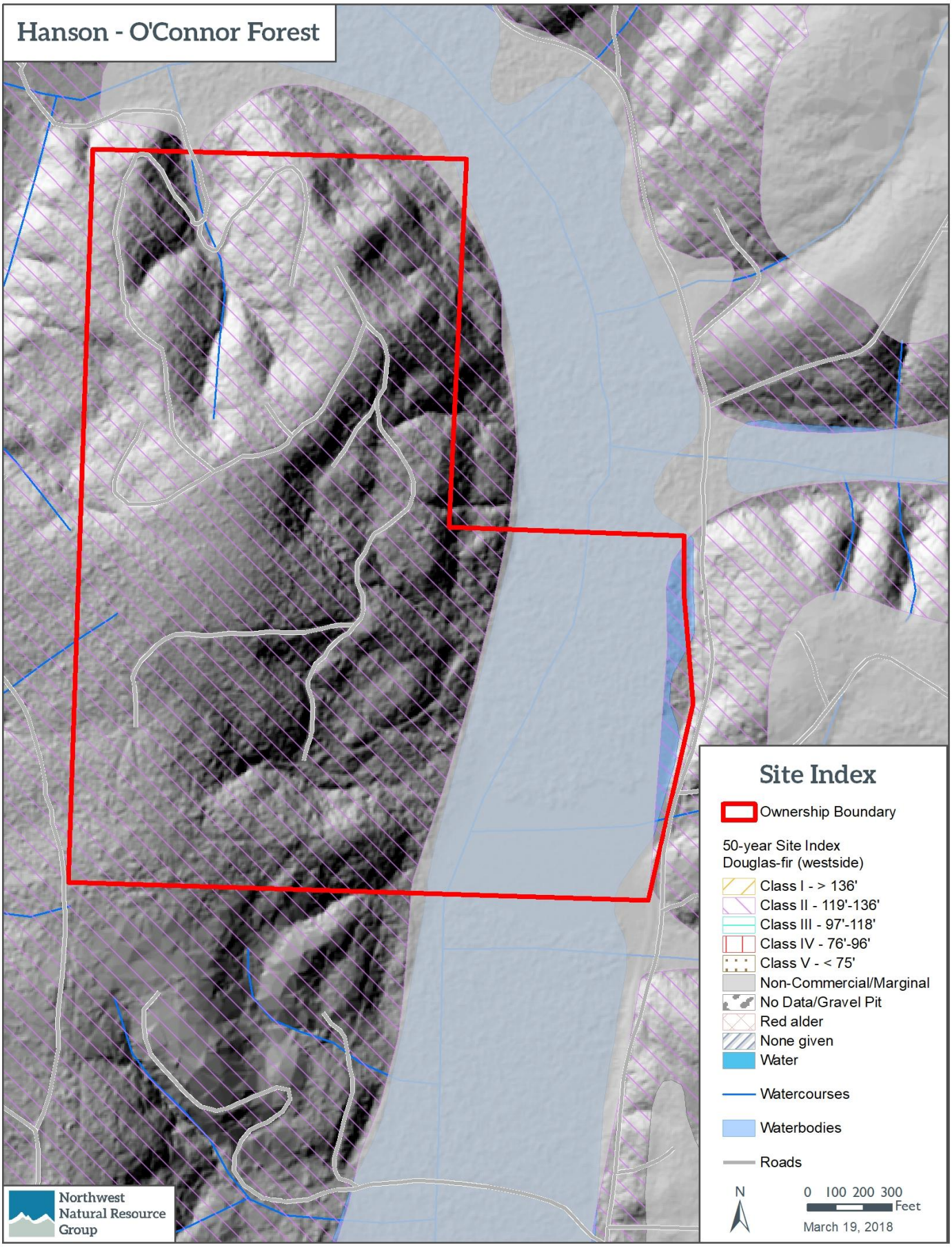
