WDFW

Forest Restoration Accomplishments

Forest Management on Wildlife Areas

There are about 200,000 acres of forest on the Washington Department of Fish Wildlife's (WDFW) Wildlife Areas. To maintain these forests as high quality, resilient wildlife habitat, WDFW must actively manage areas that have been degraded by prolonged wildfire suppression or by previous landowners.

According to the 20-Year Forest Health Strategic Plan 27% of eastern Washington forests need to be treated to restore resiliency. WDFW-owned forests, however, tend to be at lower elevations where forests are often most-degraded, and treatments are disproportionally required. Thus, WDFW is striving to treat about 30% of its forests by 2037 to restore the ratios of open and dense forests that existed historically.

Since 2015 WDFW has thinned about 8.5% of its forests. After one or sometimes two thinnings, wet forests typically require no management. Thinning alone, however, is not enough to fully restore fire-dependent, dry forests which constitute about 80% of WDFW's forests. Prescribed burning is also required to remove excess fuels and promote fire-resilient species in dry forests. Thus, since 2015 WDFW has also applied prescribed fire to 2.7% of its forests. Going forward, these forests will require periodic prescribed fires, or thinning if prescribed fire isn't feasible, to compensate for fire suppression to keep communities safe.

Since 2015 WDFW has completed 23,130 acres of forest health treatments on 28 wildlife area units throughout Washington. This area is equal to a 1,200-mile-long football field. Treatment totals by category are as follows:

- 8,961 acres pre-commercial thinning
- 7,929 acres of commercial thinning with slash pile burning
- 5,367 acres of prescribed burning
- 418 acres of planting after wildfires
- 184 acres of stand-alone slash pile burning on new acquisitions

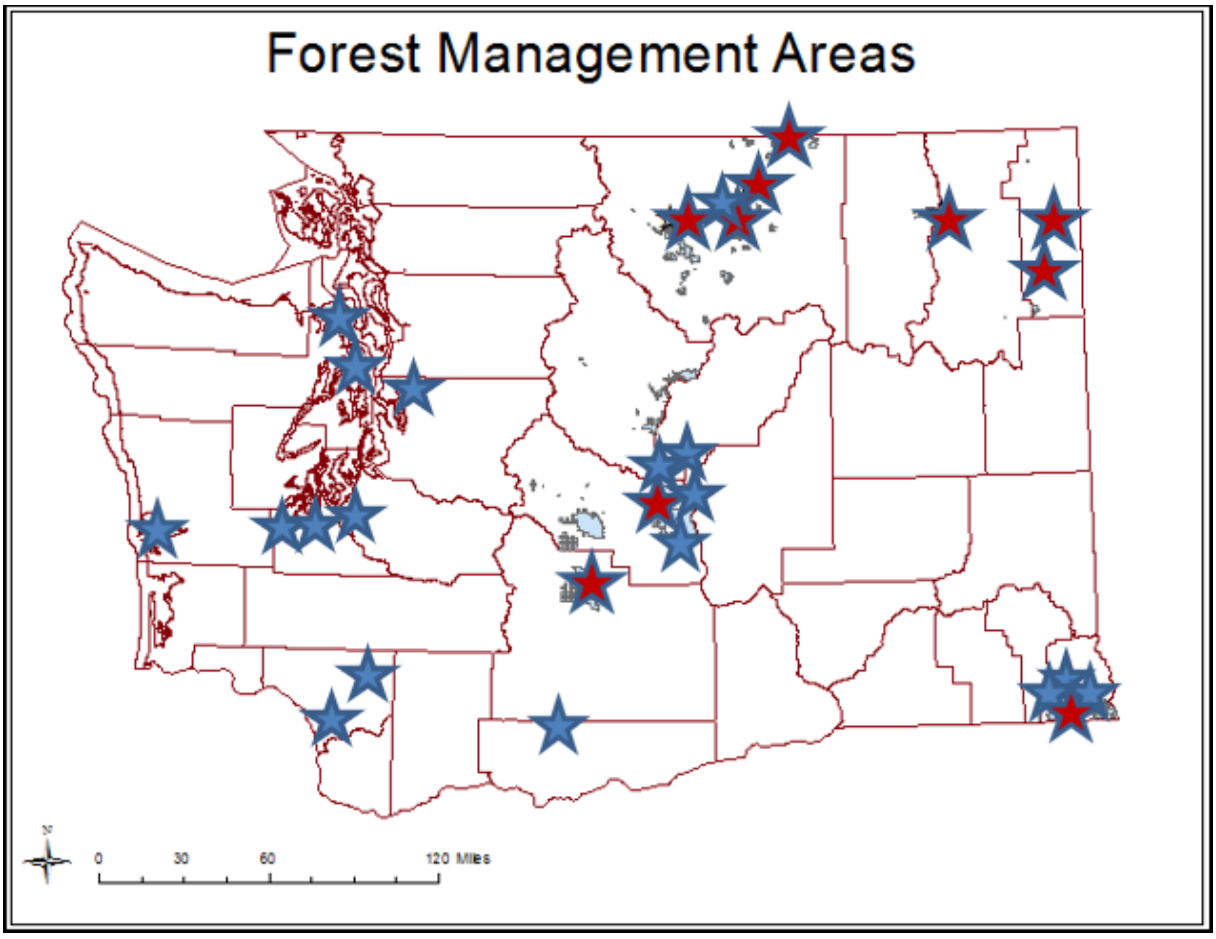
Projects have removed 248,541 tons of excess fuels from treated areas. Excess fuels were removed in the following ways:

- 83% hauled to mills
- 14% burned in prescribed fires
- 3% burned slash piles

Projects have also provided more than 5,000 logs for stream restoration projects

While these accomplishments are substantial, uncharacteristically large, and intense megafires have burned 32,000 acres of WDFW forests since 2015. While fires are sometimes restorative, fires often kill far more trees than they historically did because degraded forests have too much fuel on the ground and too many small trees that allow fires to climb up into the tops of large trees that might otherwise survive. Therefore, modern-era wildfires often further degrade forests and make it seem like forest managers are trying to climb a down escalator.

These is, however, reason for hope. Several projects that were completed in advance of wildfires have helped reduced the spread of wildfires and reduce their impacts on wildlife habitat. As we gradually restore forests to resemble their historic conditions with mosaics of both open and dense forest, it should become easier to avoid destructive megafires.



Region 1
4-O Ranch
Grouse Flats
LeClerc
Rustlers Gulch
Sherman Creek
Weatherly
Wooten

Region 2
Burch Mountain
Buzzard Lake
Chesaw
Methow
Pogue Mountain
Sinlahekin
Swakane

Region 3
Colockum
L.T. Murray
Merril Lake
Oak Creek
Wenas
Yakima River
Rock Creek

Region 5
Davis Creek
Klickitat
St. Helens

Region 6
Elk River
Morgan Marsh
Scatter Creek
Tarboo
West Rocky
Prairie

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Region 5

Region 6

4-O Ranch Wildlife Area Unit (Asotin County)

Problem: Overstocked forests in historically open mixed conifer and ponderosa pine savannah. The dense conditions were leading to high insect mortality and elevated wildfire risk.

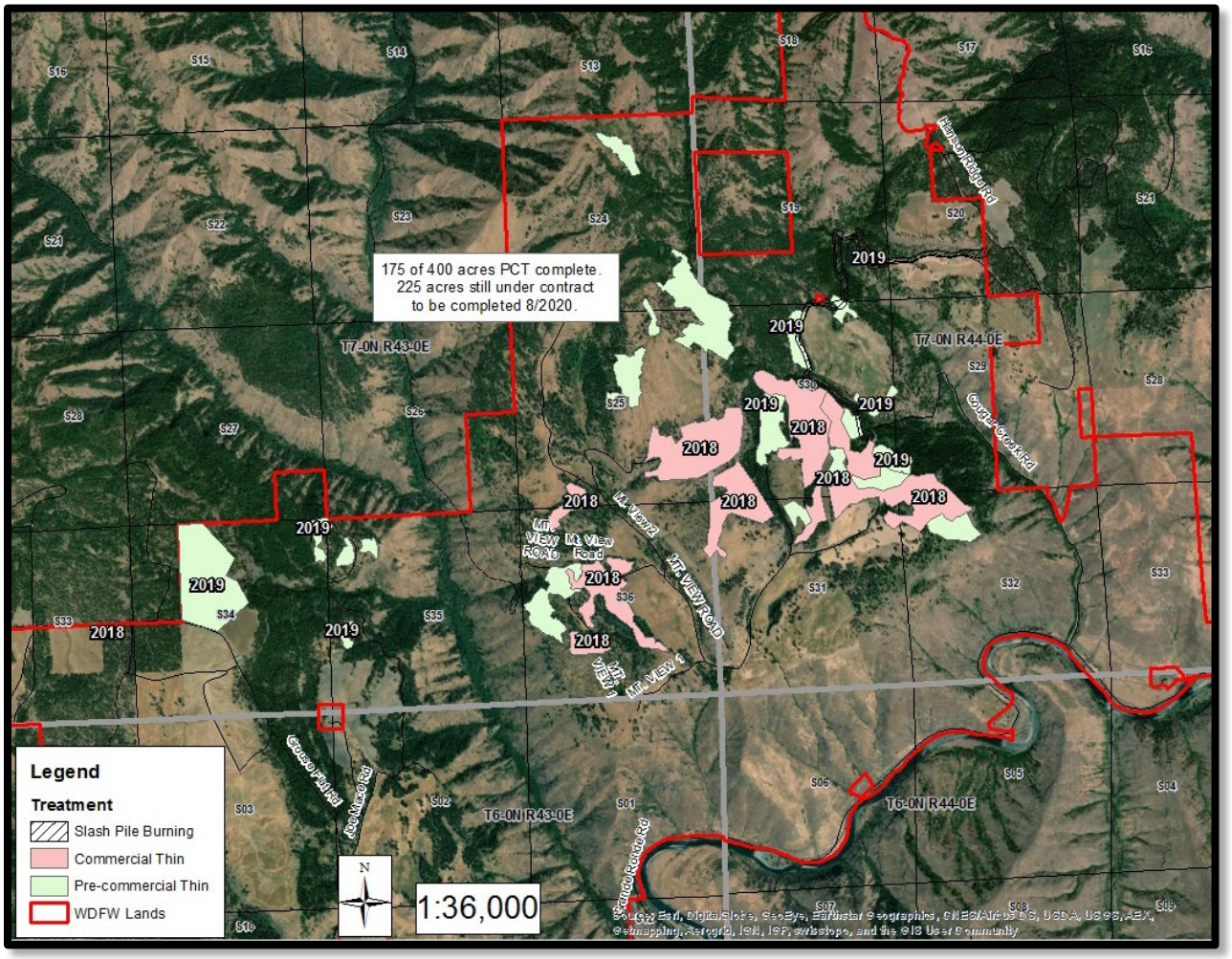
Recent Work: 2018-2020

- 315 acres commercially thinned.
- 403 acres non-commercially thinned (Supported with Capital Funds, timber sale revenue & RMEF grant)

Goals accomplished: Increased growing space for dominant trees and increase forage for deer and elk. Reduced fuel along roadways. Collected seed to reforest adjacent wildlife area. Protected infrastructure.

Estimate of excess biomass removed from commercially thinned forests: 15,833 tons (50.5 tons/acre)

- Sawlogs and pulp wood delivered to mills – 15,833 tons (500 truckloads)
- 65 tons of slash piles burned



2018
Before commercial thinning

2018
After commercial thinning

2019
Before non-commercial thinning

2019
After non-commercial thinning

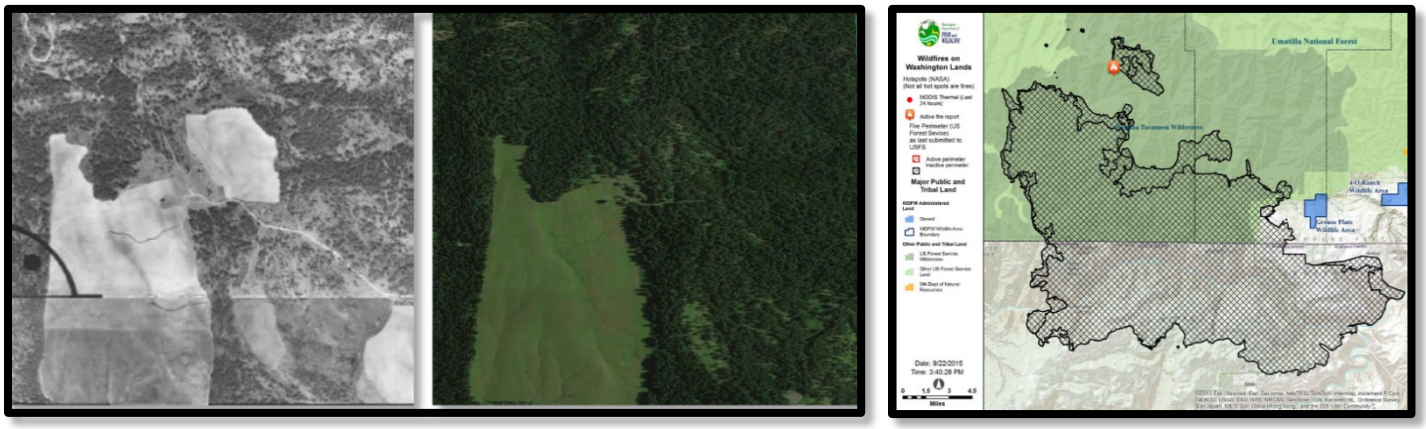
Long Term Strategy:

- Thin remaining forests where necessary.
- Maintain thinned areas to the degree possible with prescribed fire or future thinning projects.
- Maintain dense, mature forests where appropriate to provide habitat for species (Great grey owls, etc.) that rely on dense forests.

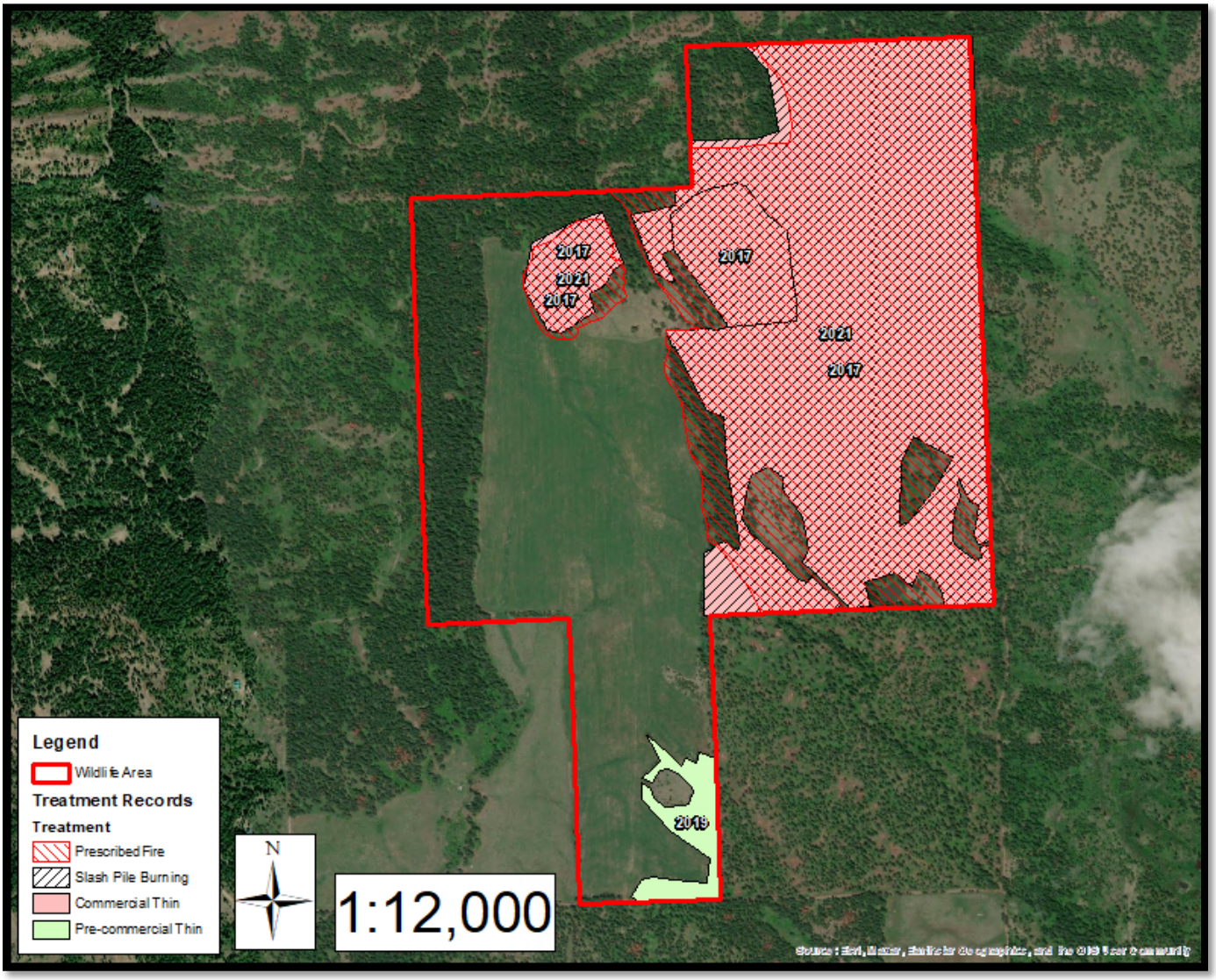
Grouse Flats WLA (Garfield County)

Problem: Overstocked forests in historically open mixed conifer and ponderosa pine savannah. Compare 1971 and 2014 aerial photographs. The dense conditions were leading to high insect mortality and elevated wildfire risk. Forests nearly burned in the 82,658-acre Grizzly Wildfire of 2015.