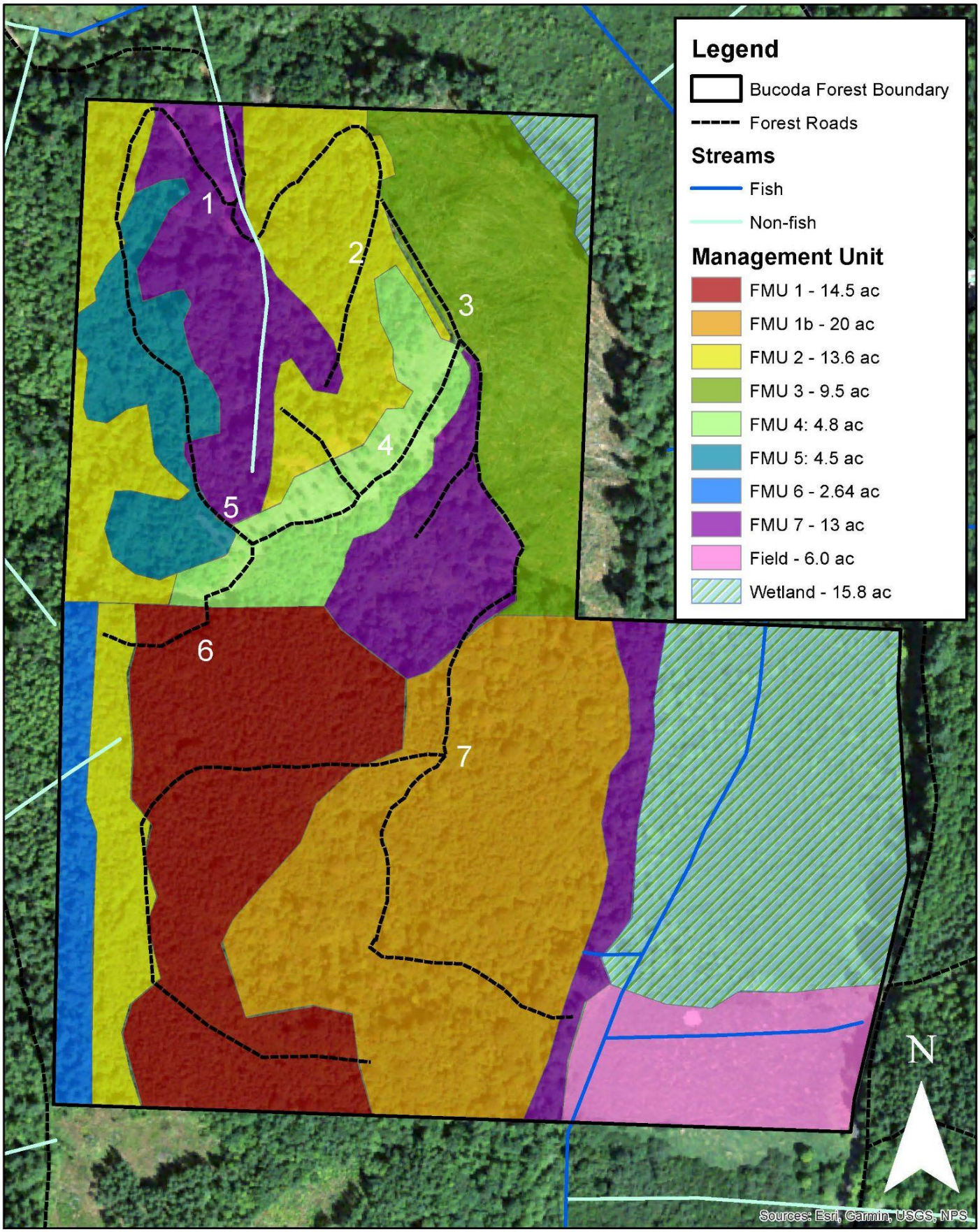