1971 Forest condition | 2014 Forest condition | 2015 Wildfire map



Recent work: 300 acres commercially thinned in 2017 with slash burned in piles (Harvested wood covered costs).



Recent work:

- 2021: 330 acres of prescribed burning
- 2019: Pre-commercially thinned 20 acres
- 2018: Commercially thinned 285 acres

Goals accomplished: Reduced fuel loads and removed fuel ladders, increased growing space for dominant trees, decreased dwarf mistletoe in western larch and Douglas-fir. Increased forage for deer and elk.

Estimate of excess biomass removed: 24,001 tons (Average 72 tons/acre)

- Sawlogs and pulp wood delivered to mills - 15,800 tons (572 truckloads)
- Prescribe burning – 6,270 tons
- Slash pile burning - 931 tons

2017
Before commercial thinning

2018
After commercial thinning

2017
Fall pile burning

Long Term Strategy:

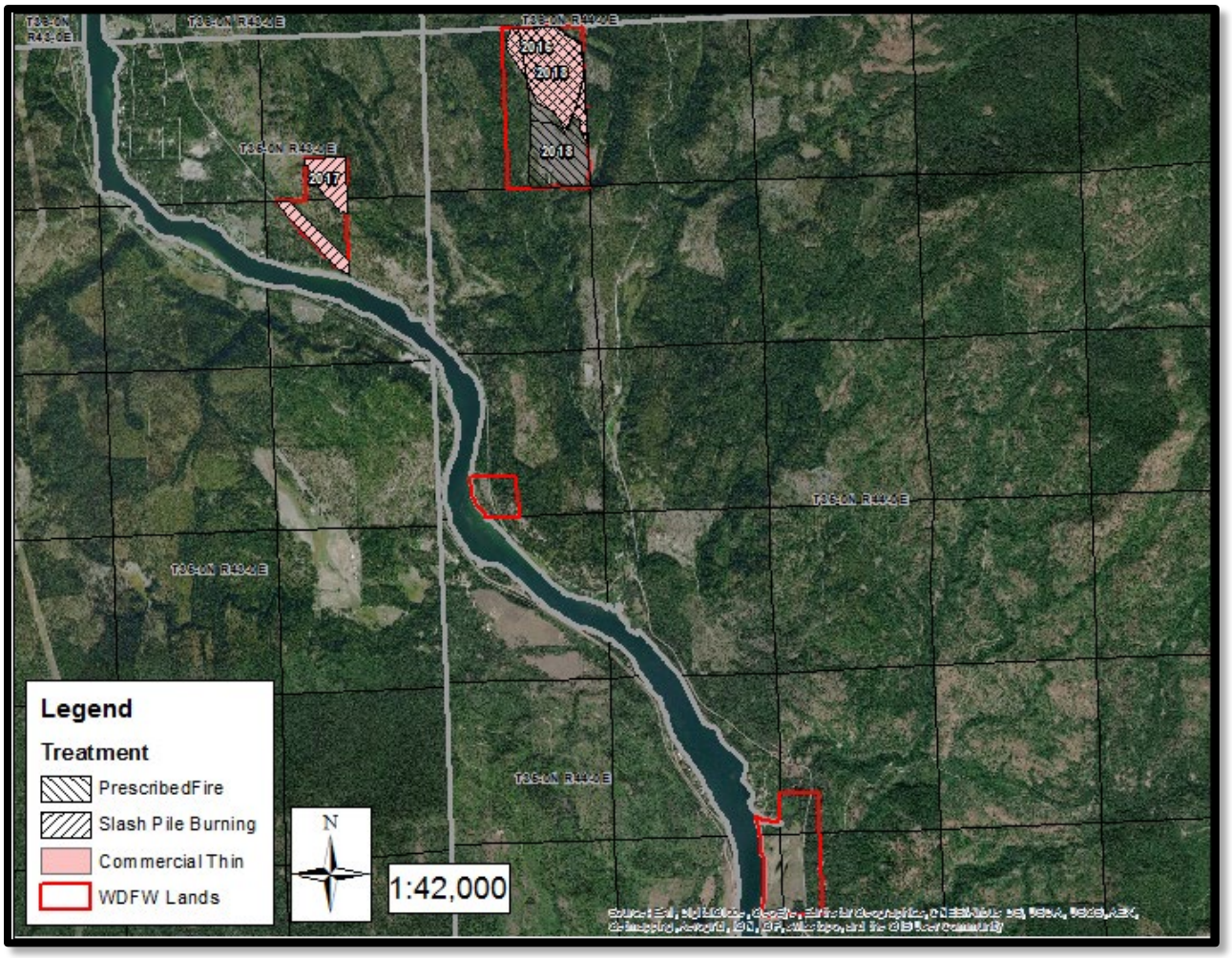
- Maintain thinned areas to the degree possible for with prescribed fire
- Maintain existing dense mature forests as is to provide northern goshawk habitat

LeClerc (Pend Oreille County)

Problem: Overstocked, unhealthy forests with high fuel loads had replaced historically open, mixed conifer forests and larch savanna.

Recent work: 2016-2019

- 169 acres commercially thinned with slash pile burning (Timber value paid for the work)
- 201 acres of prescribed fire - largely overlapping with thinned acres (Supported with Capital funds)
- Planted larch and white pine seedlings to restore tree species composition more fully.



Goals accomplished: Reduced fuel load, removed fuel ladders, increased growing space for dominant trees, increase wildlife forage and shifted tree dominance to more drought, insect, and fire resilient species.

Estimates of excess biomass removed: Cumulative 7,764 tons (38.6 tons/acre)

- Sawlogs and pulpwood – 5,680 tons (225 truckloads)
- Slash pile burning – 227 tons
- Prescribed fire – 1,857 tons

2016
Tree density before thinning

2016
Ground fuel deposits before thinning

2018
After thinning – prescribed fire started

2018
Tree planting after prescribed fire

Long term plans:

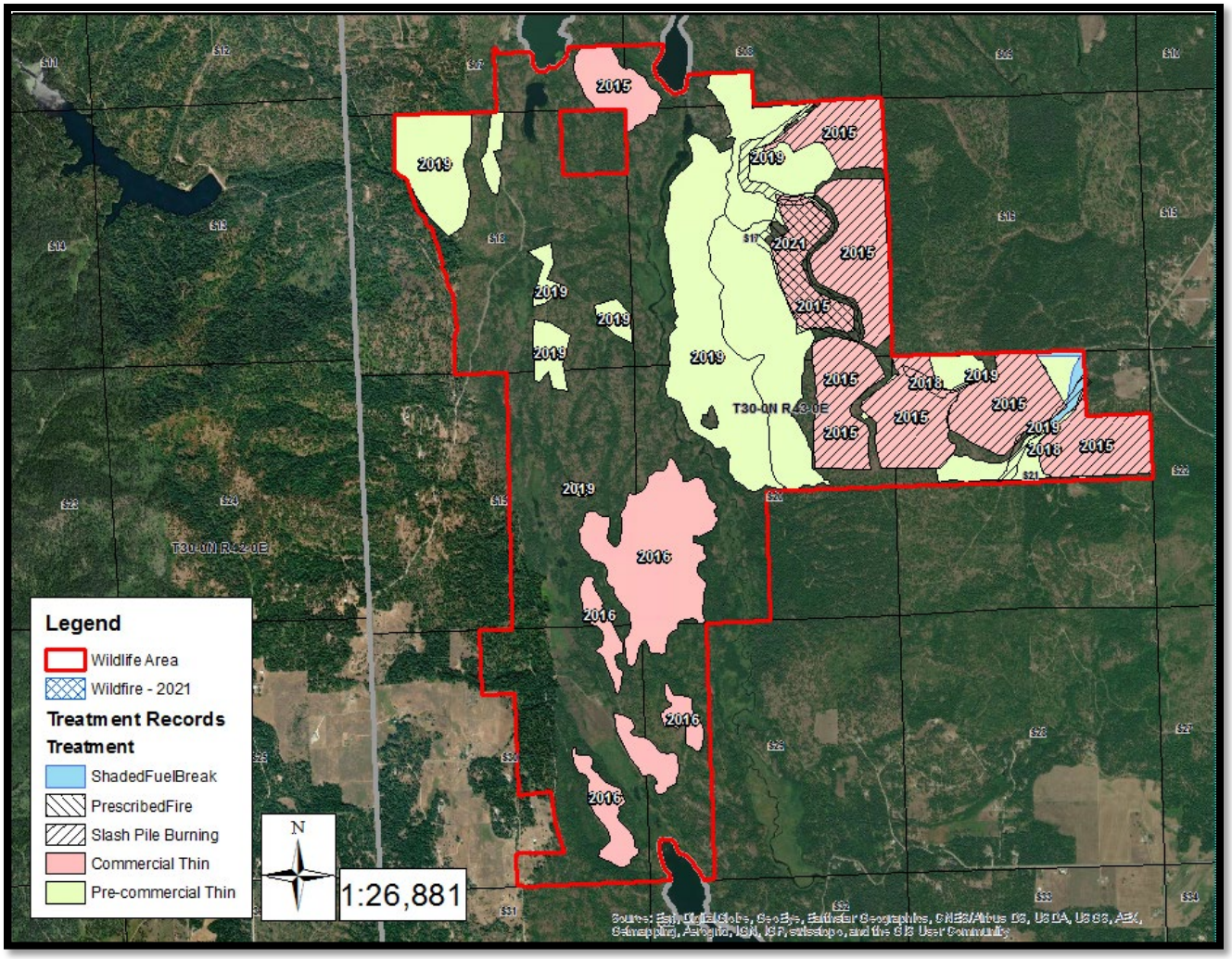
- Maintain healthy forest conditions to the degree feasible with prescribed fire
- Periodically thin as necessary to compensate for the lack of fire if prescribed burning is not feasible.

Rustlers Gulch Wildlife Area Unit (Pend Oreille County)

Problem: Overstocked forests in historically open mixed conifer and ponderosa pine savannah.

Recent work: 2016-2021

- 770 acres commercially thinned with 500 acres of slash pile burning (Harvested wood paid for the work)
- 710 acres of pre-commercial thinning and slash pile burning near roads
- 25 acres of shaded fuel break development (Funded/executed by DNR to help protect nearby homes.)
- 68 acres of prescribed burning



Goals accomplished: Reduced fuel load, removed fuel ladders, increased growing space for dominant trees and increased wildlife forage.

Estimate of excess biomass removed: 30,400 tons (Average 39 tons/acre)

- Sawlogs - 2,300 tons (900 truckloads)
- Pulpwood and smaller logs - 7,000 tons (300 truckloads)
- Slash pile burning – 1,100 tons

2017
Before commercial thinning

2017
After commercial thinning

2016
Shaded fuel break
Untreated neighbors property (left) vs WDFW land (right) prior to pile burning.

2018
Before non-commercial thinning

2018
After non-commercial thinning

Short terms plans: Apply prescribed fire in thinned units where feasible.

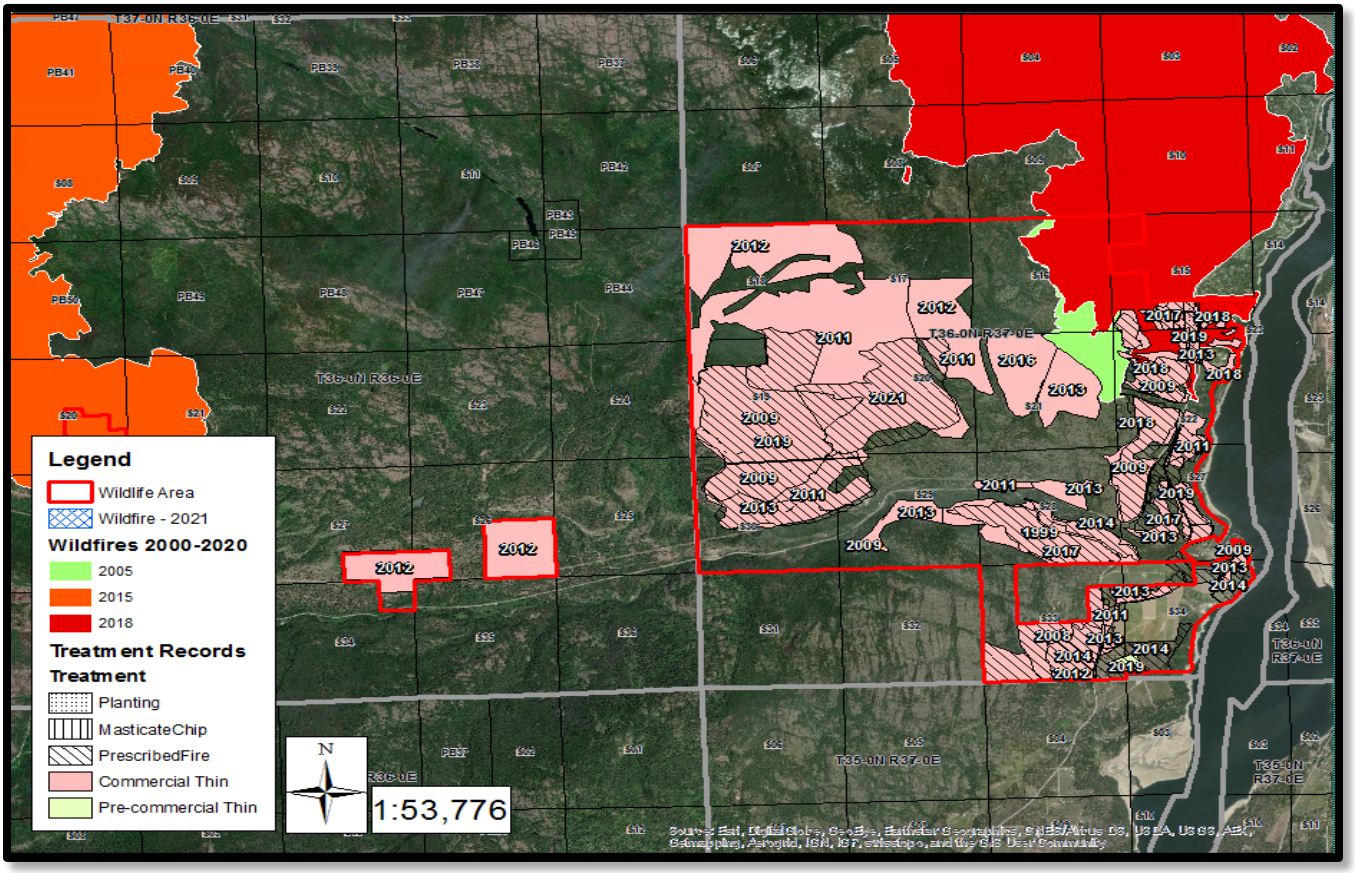
Long Term Strategy: Maintain forests to the degree possible with prescribed fire. Thin as necessary to compensate for the lack of fire.

Sherman Creek WLA (Ferry County)

Problem: Overstocked forests in historically open mixed conifer and ponderosa pine savannah with increase wildfire risk and reduced understory diversity.

Recent work: 2006-2019

- 4,123 acres commercially thinned (harvested wood covered thinning costs)
- 1,807 thinned acres treated with prescribed fire
- 46 acres of non-commercial thinning and chipping to reduce fuels near State Route 20 (Spring 2019)
- Planted larch seedlings in severely burned areas (Spring 2019)



Goals accomplished: Reduced fuel load, removed fuel ladders, increased growing space for dominant trees and increased understory vegetation/wildlife forage. Protected headquarters buildings by reducing adjacent fuels.

Estimate of excess biomass removed: 87,000 tons (21 tons/acre)

- Sawlogs and pulpwood - 75,000 tons (2,500 truckloads)
- Prescribed burning – Roughly 18,000 tons

Planned work in 2019-2021: Prescribed fire on up to 840 acres of thinned forests to further reduce fuels (estimate - 6,000 tons) and to stimulate the growth of forage for wildlife.

Untreated forest

Treated Forest
(Thinned and burned)

Prescribed Burning

Wildfire Risk and Damage Reductions Observed in 2018.

In August 2018 a wildfire started on the Sherman Creek Wildlife Area under severe conditions. Fire behavior specialist, Don Strand told Senator Shelly Short at a public meeting in Kettle Falls that "restoration thinning and burning conducted on Sherman Creek Wildlife Area prevented an uncontrollable spread of the Boyds Fire to the south and west".