Hanson - O'Connor Forest
Orthophoto
Ownership Boundary
Wetlands
Waterbodies
Watercourses
Roads
N
0 100 200 300
Feet
March 19, 2018
Northwest
Natural Resource
Group


Hanson - O'Connor Forest
Site Index
Ownership Boundary
50-year Site Index
Douglas-fir (westside)
Class I - > 136'
Class II - 119'-136'
Class III - 97'-118'
Class IV - 76'-96'
Class V - < 75'
Non-Commercial/Marginal
No Data/Gravel Pit
Red alder
None given
Water
Watercourses
Waterbodies
Roads
N
0 100 200 300
Feet
March 19, 2018
Northwest
Natural Resource
Group



NORTHWEST NATURAL RESOURCE GROUP
LEADERS IN ECOLOGICAL FORESTRY

Miles
0 0.0375 0.075 0.15

Forest Management Units

FMU	Acres	Stand Type	Age
1	14.5	Douglas-fir	30
1b	20	Douglas-fir/Red Alder	30
2	13.6	Mixed hardwood	22
3	9.5	Douglas-fir	9
4	4.8	Douglas-fir/Cedar	3-9
5	4.5	Douglas-fir/Cedar	3
6	2.64	Mixed hardwood/conifer	45
7	13	Mixed hardwood/conifer	3-20
Field	6	Canary reed grass	NA
Wetland	16.8	Mixed native shrubs	NA

Management Plan Timetable

Year	Management Practice or Activity	FMU	# of acres	NRCS Practice Code	Comments
2019 - 2024	Identify and mark property lines and corners in the field				
2018 - 2024	Reopen overgrown forest access roads	All			
2018 - 2019	Seedling release	4	4.8	315	Cut back competing vegetation from around tree seedlings. Install cages on cedar.
2019 – 2024	Install 15” culverts where roads cross stream channels	1b			Three culverts 15” diameter x 20’ long.
2019 - 2024	Pre-commercially thin	2	13.6	666	The dense hardwoods to 200 – 250 TPA (13’ – 15’).
2019 - 2024	Pre-commercially thin	1b	20	666	Pre-commercially thin alder and Douglas-fir to 240 – 300 TPA.
2019 - 2024	Site prep and plant mixed conifers beneath hardwoods	1b	20	E612B	Prepare planting sites by cutting back competing vegetation and replant with mixed conifers at 150 TPA.
2019 – 2024	Create snags and build wildlife habitat piles and habitat logs	1b	20	649	Create 2 snags/acre, 1 downed log/acre, and 1 habitat pile/5 acres.
2019 – 2024	Stand release	3	9.5	666	Cut back coppicing maples to release Douglas-fir.
2019 - 2024	Site preparation and planting	5	4.5	490 612	Prepare sites for planting by cutting competing vegetation. Plant with Douglas-fir and western red cedar at 350 TPA. Cage cedar.
2019 - 2024	Site prep and plant mixed conifers beneath hardwoods	7	13	490 612	Masticate dense brush and blackberry, thin poor quality alder and maple coppice, then replant with mixed conifers at 200 TPA.
2019 - 2029	Maintain planted tree seedlings	1b, 5, 7	17.5		Cut back and/or spray competing vegetation around tree seedlings until they reach a free-to-grow height of 2-3’ above surrounding vegetation. Straighten and lift tree cages to protect terminal leader of seedlings.