Severe impacts in untreated areas

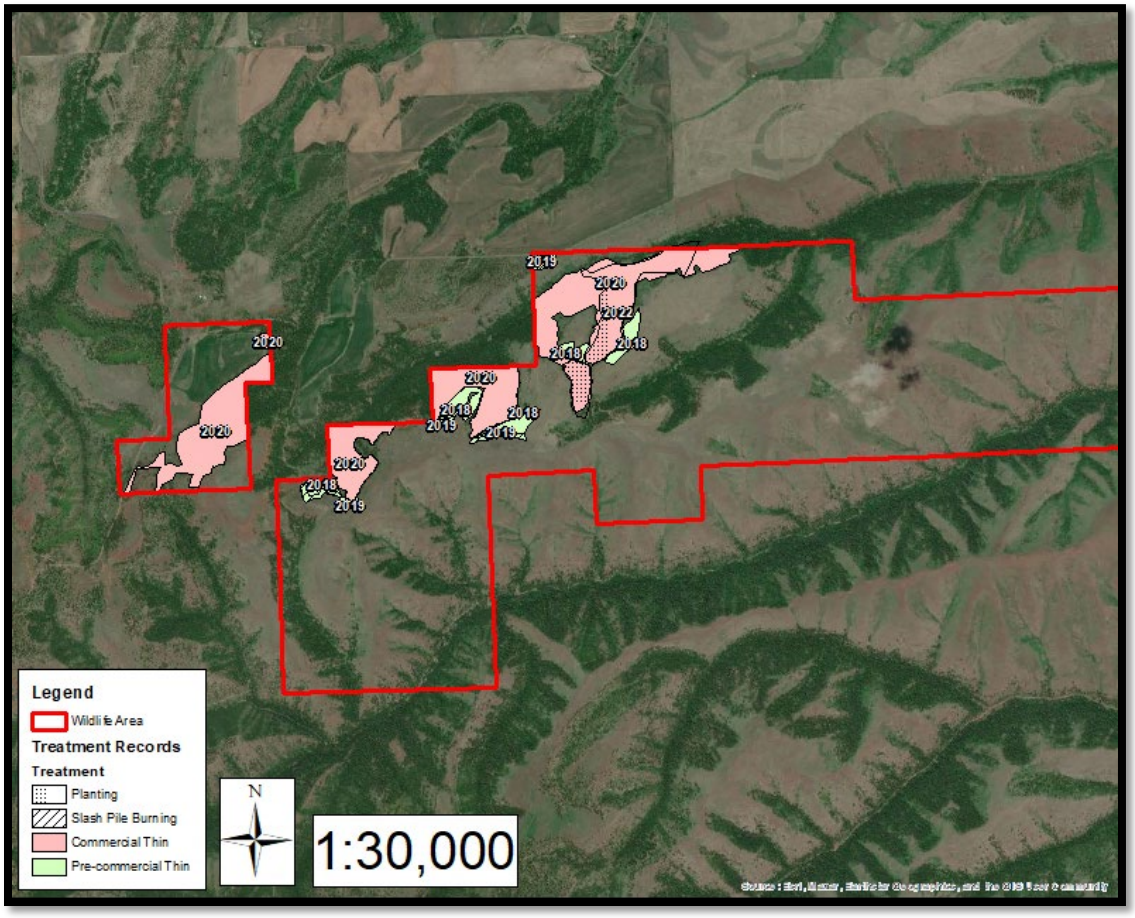
Mild impacts in treated areas

Long term strategy: Maintain forests with prescribed fire. Periodically thin when prescribed fire is not feasible.

Weatherly Wildlife Area Unit (Garfield County)

Problem: Overstocked forests in historically open mixed conifer and ponderosa pine savannah. Heavy dwarf mistletoe infestation in Douglas-fir. Dense pine thickets have developed where ponderosa pine is reclaiming abandoned agricultural fields.

Recent/Ongoing Work:
54 acres non-commercially thinned in 2018-2019 (RMEF and Capital funds), burning PCT slash piles, archeological surveys, and forest inventory work in preparation for commercial sale.



Goals Accomplished: Increased growing space for dominant trees, reduced fuel ladders

Planned work –2020-2022: Commercially thin overstocked forests that are heavily infested with dwarf mistletoe to reduce wildfire risk, favor more resilient species and increase forage for wildlife. Post-thinning prescribed fire, non-commercial thinning and possible planting.

Long Term Strategy: Maintain thinned areas to the degree possible for with prescribed fire. Periodically thin stands that can't be maintained with prescribed fire.

2020

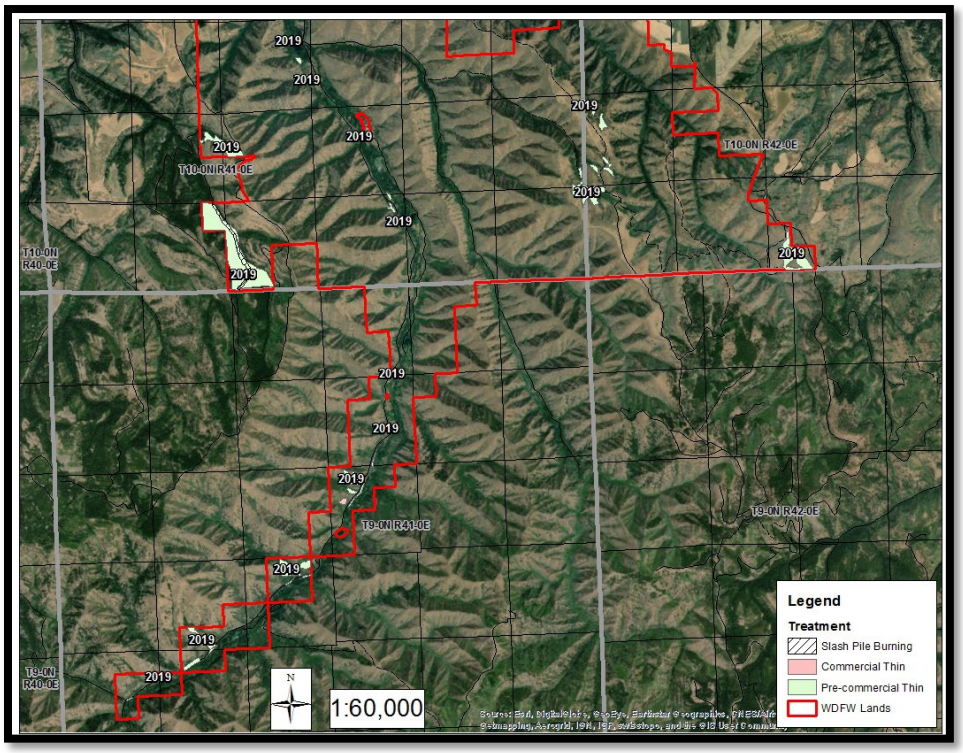
Before and after commercial thinning

Before pre-commercial thinning

After pre-commercial thinning

W. T. Wooten Wildlife Area Unit (Garfield and Columbia Counties)

Problems: Some areas overstocked with trees that sprouted after 2005 School Fire. Heavy dwarf mistletoe infestation in Douglas-fir. Forests needed to be put on a trajectory to re-attain historically open mixed conifer and ponderosa pine savannah.



Recent Work: Planted 155 acres with ponderosa pine in 2022. Pre-commercially thinned 403 acres in 2019

Goals Accomplished: Increased growing space for dominant trees, reduced fuel ladders. Established trees in places where that had been failing to grow

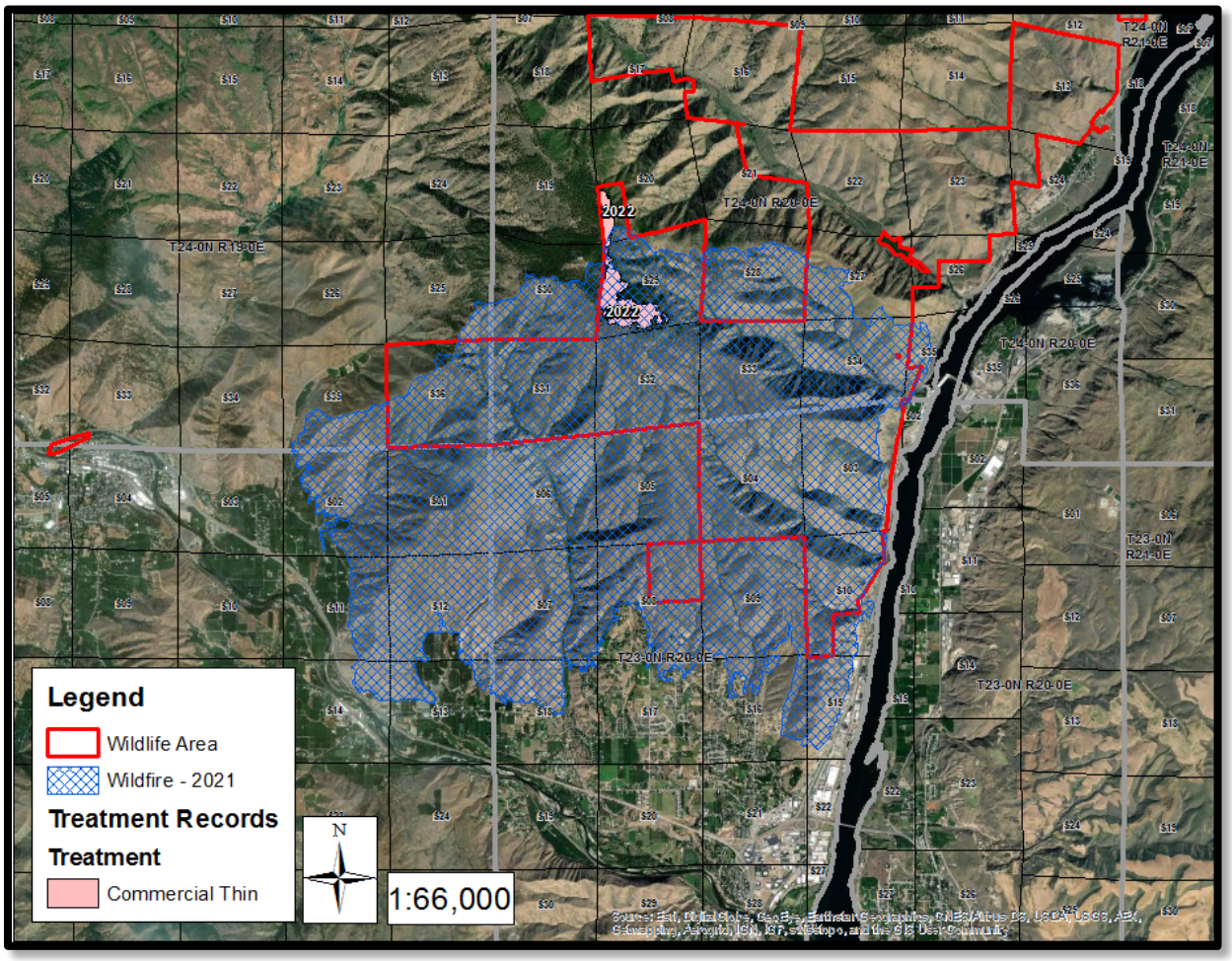
Long Term Strategy: Maintain thinned areas to the degree possible with prescribed fire. Periodically thin stands that can't be maintained with prescribed fire.

2019
un-thinned area at edge of thinning unit

2019
Thinning and burning slash piles

Burch Mountain – Chelan Wildlife Area (Chelan County)

Problem: Overstocked forests in historically open, ponderosa pine and mixed pine/Douglas fir woodlands. There is a high risk of severe wildfire damage as evidenced by the 2021 Red apple fire that burned much of the unit while WDFW was in the process of hiring a logger. About 1/5 of the project had to be dropped where the fire was so hot that all trees, including old growth legacy trees, were killed. The remaining areas that did not burn or did not burn hot enough and were still at risk.



Area dropped from the project – all trees dead

Area still treated – large trees still at risk

Recent work: 2021 – Commercially thinned 90 acres.

Goals accomplished: Reduced fuel load, removed fuel ladders, increased resources for dominant trees, shifted species composition toward fire and drought tolerant species, reinvigorated browse vegetation for mule deer within thinned areas.

Estimate of excess biomass removed: 1,800 tons (20 tons/acre).

Untreated

Treated

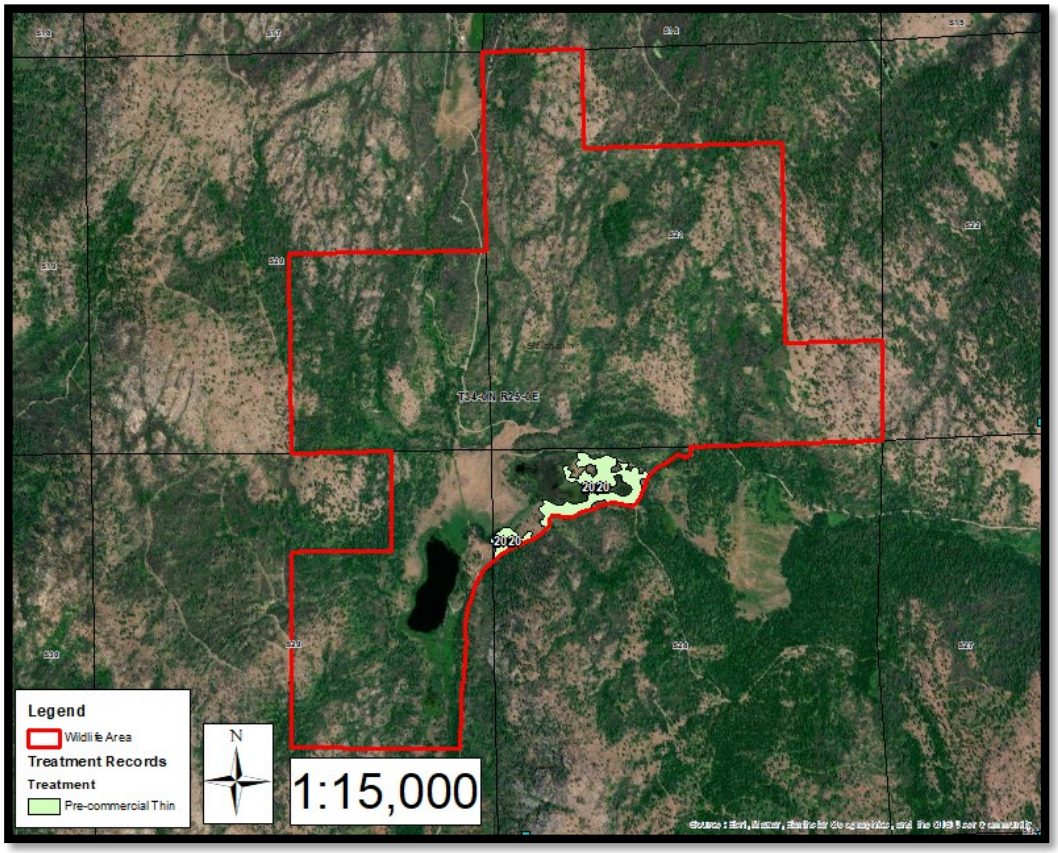
Planned work: 2023 - Burn slash piles and pre-commercially thin over dense thickets of small trees.

Long term strategy: Further reduce fuels with prescribed fires to the degree feasible. Ideally, future wildfires will be mild as they burn through the restored forest and maintain desired conditions. Periodically thin as necessary.

Buzzard Lake Unit - Sinlahekin Wildlife Area (Okanogan County)

Problem: Excessive grand fir encroachment into aspen woodlands.

Recent work (November 2021): Non-commercially thinned 30 acres removing 75% of invading conifers.



Goals accomplished: Prevented conifers from overtaking some of WDFW's nicest aspen stands. Reduced fuels along Windy Hill Road which is an important fire break.

Untreated aspen woodland

Treated aspen woodland

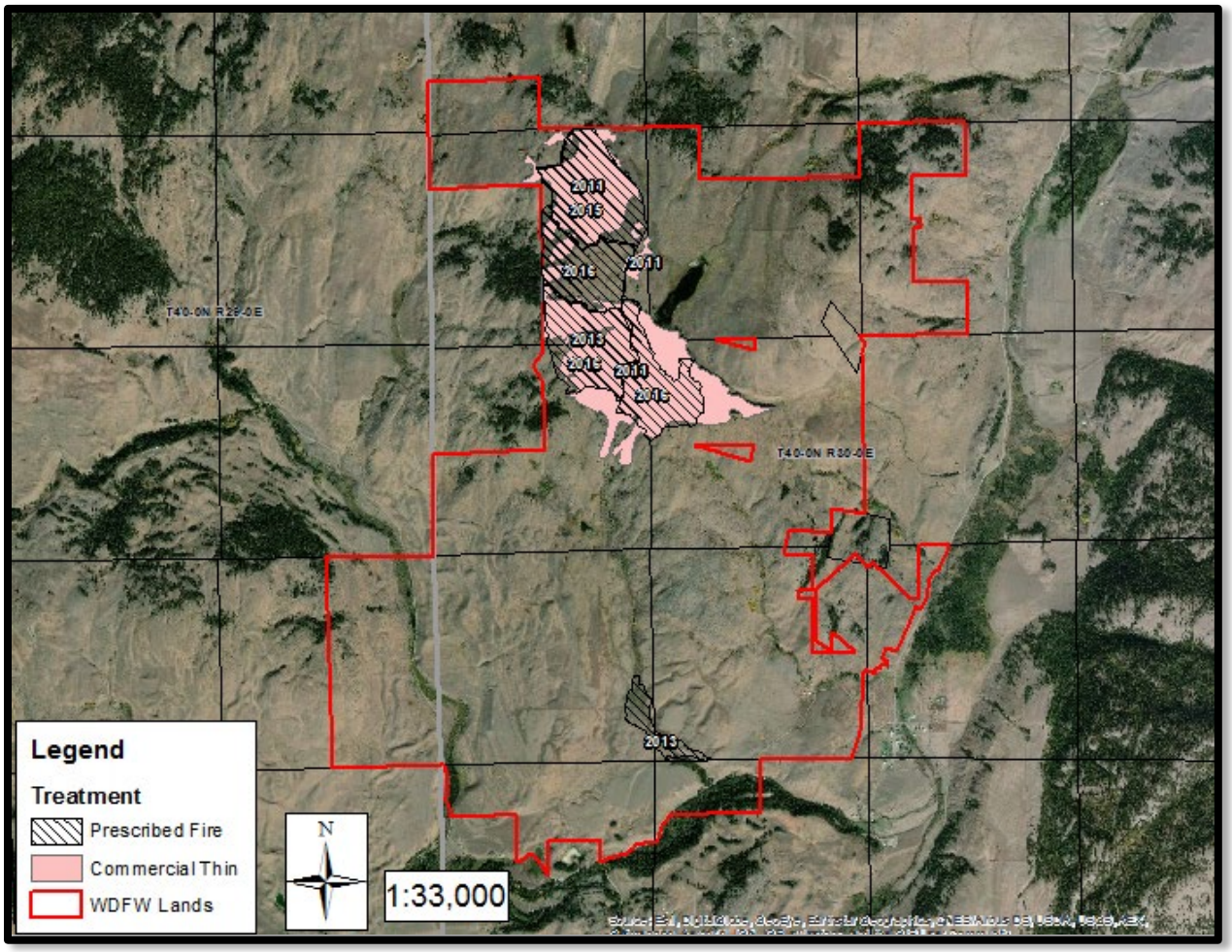
Long term strategy: Maintain forests with prescribed fire to the degree feasible. Periodically thin excess shade tolerant conifers where prescribed fire is not feasible.