2020 - 2025	Commercially thin from below	1	14.5		Commercially thin from below to approx. 150 TPA. Underplant with cedar at 100 TPA.
2029 - 2034	Pre-commercially thin	3, 4, 5	18.8		PCT 250 - 350 TPA by retaining the most dominant, vigorous, and highest quality trees of each species.
2030 - 2035	Commercial thin from below	2	13.6		Commercially thin alder to approx. 150 TPA. Underplant with cedar at 100 TPA.
2035 - 2040	Commercial variable density thin	1, 1b	34.5		Commercial variable density thin FMU 1 to approx. 100 TPA. Commercially thin FMU 1b from below to 150 TPA. Underplant with Douglas-fir and cedar.
2045 - 2050	Commercial variable density thin.	2	13.6		Commercially thin alder to 100 TPA. Underplant with Douglas-fir and cedar.
2050 - 2055	Commercial variable density thin	1, 1b	34.5		Commercially thin FMU 1 to approx. 80 TPA. Commercially thin FMU 1b to approx. 100 TPA. Underplant with mixed conifers.
2050 - 2055	Commercially thin from below	4, 5, 7	22.3		Once average diameters reach 10” – 12” DBH, this unit should be commercially thinned by removing 30 – 40% of the trees reducing stocking density to 150 – 220 TPA.
2060 - 2065	Final commercial harvest of alder	2	13.6		Commercially harvest remaining alder with the exception of up to 50 TPA as legacy trees. Replant as necessary to ensure optimal stocking.
2065 - 2070	Commercial variable density thin	1, 1b	34.5		Commercial variable density thin FMU 1 to approx. 75 TPA. Commercial variable density thin FMU 1b to approx. 70 TPA.

5 Year Financial Summary

Item	Description	Expense	Revenue
Land purchase: $220,000			
Memberships & Dues	Membership in NNRG & NWOA	$750	
Insurance	Liability insurance through NWOA	$1,125	
Annual property taxes	Two parcels in DFL, one parcel in Undeveloped Land	$3,544	
Forest management plan	Forest management plan	$2,880	
Tree planting	Site preparation, seedlings, materials, labor, seedling maintenance	$57,914	
Pre-commercial thinning and stand release	Pre-commercial thinning conifer and hardwood stands	$10,880	
Cascara Sales			$268
EQIP Payments			$52,041
CSP Payments			$39,175
Tools & equipment		$15,000	
Road maintenance	Mowing, culverts, grading	$5,000	
Legal & Professional	LLC formation, bookkeeping	$6,000	
		$103,093	**$91,484**

Project #1 (FMU 7)

2019 - 2020 Restoring Conifers to Degraded Hardwood Stand

Total acres	Age	Dominant spp.	TPA	Average DBH	Avg. height	Avg. crown ratio
13	18 - 20	Red alder Big leaf maple	<50	6”	52’	>40%

Prescription

Reference: USDA Stand Density Guide, pg 3

Site preparation

Mechanically masticate understory vegetation with flail mower. Retain “islands” of native shrubs. Cut defective overstory trees.

Planting

Plant western red cedar, western hemlock, and Douglas-fir at 300 TPA. Douglas-fir planted in canopy gaps. Tree protectors on cedar. Bamboo stake with orange flagging with each tree.

Seedling Maintenance

Manually cut back competing vegetation within 3’ of tree seedling. Lift cages to protect leaders of cedar.

Costs & EQIP Funding (Reference: EQIP & CSP, pg 1)								
Year	**Practice**	**Description**	**Acres**	**Cost/ Acre**	**EQIP $$ /Acre**	**Total Cost**	**EQIP Payment**	**Cost/ Income**
2019	Mechanical Site Prep (490)	Masticate understory brush with flail mower	13.0	$1,160	$955	$15,080	$12,415	($2,665)
2020	Tree Planting (612)	Planted WH, RC, DF @ 200 TPA	13.0	$508	$830	$6,604	$10,790	+ $4,186
2020	Herbaceous Weed Treatment (315)	Cut back competing vegetation from around tree seedlings	13.0	$150	$65	$1,950	$845	($1,105)
2021	Herbaceous Weed Treatment (315)	Cut back competing vegetation from around tree seedlings	13.0	$203	$65	$1,950	$845	($1,105)
2022	Herbaceous Weed Treatment (315)	Cut back competing vegetation from around tree seedlings	13.0	$203	$65	$2,639	$845	($1,794)
						$28,223	**$25,740**	**($2,483)**

Project #2 (FMU 2)
2020 Pre-commercial Thin Hardwood Stand

Total acres	Age	Dominant spp.	Trees per acre	Average DBH	Avg. height	Avg. crown ratio
13.6	~20	Red alder Big leaf maple	785	8”	52’ - 60’	35% - 40%

Prescription
References: USDA Stand Density Guide, pg 3. Red alder relative density chart, pg 4. Red alder site index curve, pg 5. Red alder cubic foot volume per acre, pg 6.