Chesaw Wildlife Area Unit (Okanogan County)

Problem: Overstocked, unhealthy forests with high fuel loads had replaced more historically open, mixed conifer forests.

Recent work: 2011-2016

- 368 acres commercially thinned with slash pile burning (Timber value paid for the work)
- 407 acres of prescribed fire - largely overlapping with thinned acres (Supported with Capital funds)



Goals accomplished: Reduced fuel load, removed fuel ladders, increased growing space for dominant trees, increase wildlife forage and shifted dominance to more drought, insect and fire resilient species.

Short term plans: No action. The initial restoration work is complete.

Long term plans:

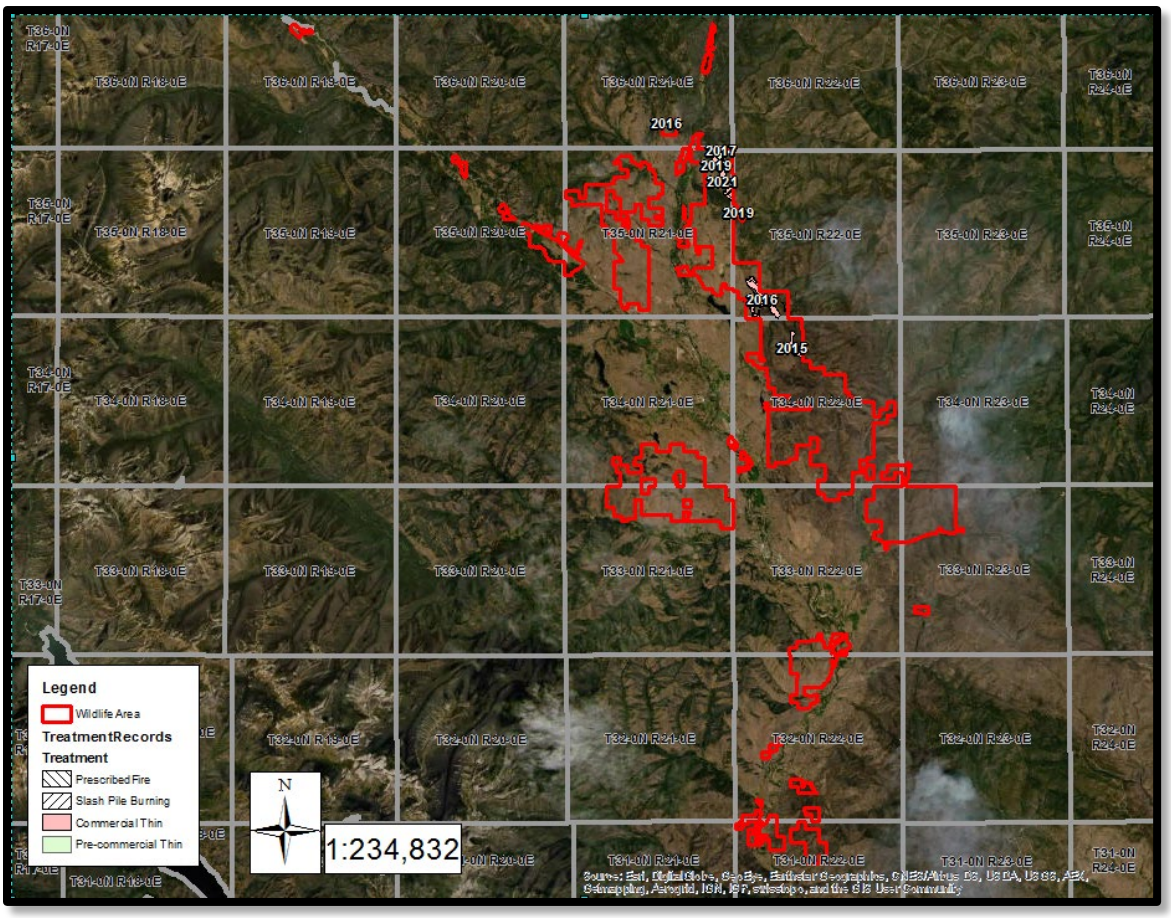
- Maintain healthy forest conditions as necessary with prescribed fire
- Periodically thin as necessary to compensate for the lack of fire if prescribed burning is not feasible.

Methow Wildlife Area (Okanogan County)

Problems: Overstocked conifer forests in historically open mixed conifer, ponderosa pine savannah and aspen woodland. Forests are highly vulnerable to wildfires as evidenced by the 2014 Carlton Complex Wildfire and other recent fires that have burned large portions of the wildlife area. Recent wildfires have had huge impacts on local communities including three firefighter mortalities, the loss of numerous structures, degraded air quality and reductions in tourism.

Recent work: 2014 - 2021 (Largely supported with RCO grants)

- Commercial thinning - 617 acres
- Non-commercial thinning – 211 acres
- Prescribed fire – 358 acres



Goals accomplished: Reduced fuel load, removed fuel ladders, increased growing space for dominant trees, reinvigorated declining aspen and increased wildlife forage production within treatment units.

Estimate of excess biomass removed

- Commercial thinning projects: 20 tons/acre.
- Prescribed burning: 13/2 tons/acre

Long term strategy: Maintain thinned forests with prescribed fire to the degree feasible. Periodically thin in areas where prescribed fire is not feasible. Monitor areas burned in recent wildfires.

Untreated

Commercially treated

Before non-commercial thinning
Prescribed burning

After non-commercial thinning
Forest after thinning and prescribed burning

Untreated

Commercially treated

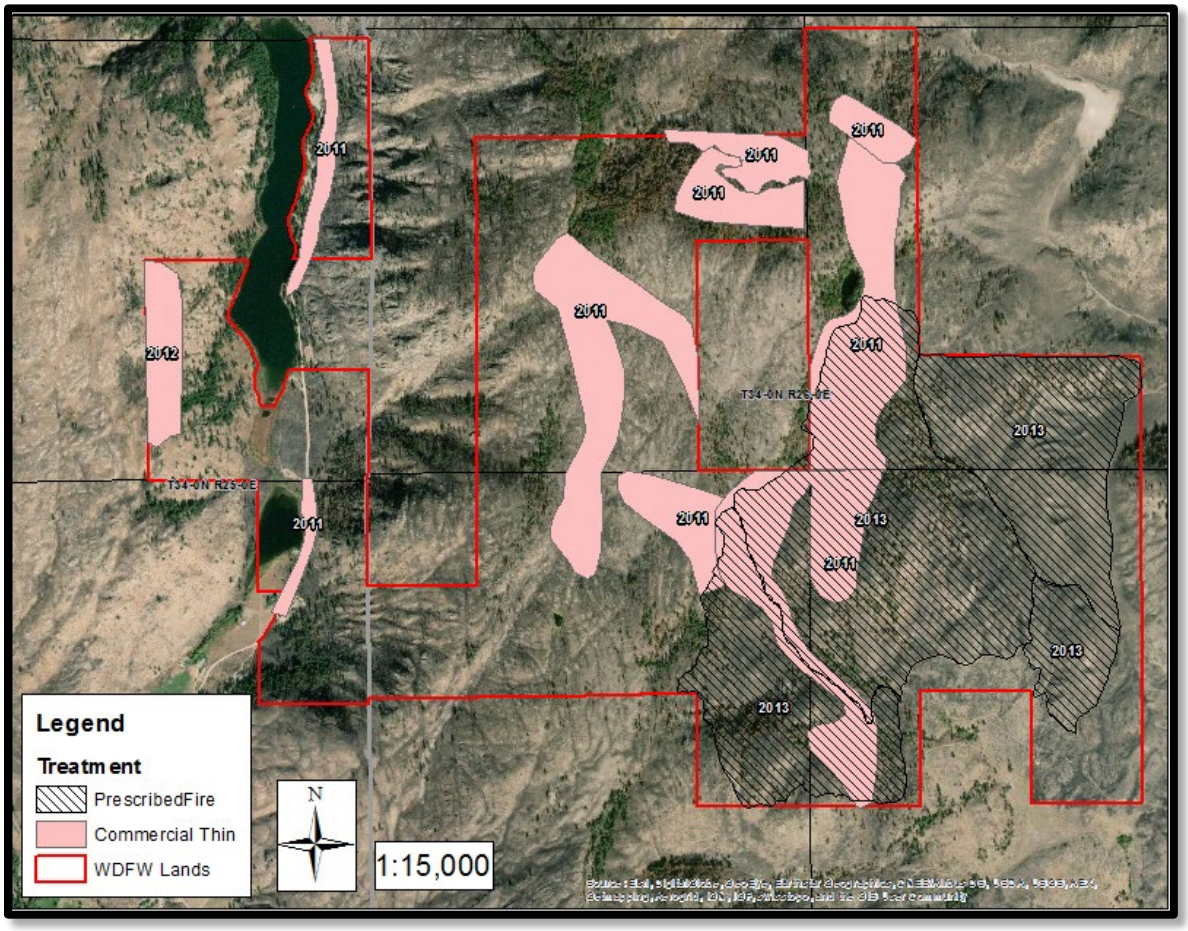
Forest after thinning and burning

Pogue Mountain Wildlife Area Unit (Okanogan County)

Problem: Forests were overstocked and unhealthy with high fuel loads. Severe wildfires burned large parts of the unit in 2008 and 2011.

Recent work: 2011-2013

- 315 acres commercially thinned
- 378 acres treated with prescribed fire (overlapping with about 1/3 of the thinned acres)



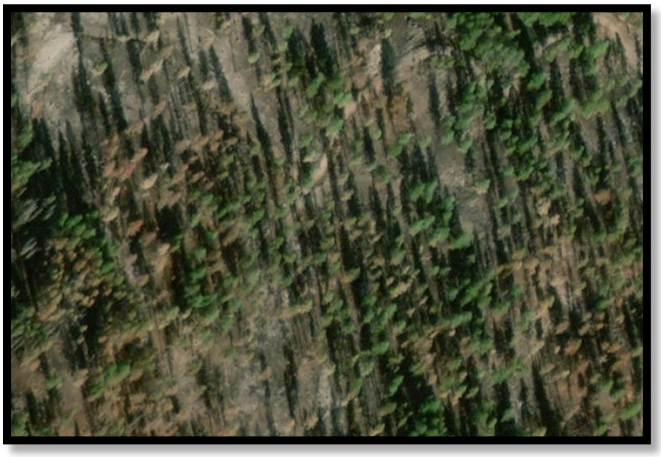
Goals accomplished: Reduced fuel load, removed fuel ladders, increased growing space for dominant trees, increase wildlife forage and shifted dominance to more drought, insect and fire resilient species.

Wildfire Risk and Damage Reductions Observed in the 2015 Okanogan Complex Wildfire: As evidenced in the below pictures wildfire effects were

- most severe in untreated areas
- less intense in thinned areas
- mild in areas that were both thinned and treated with prescribed fire

Post-wildfire aerial photo of area that was treated (thinned and burned) forest before the wildfire.

Post-wildfire aerial photo of forest that was partially treated (thinned only) before the wildfire



Post-wildfire aerial photo of forest that was untreated before the wildfire.

Short term plans: No action. The initial restoration work is complete and the site was recently burned.

Long term plans:

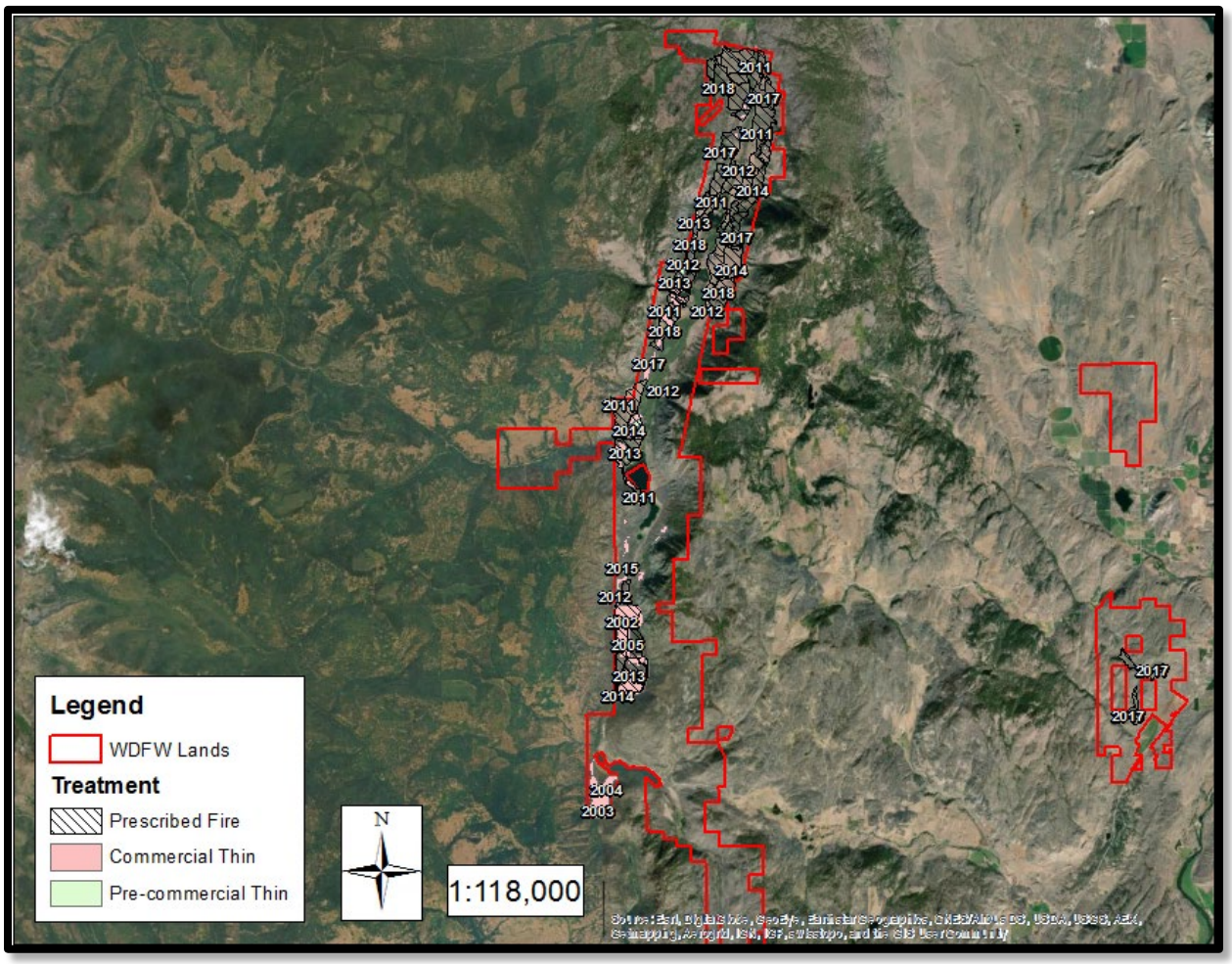
- Maintain healthy forest conditions as necessary with prescribed fire
- Thin as necessary to compensate for the lack of fire if prescribed burning is not feasible.

Sinlahekin WLA (Okanogan County)

Problem: Overstocked forests in historically open mixed conifer and ponderosa pine savannah and limited fire occurrence.

Recent work: 2003-2018 (Supported with RCO and capital funds)

- Thinning - 1,241 acres (commercial and non-commercial combined)
- Prescribed fire – 3,663 acres (2014 to present)



Goals accomplished: Reduced fuel load and catastrophic wildfire potential, increased growing space for dominant trees, and increased wildlife forage.

2011
Untreated

2011
Thinned

2013
Thinning plus prescribed fire

2015
Restored savanna

Wildfire Risk Reductions Observed in 2018.

In August of 2015 the Okanagon Complex wildfire burned over 300,000 acres in north central Washington. At the time, it was the largest fire ever recorded in Washington State. The fire burned onto the Methow, Scotch Creek, Sinlahekin wildlife areas under severe conditions. As the fire burned on the Sinlahekin WLA it ran into an area that was treated the year before. Because there was less fuel in the treated area, fire crews were able to directly attack and stop the fire in that area.

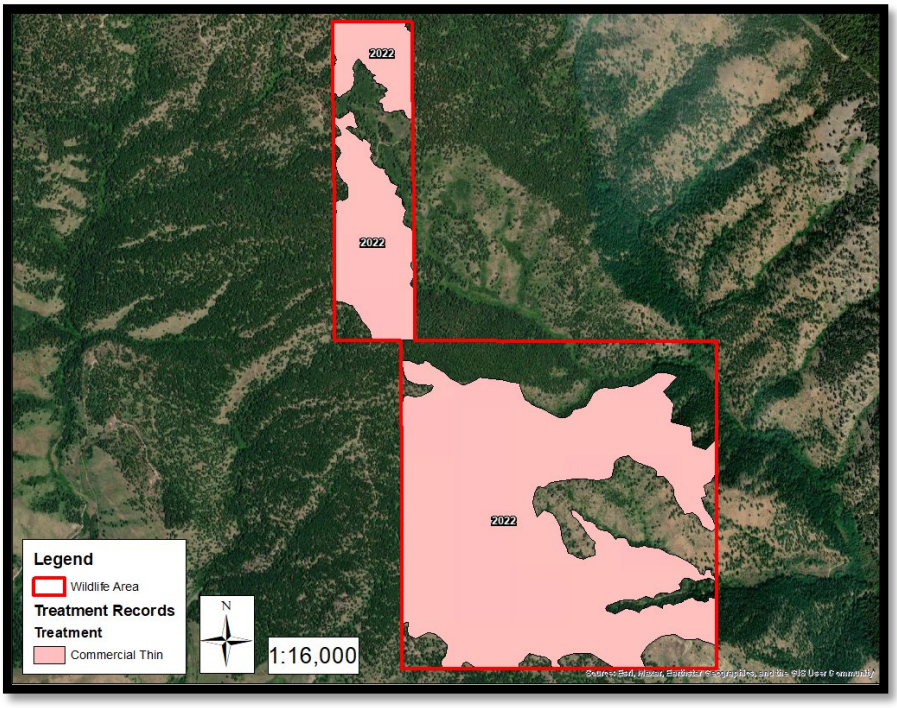
Planned work – 2019-2020: Prescribed fire will be applied to further reduce fuels and to stimulate forage for wildlife.

Long term strategy: Maintain restored forests with prescribed fire to the degree feasible. Periodically thin areas where prescribed fire is not feasible.

Swakane Unit – Chelan Wildlife Area (Chelan County)

Problem: Overstocked forest conditions in dry, mixed conifer forest with heightened risk of forest pathogens, insect outbreaks and uncharacteristically severe wildfire.

Recent work: 2022 – Commercial restoration thinning on approximately 543 acres.



Goals accomplished: Reduced fuel loading; removed trees with ladder fuels; increased stand health and resiliency; shifted species composition to that appropriate for site; reduced stocking levels to that appropriate for the site; shifted stands closer to the Historic Range of Variability (HRV); increased browse for ungulates.

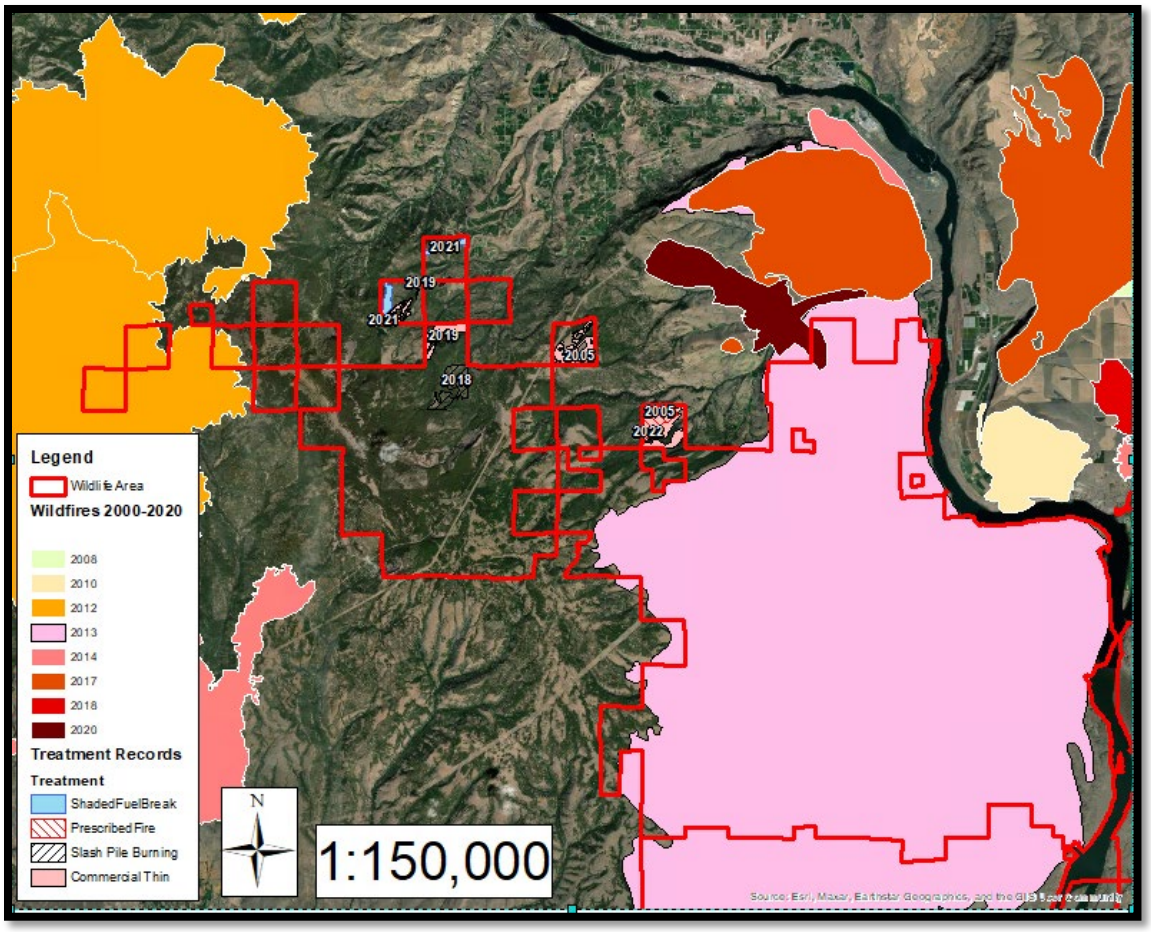
Estimate of biomass removed: 20,700 tons total or 38 tons/acre

Planned work: November 2022 - Burn slash piles and seed abandoned roads.

Long term strategy: Further reduce fuels with prescribed fires, if feasible, to reduce wildfire risk and maintain desired conditions. Periodically thin (commercially and pre-commercially) to maintain desired conditions.

Colockum Wildlife Area (Kittitas and Chelan Counties)

Problem: Overstocked forests with too much fir in historically open, mixed conifer forests of ponderosa pine, western larch, and Douglas fir. There is a high risk of severe wildfire damage as evidenced by the 2013 Colockum Tarps and the 2014 Table Mountain wildfires that burned more than 11,000 acres of forest on the wildlife area.



2013
Severely burned forests

2013
Downstream flooding impacts after the fire

Recent work

- 2022 – 260 acres of prescribed burning
- 2021 – 172 acres of non-commercial roadside fuel management in partnership with Chelan County.
- 2019 – Approximately 290 acres commercially thinned in a collaborative effort with Chelan County with 270 acres on WDFW and 20 acres on County land (Capital Funding and a federal Joint Chiefs grant).
- 2018 - Burned slash piles on 75 acres of recently acquired lands
- 2005 - Commercially thinned 770 acres.

Goals accomplished: Reduced fuel load, removed fuel ladders, increased resources for dominant trees, shifted species composition toward fire and drought tolerant larch and ponderosa pine, reinvigorated browse vegetation for ungulates within thinned areas.

Estimates of excess biomass removed:

- 2019 commercial thinning (Sawlogs and pulpwood) - 10,766 tons (35.9 tons/acre) from 290 acres
- 2018 pile burning - 49 tons from 75 acres

Before thinning

After thinning but prior to prescribed fire

Planned work – Fall 2022 through Fall 2023

- Complete an 863-acre commercial thinning project
- Potential prescribed fire on as much as 250 acres.

Long term strategy: Thin and do prescribed burning on up to 30% of forests then maintain restored forests with prescribed fire to the degree feasible. Periodically thin in areas where prescribed fire is not feasible

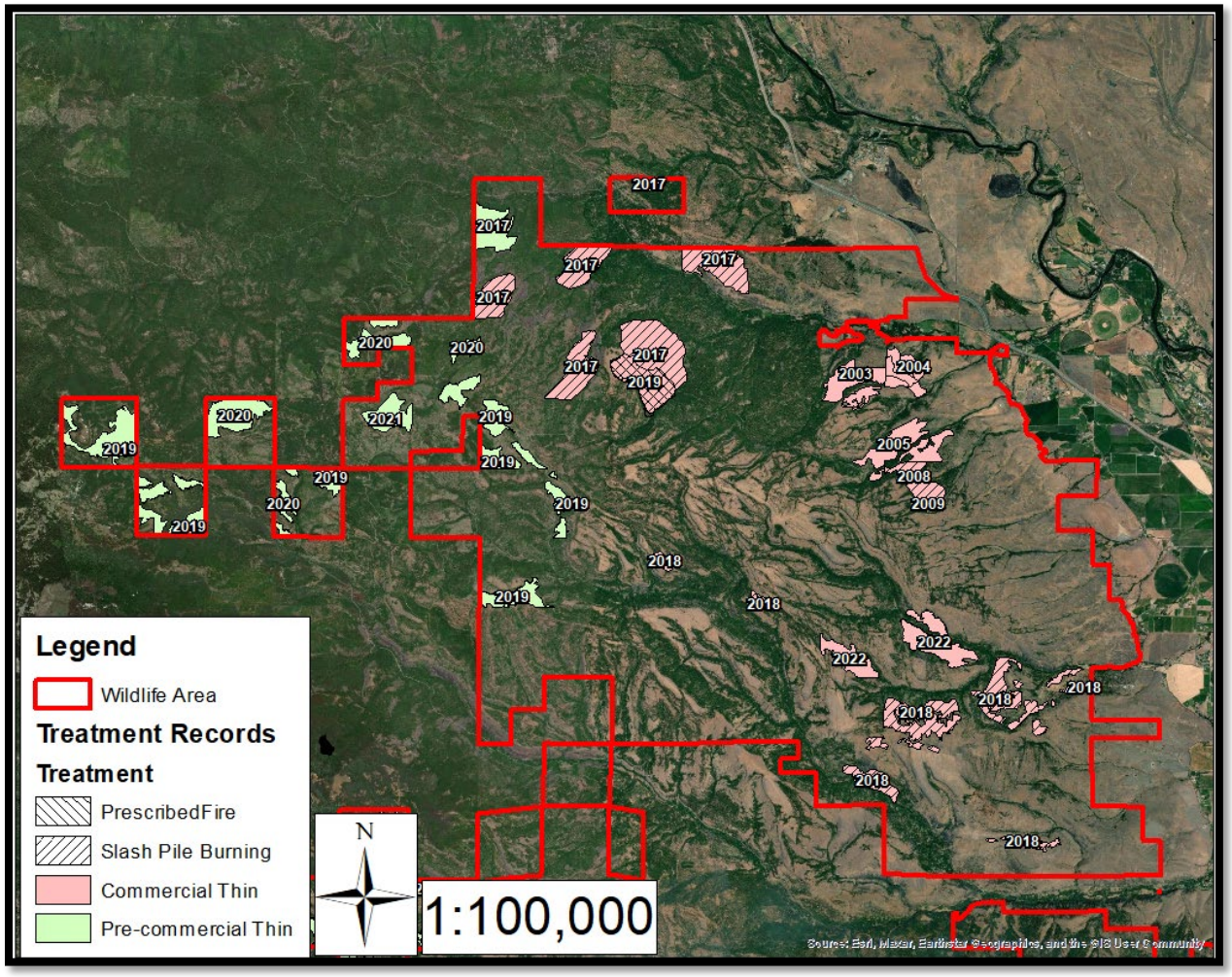
LT Murray Wildlife Area Unit (Kittitas County) as of October 15, 2022

Problem: Overstocked forests with severe mistletoe infestations in historically open mixed conifer and ponderosa pine savannah at lower elevations and young, overstocked plantations at higher elevations. As no significant wildfires have burned on the wildfire area in the last 20 years, it is highly vulnerable to large wildfires.

Recent work (2017-2022): 15% of forests thinned and 0.7% treated with prescribed fire

- 2,666 acres commercially thinned with slash piles burned
- 2,336 acres of non-commercial thinning
- 237 acres of prescribed fire

Older work (2003-2008): 2.5% of forests commercially thinned (848 acres).



Estimates of excess biomass removed in 2017-2022. **(Update to reflect Upper Robinson)**

- Sold to lumber and paper mills to offset project costs – 25,495 tons.
- Prescribed burning – 2,663 tons.
- Slash pile burning – 672 tons.

Goals accomplished: Reduced fuel loads in commercial thinning units, removed fuel ladders, increased growing space for dominant trees, decreased dwarf mistletoe in Douglas-fir, reinvigorated browse vegetation for deer and elk. Projects also provided 4,200 logs for use in-stream restoration projects. **Note:** The slash on most of the pre-commercial thinning units was left on the ground to decay. These areas are vulnerable to stand replacement fire until slash has rotted away, and trees are large enough to survive wildfires.

2017
Hutchins before commercial thinning

2017
Hutchins after commercial thinning

2019
Hutchings after thinning and prescribed burning

2018
Robinson Canyon after commercial thinning

2017
Taneum Project after commercial thinning

2017
Before pre-commercial thinning

2017
After pre-commercial thinning

2019
Before pre-commercial thinning

2019
After pre-commercial thinning

Planned work –

- About 70 acres of thinning in which wood will be placed in streams
- A commercial thinning project to treat about 500 acres and improve the effectiveness of roads as fuels breaks

Long term strategy: The LT Murray is in the Manashtash-Taneum watershed which has been ranked as a high priority in the 20-year Forest Health Strategic Plan for Eastern Washington. In association with that Strategy DNR forest health scientists estimated that 25-45% of the wildlife area's forests needed treatments to restore the historic ratios of open and mature forests associated with a healthy, resilient ecosystems. WDFW has already thinned 15% of the forests and will likely transition to maintenance mode after 30% of forests have been thinned.

Oak Creek Wildlife Area Unit (Yakima and Kittitas Counties)

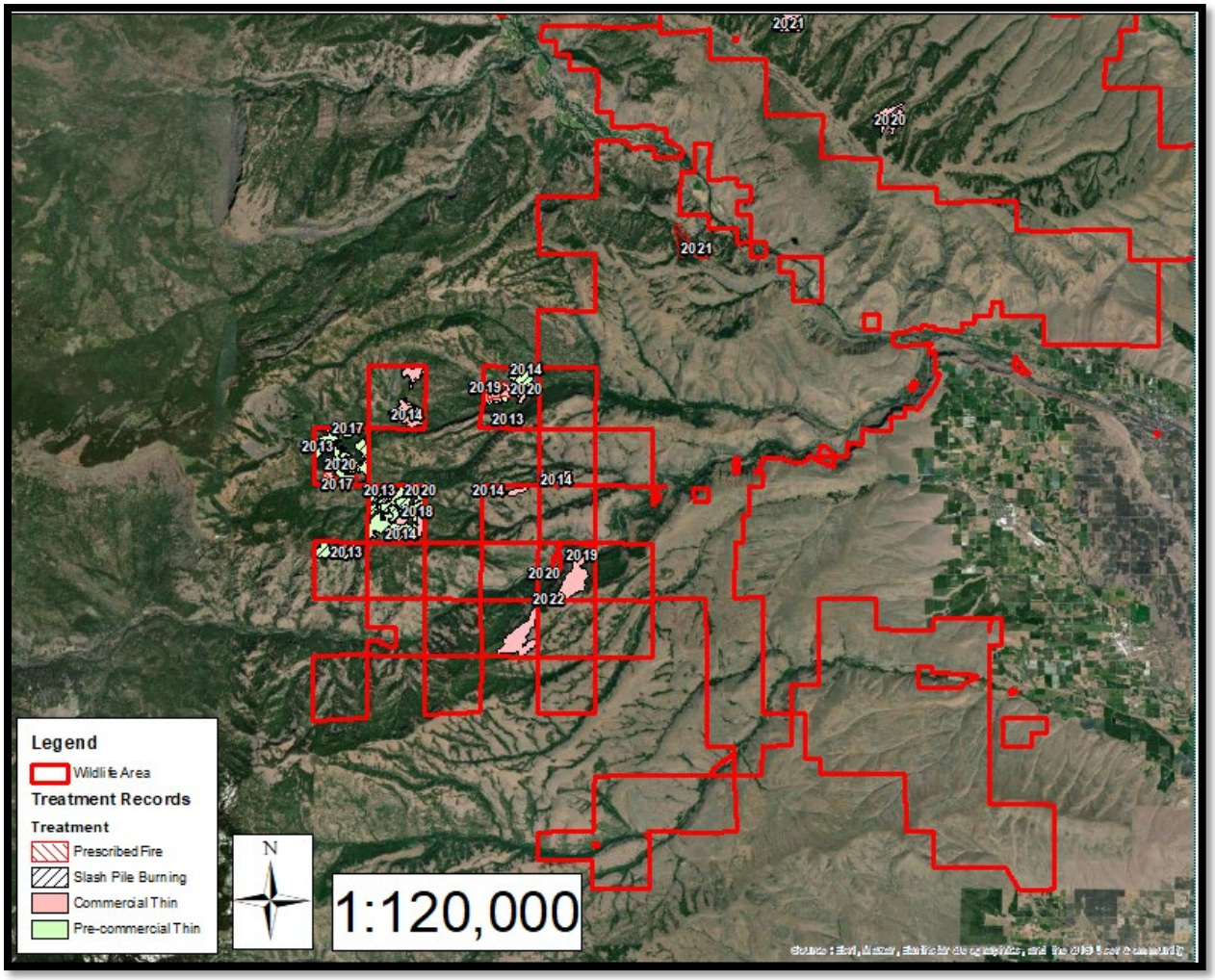
Problem: Historically open mixed conifer forests and ponderosa pine savannahs are overstocked and, in some cases, have severe mistletoe infestations. Many high elevation forests were logged by previous owners and planted as dense, monotypic plantations.

Recent work 2014-2022: Supported with Capital funds, RCO grants and RMEF grants

- 1,779 acres of non-commercial thinning (piles burned on ~201 acres)
- 810 acres commercially thinned at with slash piles burned on 447 acres so far.
- 270 acres of prescribed fire in thinned areas

108 acres of post-wildfire tree planting

Goals accomplished: Reduced fuel load, removed fuel ladders, increased growing space for dominant trees, Increased understory vegetation and wildlife browse, decreased dwarf mistletoe in Douglas-fir.