Thin from below to 200 – 250 TPA (13’ – 15’). Remove suppressed and storm damaged trees, then thin for spacing and crown placement in canopy. Thin big leaf maple coppice to 2-3 high quality stems (e.g. straight and no branching for at least 24’) where possible, or cut back entirely where no high quality stems are present. Retain no more than 20 maple per acre (50’ x 50’). Any conifers in the understory should be released by thinning more heavily along their southern side.

Costs & EQIP Funding								
Year	**Practice**	**Description**	**Acres**	**Cost/Acre**	**EQIP $$ /Acre**	**Total Cost**	**EQIP Payment**	**Cost/ Income**
2020	Forest Stand Improvement (666)	PCT hardwood stand	13.6	$0*	$309	$0*	$4,202	+ $4,202

* Labor: approximately 6-8 hours/acre

Project #3 (FMU 3)
2020 Stand release from bigleaf maple

Total acres	Age	Dominant spp.	Trees per acre	Average DBH	Avg. height	Avg. crown ratio
9.5	6	Douglas fir	350	1”	2’ – 4’	100%

Prescription
Cut all bigleaf maple coppice to release Douglas-fir.

Costs & EQIP Funding								
Year	**Practice**	**Description**	**Acres**	**Cost/Acre**	**EQIP $$ /Acre**	**Total Cost**	**EQIP Payment**	**Cost/ Income**
2020	Forest Stand Improvement (666)	Cut bigleaf maple to release DF.	9.4	$150	$309	$2,040	$2,904	+ $864

Project #4 (FMU 4)
2020 Seedling Release

Total acres	Age	Dominant spp.	Trees per acre	Average DBH	Avg. height	Avg. crown ratio
4.8	4-7	Douglas fir Red cedar	350	<1”	12” – 16”	100%

Prescription

1. Mechanically cut all competing vegetation in unit with brushcutter[1]
2. Manually cut competing vegetation within 3’ radius circle of seedling[2]
3. Manually cut competing vegetation to release leader[3]

Costs & EQIP Funding								
Year	**Practice**	**Description**	**Acres**	**Cost/Acre**	**EQIP $$ /Acre**	**Total Cost**	**EQIP Payment**	**Cost/ Income**
2020	Forest Stand Improvement (666)	Seedling release	4.8	$0	$309	$0	$1,483	+ $1,483

[1] 8 hours/acre
[2] 8 hours/acre
[3] 7 hours/acre

Project #5
2020 Cascara Harvest

Harvested lbs	Price/lb	Total Value
5,362	$0.05	$268

Project #6 (FMU 1)
2022 - 2023 Commercial Thinning

Total acres	Age	Dominant spp.	Trees per acre	Average DBH	Avg. height	Avg. crown ratio	Basal Area	MBF/ Acre	Tons/ Acre
14.5	30	Douglas-fir Red Alder	295	10”	74’	40%	138	15	105
		Snags	37	7”	NA	NA	16		
		Post Harvest	149	12”	84’		83	11	77