Planned work 2023-2025:

- Up to 500 acres of non-commercial thinning
- Up to 300 acres of pre-commercial thinning
- Up to 600 acres of prescribed burning

2014
Before non-commercial thinning

2014
After non-commercial thinning

2014
Before commercial thinning

2015
After commercial thinning

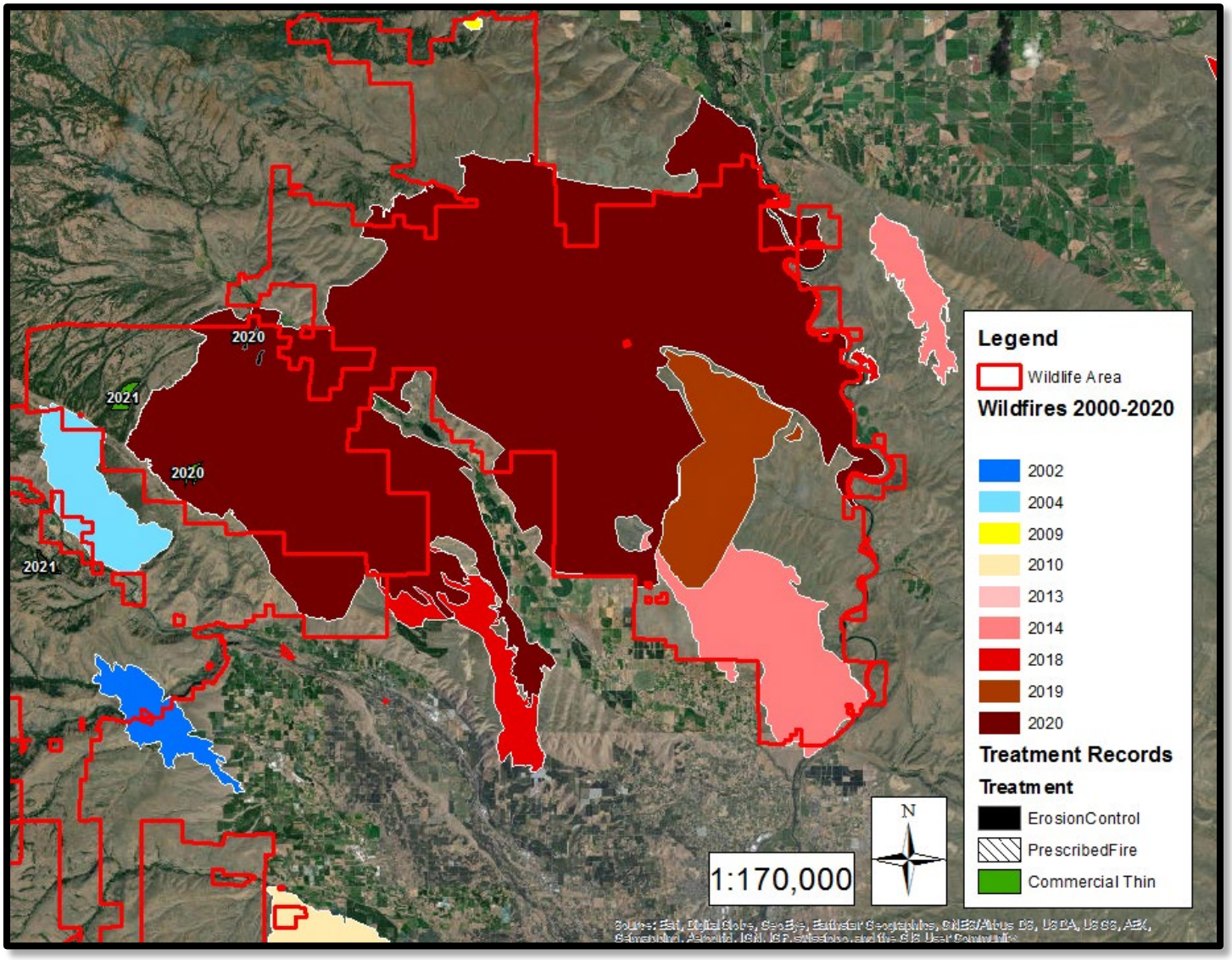
Long term strategy: Maintain restored forests with prescribed fire to the degree feasible. Periodically thin in areas where prescribed fire is not feasible.

Wenas Wildlife Area (updated November 18, 2021)

Problem: Overstocked forests in historically open ponderosa pine savannah and mixed conifer forest with severe mistletoe infestations. Such conditions contributed to the intensity of the 75,000-acre Evans Canyon Wildfire in 2020 that burned most of the wildlife area including 56% of the forests (4,700 acres). While the fire was restorative in some areas, it burned uncharacteristically intense in others transforming the problem of excess live biomass into excess dead biomass which is much harder to manage.

Recent work 2020-2021: Supported with capital funding and RCO grants.

- 216 acres commercially thinned (1/3 burned just prior to thinning when WDFW was advertising to hire a logger).
- 56 acres of emergency riparian erosion prevention in severely burned riparian areas.



Goals accomplished:

- Commercial Thinning Units - Reduced fuel loads and removed fuel ladders, increased growing space for dominant trees, decreased dwarf mistletoe in Douglas-fir, reinvigorated browse vegetation for deer and elk.
- Emergency Erosion Control Units – Placed logs across stream and bare slopes to prevent erosion in the event of mass runoff events before vegetation recovers. No such events have occurred yet.

Post-wildfire conditions in severely overstocked forests

Commerically thinned areas: The same prescription was applied to both unburned and burned areas in which most of the smaller to mid-sized trees were cut and most of the larger trees were retained.

Planned work – 2022-2025

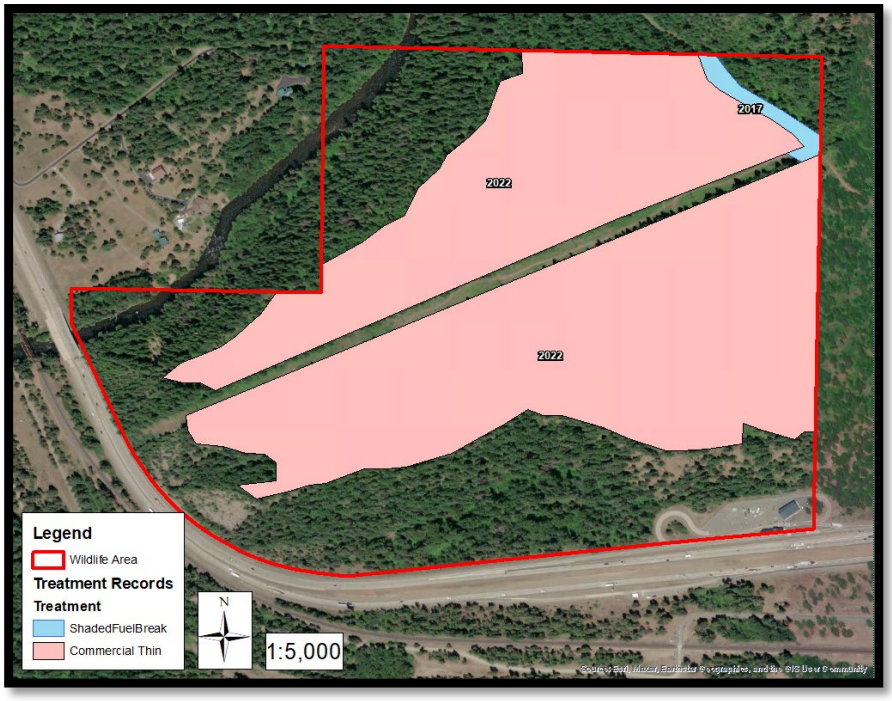
- Complete a commercial thinning project in the Wildland Urban Interface in the unburned area forest on the northern edge of the wildlife area.

Long term strategy: Monitor Forest regeneration in burned areas. Pre-commercially thin or apply prescribed fire as needed to prevent the return to overstocked conditions. Continue to commercially thin unburned forest where feasible to increase resiliency.

Yakima River Unit – LT Murray Wildlife Area (Kittitas County)

Problem: Overstocked forests in historically open, ponderosa pine and mixed pine/Douglas fir woodlands with a high risk of uncharacteristically severe wildfire.

Recent work:
2022 - Commercially thinned 111 acres.
2017 - Installed a shaded fuel break in support of a community wildfire protection strategy.



Goals accomplished: Reduced fuel loads, removed fuel ladders, increased resources for dominant trees, shifted species composition toward fire and drought tolerant species, reinvigorated browse vegetation for deer and elk.

Estimate of excess biomass removed: 2,850 tons (26 tons/acre) sent to mills.

Planned work: Burn slash piles and seed landings.

Long term strategy: Prescribed fire is a challenge due to the proximity to SR-90. Periodically thin as necessary to compensate for the lack of fire.

Before

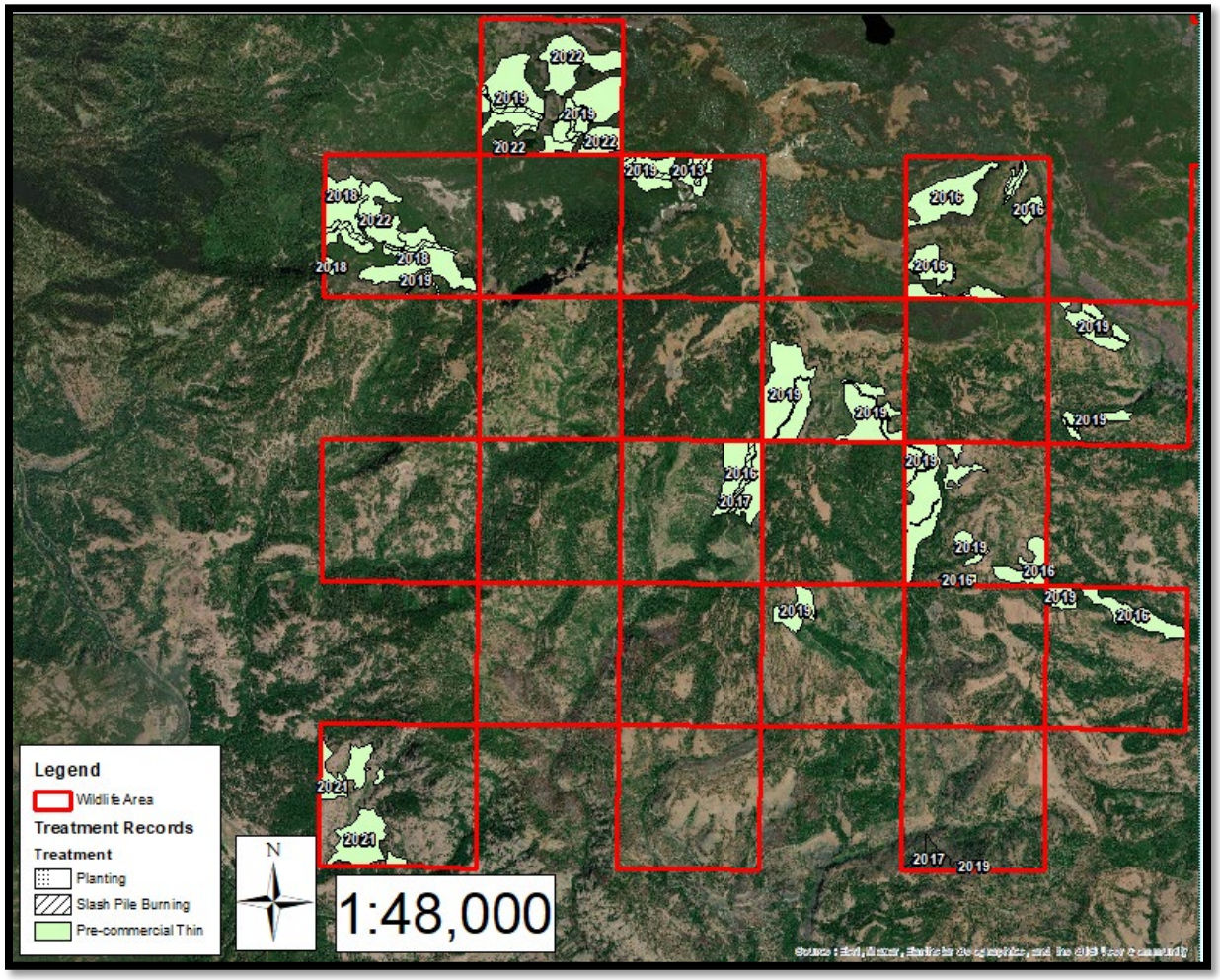
After

Rock Creek Unit of the Oak Creek Wildlife Area (Yakima and Kittitas Counties)

Problem: Historically open mixed conifer forests and ponderosa pine savannahs are overstocked and in some cases have severe mistletoe infestations. Many high elevation forests were logged by previous owners and planted as dense, monotypic plantations.

Recent work 2014-2022: Supported with Capital funds, RCO grants and RMEF grants

- 1,863 acres of non-commercial thinning (fuels piled and burned on 120 acres)
- 108 acres planted after the Left-Hand Wildfire.



Goals accomplished: Increased growing space for dominant trees to accelerate succession. Removed fuel ladders. Increased in understory vegetation and wildlife browse, decreased dwarf mistletoe in Douglas-fir.

Long term strategy: Allow forests to naturally progress towards climatic climax conditions with as little intervention as possible. Some areas may require commercial thinning to accelerate growth in about 15 years.

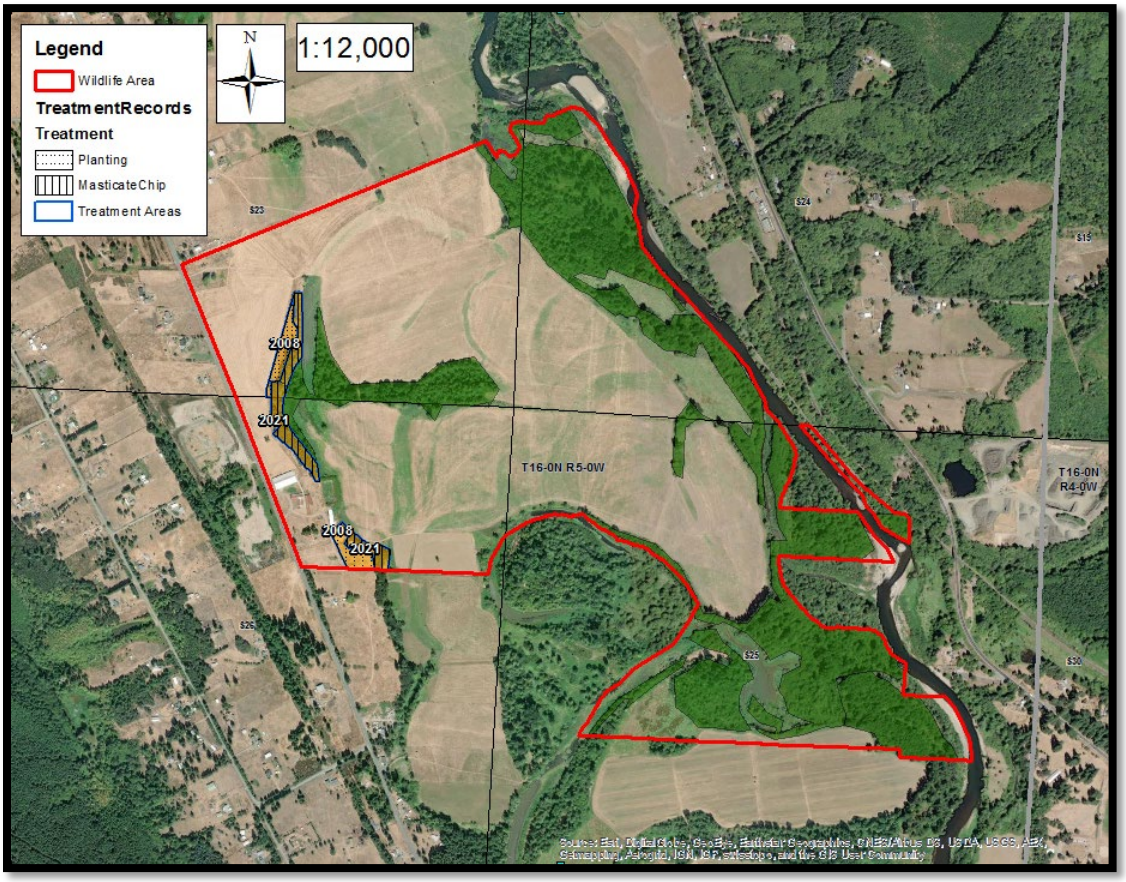
Before thinning

After thinning

Davis Creek Wildlife Area Unit (Thurston County)

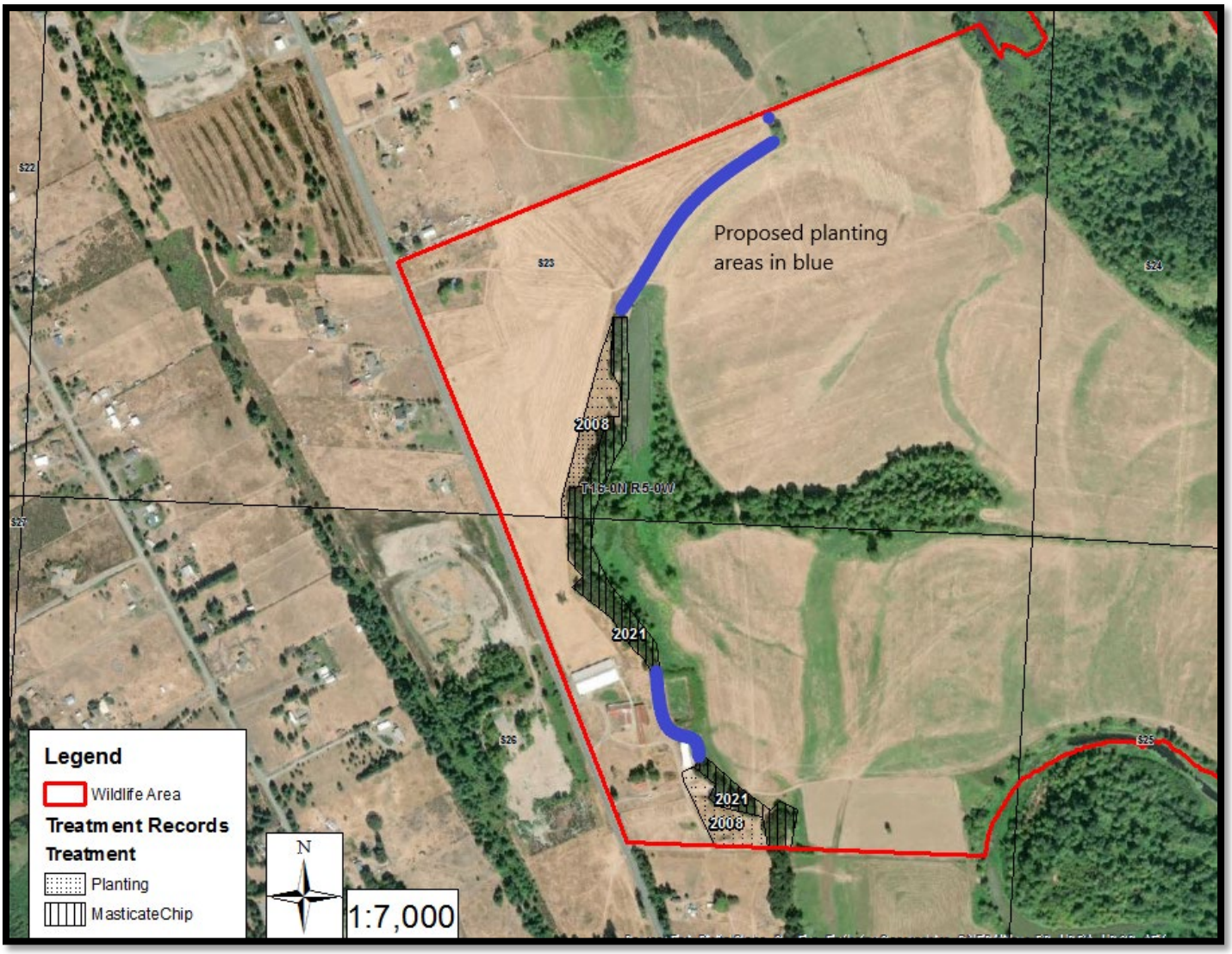
Problem: Invasive Himalayan blackberry was filling in the oak woodland understory. Also, pasture grasses that were imported prior to acquisition are hindering oak seedlings establishment. Riparian and floodplain forests are naturally recovering from past logging and require no treatments.

Recent work: 2021 – Invasive blackberry mowed under 2 acres of oaks. Oak planting areas are mowed annually to protect seedlings from excessive competition.



Treated Untreated

Long term strategy: Maintain restored oak woodlands forests with mowing or prescribed fire to the degree feasible. At some point it would be good to plant additional oaks to close the gaps in the oak woodland corridor on the site created by past farming and construction. The remaining floodplain forests don't require any active management.


Proposed planting areas in blue
2008
2021
2021
2008
Legend
Wildlife Area
Treatment Records
Treatment
Planting
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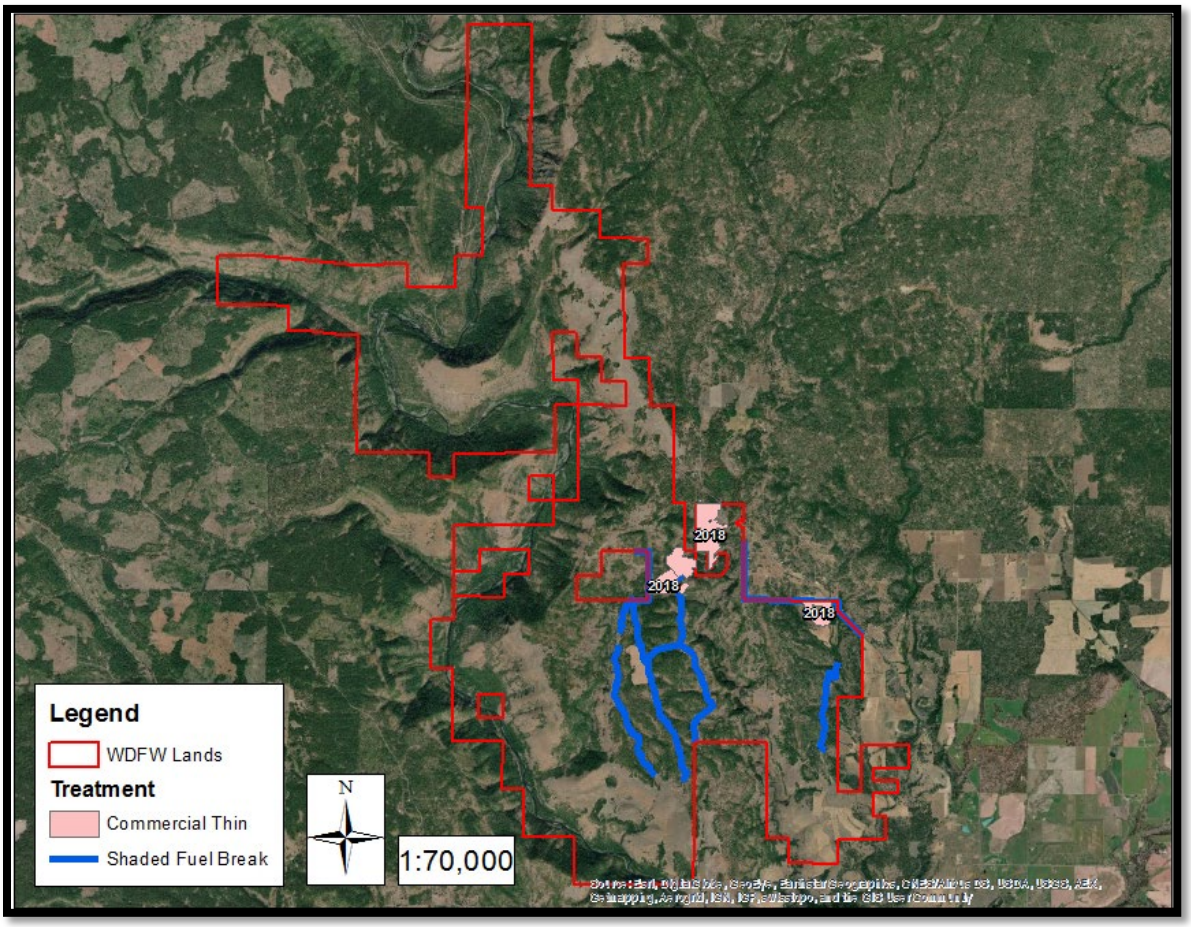
Klickitat Wildlife Area (Klickitat County)

Problem: Overstocked forests with a high risk of severe wildfire and insect damage. Conifers are shading out oak woodlands vital to the western gray squirrel.

Goals: Reduce fuel loads, remove fuel ladders, increase growing space for dominant trees (especially oaks) and increase forage for wildlife.

Recent work: 2016-2019

- Create and maintain fuel breaks installed along roads to reduce large wildfire risks
- Commercially thinned 168 acres (Supported with Capital Funds)



Estimates of excess biomass that was removed: Cumulative 4,448 tons (26 tons/acre –a little more than one log truck load per acre)

- Sawlogs – 3,361 tons (140 loads)
- Pulpwood – 1,087 tons (45 loads)
- Slash piles - 347 tons

2018
Before thinning

2018
After thinning

Fuel breaks: Crews removed small trees, brush, and low branches for 100 feet on each side of roads to keep fire intensity low so that wildfires are easier and safer to fight along roads.

Before fuel break treatment

After fuel break treatment

Planned work: An additional thinning project to restore oak woodlands in 2023.

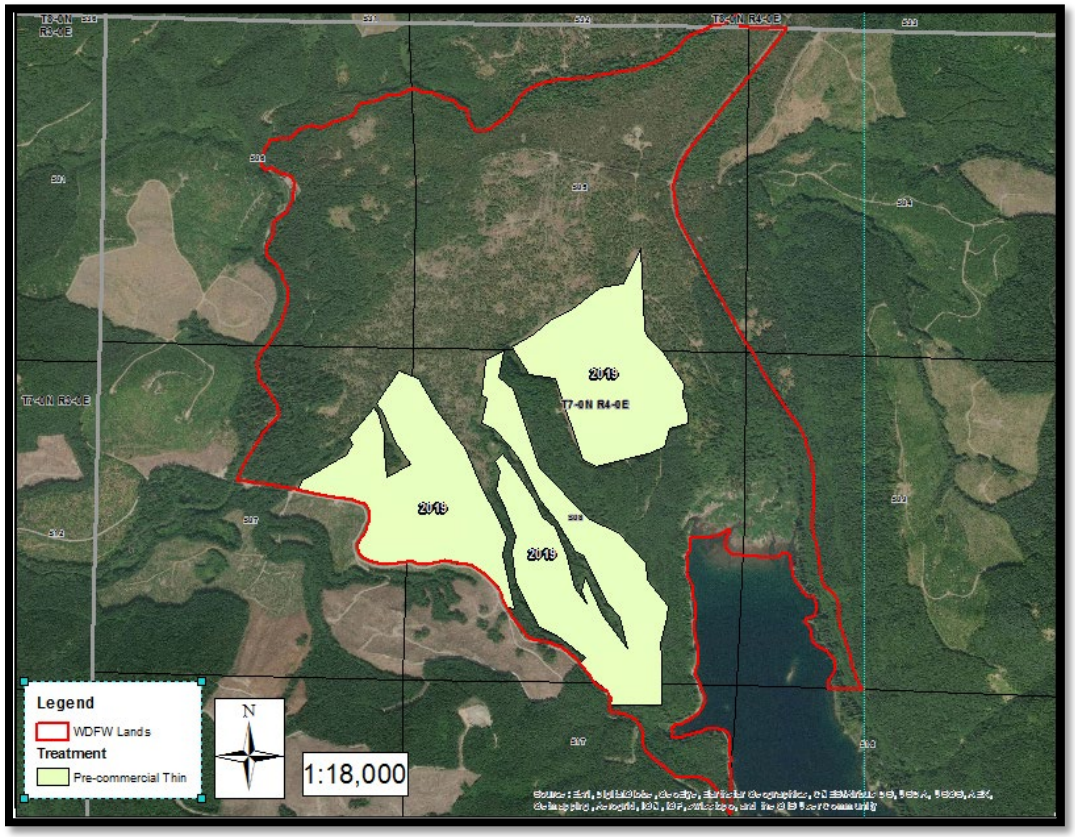
Long term strategy: Maintain restored forests with prescribed fire to the degree feasible. Periodically thin in areas where necessary to maintain oak woodlands in places where prescribed fire is not feasible

Merrill Lake (Cowlitz County)

Problem: The unit contained overstocked young plantations that would have become stunted and provide little forage for game species like elk unless thinned.

Goals: Accelerate growth, increase future structural/species diversity, and increase forage for wildlife.

Goals accomplished (2019): Increased growing space for dominant trees and increased understory vegetation/wildlife forage on 400 acres.



Untreated (couple years older) Treated

Planned work: No additional work planned at this time.

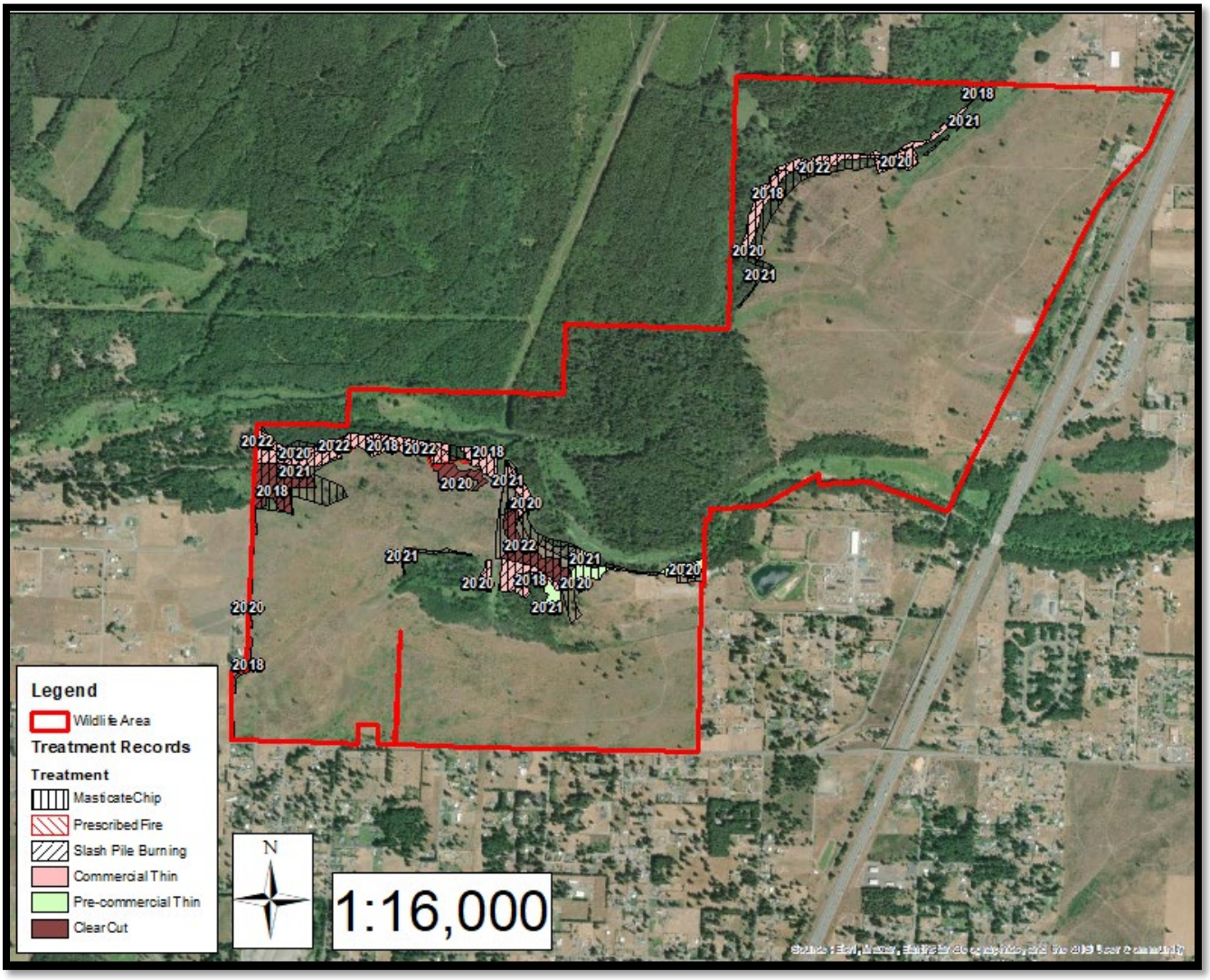
Long term plans: Most forests will be left alone to mature naturally as the presumed historic condition was about 75% closed canopy, mature forest. A second thinning may occur in about 20 years to ensure rapid development of the desired future condition (old growth) and create small openings for wildlife that depend on early seral conditions.

Desired future conditions

Averted plantation conditions

Scatter Creek Wildlife Area (Thurston County) Updated November 2021

Problem: Without fire, Douglas fir shades out critically imperiled oak woodlands and prairies containing federally threatened species (butterflies and Mazama pocket gophers). The fir trees were also increasing fuels loads and increasing wildfire risks as evidenced by a severe wildfire in 2017.



Recent work:
2022 - Brush mowing, Oregon ash removal and Prescribed fire in the understory of oak woodlands (49 acres).
2021 – Brush mowing and Oregon ash removal in the understory of oak woodlands (58 acres).
2020 – Brush mowing and Oregon ash removal in the understory of oak woodlands (47 acres)
2020 – Pile burning in commercially thinned areas
2018 – Commercial thinning to restore 27 acres of oak woodland and 25 acres of prairie.

Estimate of excess biomass removed:
2022: 97 tons of branches was burned in slash piles.
2020: 265 tons of branches was burned in 270 slash piles.
2018: 5,207 tons (100 tons/four log truck loads per acre) Wood was hauled to mills, given to the public for firewood or used for stream restoration.

Goals accomplished: Removed overtopping conifers and reduced fuels so that the treated lands can be managed for rare species associated with prairies and oak woodlands. Reduced fuels where necessary to reduce the wildfire risk to adjacent homes.

Planned work: Pending a potential acquisition that could facilitate access, there may be another project to restore 17 acres of oak woodland and 35 acres of prairie restoration on the Scatter Creek Wildlife Area. Another 50 acres of oak woodland need to have Oregon ash and brush thinned from the understory. Scotch broom must be continuously controlled in all restored areas.

Long term strategy: Maintain restored forests with prescribed fire to the degree feasible. Periodically mow and thin in areas where prescribed fire is not feasible.

Changes on the South Unit

Pre-treatment oak woodland/prairie edge

Post-treatment oak woodland/prairie edge

Pre-treatment prairie

Post-treatment prairie

Non-commercial Oregonn ash removal and brush mowing in oak woodlands.