Prescription

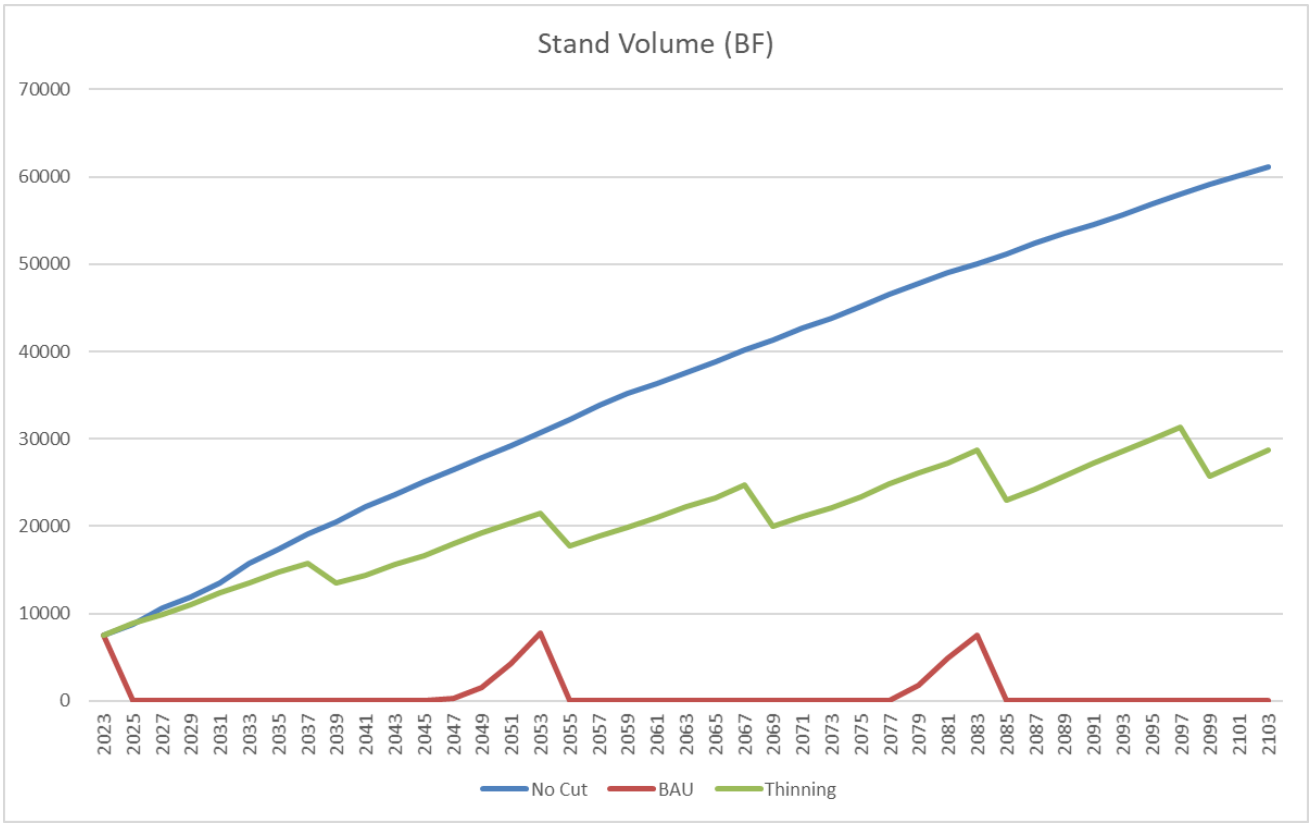
References: USDA Stand Density Guide, pg 3. Douglas-fir site index curve, pg 7. Douglas-fir cubic foot volume per acre, pg 8.

Thin from below to 150 TPA (D + 5 or 17’), removing approx. 50% of the trees (30% of volume). Remove suppressed and defective trees, then thin for optimal crown placement in the canopy. Retain hardwoods, other conifer species, and some snags and defective trees for habitat. Thin again when ~15” (D + 2) to 100 TPA. Thin again when ~18” (D+2) to 80 TPA. Thin again when ~20” (D+3) to 75 TPA.

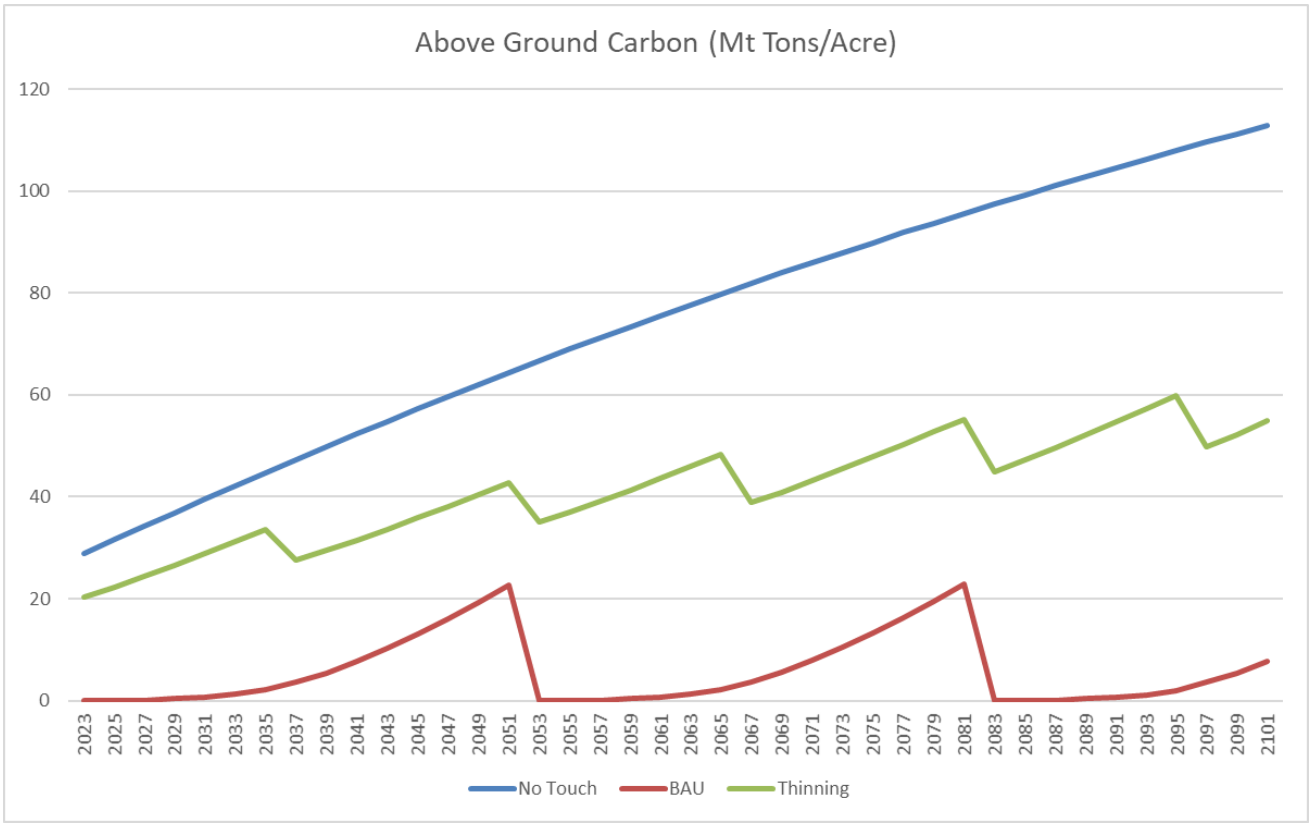
Harvest Summary (2022)	Harvest Summary (2023)*
Pre-harvest: 15 MBF/Acre (220 MBF total) Harvest volume: 5.0 MBF/acre (72.5 MBF total) Saw-log: 3.5 MBF/acre (51 MBF total) 24.5 tons/acre (355 tons total) Pulp: 1.5 MBF/acre 10.5 tons/acre (152 tons total)	Pre-harvest: 15.6 MBF/Acre (226 MBF total) Harvest volume: 5.5 MBF/acre (80 MBF total) Saw-log: 4.0 MBF/acre (58 MBF total) 28 tons/acre (406 tons total) Pulp: 1.5 MBF/acre 10.5 tons/acre (152 tons total)
2022 Log prices Saw-log (Sierra Pacific): $80/ton x 355 tons: $28,400 Pulp (DaPaul): $47/ton x 152 tons: $7,000 o FSC premium: $4/ton: $600 <u>Gross revenue: $36,000</u> **Logging costs** Logging: $45/ton x 406 tons: $18,300 Hauling: $10/ton x 406 tons: $4,060 Consultant/permitting: $1,000 Roads: $1,000 Total Costs: $24,360 <u>Net revenue: $11,640</u>	**2023 Log prices** Saw-log (Sierra Pacific): $70/ton x 406 tons: $28,420 Pulp (DaPaul): $28/ton x 152 tons = $4,256 o FSC premium: $4/ton: $600 <u>Gross revenue: $33,276</u> **Logging costs*** Logging: $50/ton x 406 tons: $20,300 Hauling: $12/ton x 406 tons: $4,872 Consultant/permitting: $1,000 Roads: $1,000 Total Costs: $27,172 <u>Net revenue: $6,104</u>