Fuels management along property lines

Before

After

Changes on the North Unit

Pre-treatment

Two years after treatment

Federally threated Mazama pocket gopher and rare butterfly use of commercially thinned areas within 6 months

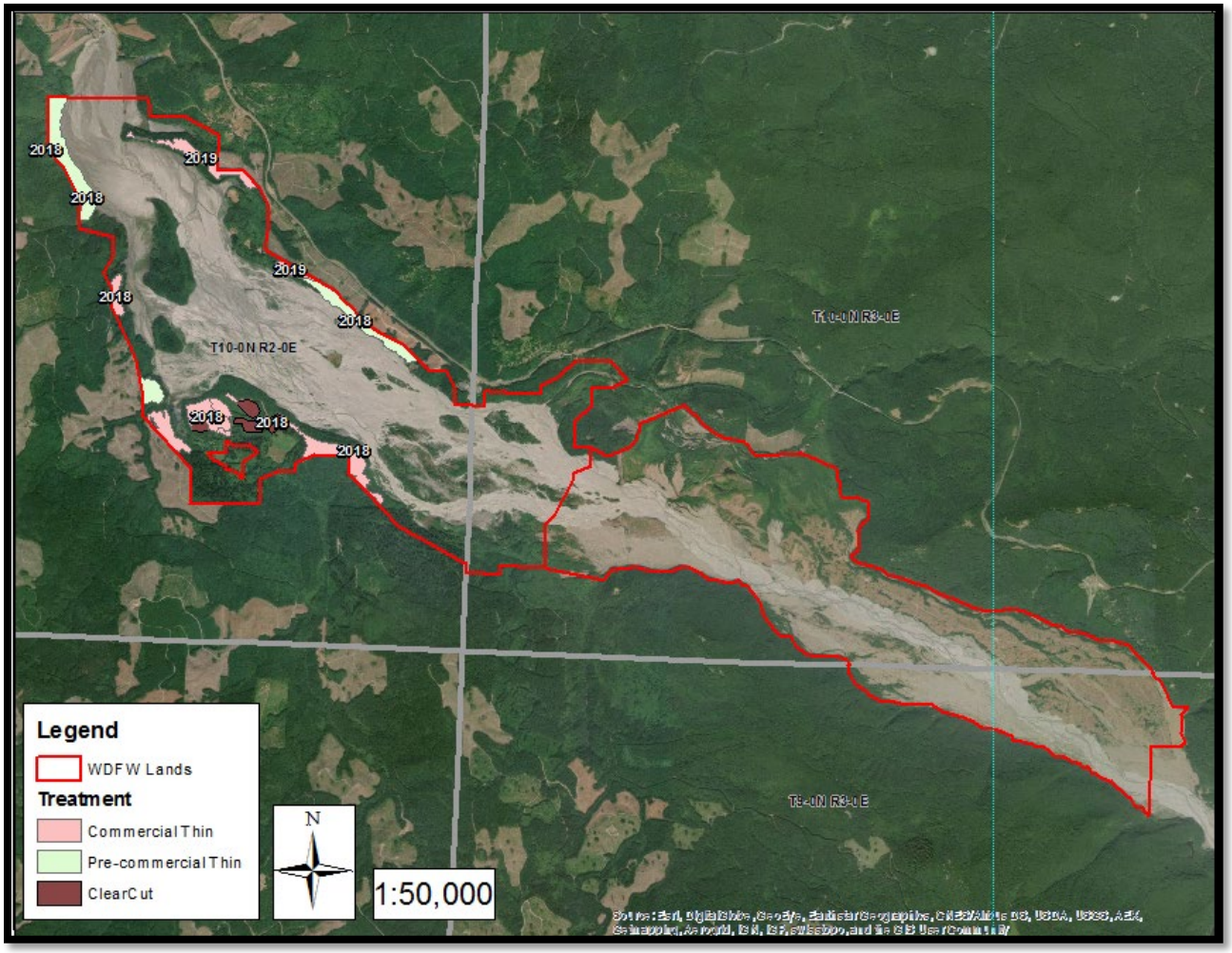
Mount Saint Helens (Cowlitz County)

Problems: Overstocked plantations will become stunted unless thinned. Limited forage for game species like elk. Low amounts of mature forests in a largely industrial timber production landscape.

Goals: Accelerate tree growth, increase structural/species diversity and increase forage for wildlife.

Goals accomplished (2018-2019): Reduced fuel load, removed fuel ladders, increased growing space for dominant trees and increased understory vegetation/wildlife forage.

- 257 acres of commercial thinning (Supported with Federal Pittman Robinson Funds)
- 160 acres of non-commercial thinning (Supported by the Rocky Mountain Elk Foundation)



Long term plans: Most forests will be left alone to mature naturally as the presumed historic condition was about 75% closed canopy, mature forest. A second thinning of thinned areas may occur in about 20 years to ensure rapid development of the desired future conditions (old growth) and create small openings for wildlife that depend on early seral conditions.

Before commercial thinning

After commercial thinning

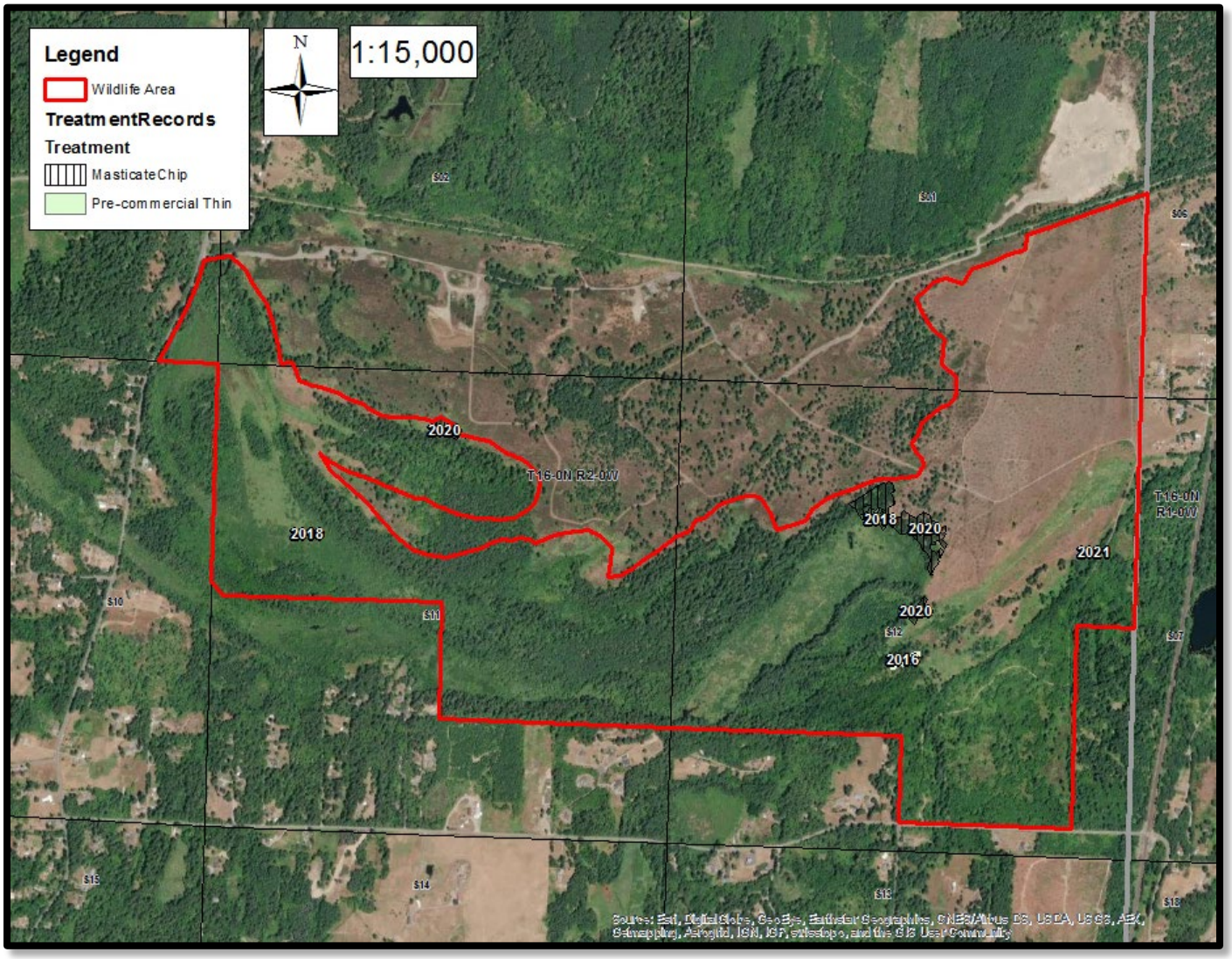
Before non-commercial thinning

After non-commercial thinning

Desired future conditions

West Rocky Prairie Wildlife Area Unit (Thurston County)

Problem: Without fire, Douglas fir shades out critically imperiled oak woodlands and prairies containing federally threatened species (butterflies and Mazama pocket gophers). Invasive scotch broom and blackberries also degrade oak woodlands ruining their value as listed species habitat as well as their value for recreation. Also, willows are shading out breeding habitat of Oregon spotted frogs.



Recent work:
2020 – Removing Scotch broom and blackberry from the understory of oak woodlands (8 acres)
2018 – Will removal from wet meadows to restore Oregon spotted frog habitat (1.25 acres)
2016 – Brush removal from oak woodlands (0.75)

Planned work: A 95-acre commerical thinning project to and acclerate succession of Douglas fir plantations to old growth forest, restore oak woodlands and restore prairie. Complete an additional 2.5 acres of willow removal to restore Oregon spotted frog habitat. Continue removing brush and Oregon ash fromn the understory of oak woodlands. Scotch broom will need to be continuously controlled in all restored areas.

Long term strategy: Maintain restored forests with prescribed fire to the degree feasible. Periodically mow and thin in areas where prescribed fire is not feasible.

Before Scotch broom control

After Scotch broom control

Untreated blackberry understory area

Treated blackberry area

Willow removal to restore Oregon spotted from habitat

Elk River Unit (Grays Harbor County)

Problem: Most forests had been logged prior to acquisition with some areas coming back as monotypic Douglas plantations and others as largely failed plantations that were dominated by invasive Scotch broom and Himalayan blackberry. Such conditions provide low quality deer and elk habitat. They also delay the development of old growth conditions that would support federally threatened marbled murrelets.

Recent work: 2021 – 108 acres of pre-commercial thinning and noxious weed control with a masticator.

Accomplishments: Treated areas put on an accelerated trajectory towards more diverse, old growth conditions. Habitat improved for elk. Site immediately improved for hunting and other forms of recreation.

Planned work: A 110-acre pre-commercial thinning project to and acclerate succession of Douglas fir plantations to old growth forest.

Long term strategy: Thin overstocked young forests as needed to accelerate development of old-growth forest conditions.

2021
Examples of pre-treatment conditions

Scotch broom and blackberry

Scotch broom trunk for scale

Excessively dense conifers

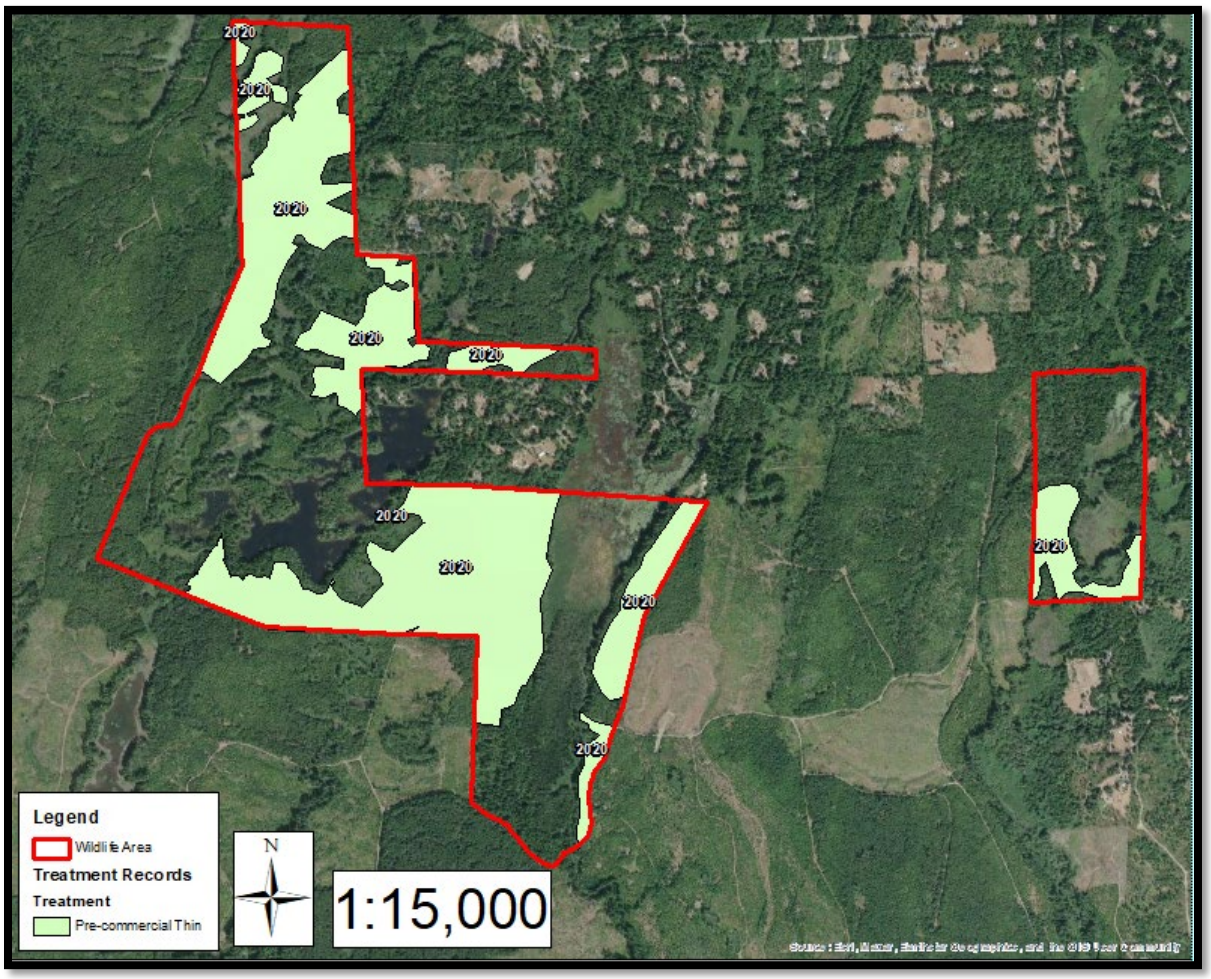
2021
Treated areas immediately after thinning and weed control.

South Puget Sound Wildlife Area – Big Beef Creek Unit (Kitsap County)

Problem: Prior to acquisition, forests had been managed as dense, young Douglas fir plantations that lacked diversity. Also, stands were so overstocked that tree growth was becoming stunted.

Recent work: 2020 – Commercially thinned 266 acres of dense, young plantations.

Goals accomplished: Thinned forests are now on an accelerated trajectory towards mature forest conditions which are underrepresented on the Kitsap Peninsula. Douglas fir densities were reduced in favor of Madrone, white pine, western hemlock, lodgepole pine, Pacific dogwood and other species that are typically removed from plantations. Increased light now reaches the forest floor to encourage the return of Pacific rhododendron/evergreen huckleberry understory vegetation.



Untreated

Treated

Desired future condition

Averted future conditions

Near term plans: There are about 25 acres of additional plantations that are not yet old enough to thin. Those plantations may also need to be thinned in about five years.

Long term strategy: The pre-commercially thinned forests should be able to naturally progress towards old-growth conditions without further interventions.

Tarboo Unit - North Olympic Wildlife Area (Clallam County)

Problem: Prior to acquisition, forests had been managed as dense, young Douglas fir plantations that lacked diversity. Also, stands were so overstocked that tree growth was becoming stunted.

Recent work: 2020 – Commercially thinned 23 acres of dense, young plantations.

Untreated

Treated

Desired future condition

Goals accomplished: Thinned forests are now on an accelerated trajectory towards mature forest conditions. Douglas fir densities were reduced in favor of western red cedar, western hemlock, Sitka spruce, bigleaf maple and other species that are typically removed from plantations. Increased light now reaches the forest floor to encourage the development of diverse understory vegetation.

Long term strategy: The pre-commercially thinned forests should now be able to naturally progress towards old-growth conditions without further interventions.

A tree cross section showing how overstocking hinders growth and how important it is to thin overstocked stands.

- In years 1-7 this tree grew to 5.5 inches in diameter.
- In years 8-14 in gained 1.5 inches in diameter.
- In years 15-19 it gained only 0.5 inches in diameter.

Had the stand been thinned after seven years, this tree would have continued growing at the fast rate visible in years 1-7.

Glossary

Browse vegetation – Food that deer, elk, moose eat.
Commercial thinning – Thinning of trees that are big enough to have any commercial value (usually greater 7 inches in diameter or larger). Commercial logging is usually done with large equipment.

Fuel Ladders – Little trees and low branches and allow wildfires to climb up into the tops of trees. Methow project before and after removing fuel ladders

Fuel Load – The amount of fuel in a forest
Fuel Management – Removal of fuels from the forest (haul them away or burn them) or manipulation where they pose less risk. Examples of fuel manipulations: Pulling fuels away from the trunks of trees, cutting lower branches off of trees and putting them on the ground where they will rot more quickly, grinding up branches, etc.
Larch – Our native conifers (trees with cones) that drop their needles in the winter.

Non-commercial thinning – Thinning of trees that are too little to have any commercial values (usually greater 7 inches in diameter or larger). This usually entails people cutting trees down with trees chainsaws and letting them decompose on site.

Slash Piles – Piles of branches and other wood that can't be hauled to a mill for processing into lumber or paper.

Ungulates – Animals with hooves: Deer, elk etc.

Pulp wood – small defective logs that are made into paper because they aren't good enough to make lumber.