* Assumes 4% annual timber volume growth and 10% increase in logging/hauling costs.

MBF Growth Scenarios



Carbon Dynamics Scenarios



Project #7 (FMU 1b)
2023 Pre-commercial thinning, underplanting, wildlife habitat structures

Total acres	Age	Dominant spp.	Trees per acre	Average DBH	Avg. height	Avg. crown ratio
20	30	Red Alder Douglas-fir	350 - 450	8” – 10”	65’	35%

Prescription

Pre-commercially thin RA & DF

Thin both alder and Douglas-fir from below to 240 – 300 TPA. Remove suppressed and defective trees first, then thin for canopy spacing.

Underplanting

To increase diversity and improve long-term carbon sequestration and timber production, underplant with mixed conifers at 150 TPA. Species included: western red cedar, western hemlock, Sitka spruce, grand fir, Douglas-fir, and white pine. Shade tolerant trees are planted under hardwoods. Douglas-fir and white pine are planted into gaps. All trees have bamboo stakes and orange ribbon. Cedar trees have tree protectors.

Wildlife habitat structures

1. Create 32 snags, 20 downed logs, and four habitat piles.

Year	Practice	Description	Acres	Cost/Acre	EQIP/CSP $$/Acre	Total Cost	EQIP/CSP Payment	Cost/ Income
2022		CSP Conservation Payment						+ $1,000
2023	Forest Stand Improvement (666)	Pre-commercial thinning	20	$442	$341	$8,840	$6,864	($1,976)
2023	Planting for high C sequestration (E612B)	Trees, materials, and labor	20	$785	$1,711	$15,691	$34,222	+ $18,531
2023	Structures for wildlife (649)	Wildlife habitat piles (4)	20	$0	$295 each	$0	$1,180	+ $1,180
2023	Structures for wildlife (649)	Snags (32)	20	$0	$24.5 each	$0	$982	+ $982

2023	Structures for wildlife (649)	Downed logs (20)	20	$0	$246 each	$0	$4,928	+ $4,928
2023		Cut back competing vegetation from around tree seedlings	20	$200	NA	$4,000	NA	($4,000)
2023		Spray around seedlings	20	$150	NA	$3,000	NA	($3,000)
2023		CSP Conservation Payment						+ $1,000
2024		Seedling maintenance	20	$150	NA	$3,000	NA	($3,000)
2024		CSP Conservation Payment						+ $1,000
2025		Seedling maintenance	20	$150	NA	$3,000	NA	($3,000)
2025		CSP Conservation Payment						+ $1,000
2025		Seedling maintenance	20	$150	NA	$3,000	NA	($3,000)
2026		CSP Conservation Payment						+ $1,000
								+ $11,645