

STAFF REPORT

Agenda Item No.:	6
Work Plan:	State Forests
Topic:	State Forests Management
Presentation Title:	State Forests HCP: Response to Board Request for Information
Date of Presentation:	November 16, 2022
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CONTEXT

The Public Draft Habitat Conservation Plan (HCP) is a continuation of work at the direction of the Board to pursue programmatic solutions to Endangered Species Act (ESA) compliance and stability of harvest levels over a long-term planning horizon. The State Forests Division (Division) has had a Strategic Initiative for improvements to ESA compliance beginning in 2015, and the work to develop an HCP began in earnest with the application of a grant to support development of the HCP in March 2017. The Board directed the Division to move forward with the HCP project in November 2017. The Division has successfully implemented two programmatic ESA compliance approaches to-date.

- Safe Harbor Agreement for northern spotted owls on the Western Lane District associated with barred owl removal experiments, and
- Candidate Conservation Agreement with Assurances for Pacific fisher.

The HCP represents the largest effort yet, designed to provide long-term certainty associated with 17 species of fish and wildlife across all the lands that the Division manages west of the crest of the Cascades.

In October 2020, the Board of Forestry (Board) directed the Division to complete the National Environmental Policy Act (NEPA) process for a possible HCP for Western Oregon State Forests as a method to comply with the ESA, while allowing for operational certainty over a 70-year permit term. National Oceanic and Atmospheric Administration (NOAA) Fisheries – the NEPA Lead Agency – in coordination with the US Fish and Wildlife Service (USFWS) completed the first phase of the NEPA process (Public Scoping) in spring 2021. NOAA Fisheries and USFWS (Services) launched the second phase by publishing the Notice of Availability of the Draft Environmental Impact Statement (DEIS) and the Public Draft HCP in the *Federal Register*, dated March 18, 2022. It was anticipated that the NEPA process would be completed by March 2023 in order to comply with NOAA’s requirement to complete the NEPA process in two years. However, NOAA requested, and was granted, a waiver to their timeline to accommodate their internal review process. This additional time is necessary solely for review of the Final Environmental Impact Statement (FEIS) based on the HCP as currently drafted. Any

potential modifications to the HCP would further extend the timeline in order to adjust the conservation actions of the HCP through the established process of working with the HCP Scoping Team and Steering Committee, which includes the Services and State partner agencies.

The federal NEPA process and associated EIS clarify current practices and the commitments in the HCP, and provide data requested by the federal agencies; however, ODF may not make changes to the EIS. As the applicant, ODF is responsible for producing an HCP that has a high probability of meeting incidental take permit issuance criteria.

BACKGROUND AND ANALYSIS

The National Environmental Policy Act requires that federal agencies consider the potential environmental effects of their actions, including effects on the human environment. The DEIS evaluates the broad environmental consequences of the Services' potential issuance of incidental take permits (ITPs) associated with the Western Oregon State Forests HCP. The DEIS presents effects of the proposed HCP and four alternatives on geology and soils, water resources, vegetation, fish and wildlife, air quality, aesthetics, recreation, cultural resources, Tribal resources, socioeconomics and environmental justice, and greenhouse gas emissions and carbon storage. The permits, if issued, would authorize take of the covered species that may occur incidental to ODF's otherwise legal forest management activities. Biological Opinions written by the Services determines the effects on the species covered by the HCP and are used as the basis for ITP issuance.

The Division has worked collaboratively with the Services and State agencies (Department of Fish and Wildlife, Department of Environmental Quality, and Department of State Lands) for over five years to integrate a diversity of technical and policy expertise to develop the HCP conservation actions designed to minimize and mitigate the effects on covered species. In addition to this collaborative process, the Division has implemented a transparent and inclusive public engagement process to integrate a diversity of perspectives in the HCP. Because of this rigorous and inclusive process, the Division is confident that the HCP is a sound approach to ESA compliance that will support a Forest Management Plan that will provide a blend of social, economic and environmental outcomes required by the Greatest Permanent Value mandate. The HCP provides high-quality habitat and durable conservation commitments for the covered species and ensures operational certainty and stability for management activities over the 70-year permit term.

The DEIS is a federal action that launched a public comment period (March 18 to June 1, 2022) for the DEIS and the Public Draft HCP. All public comment on the DEIS and the Public Draft HCP was accepted on [NOAA Fisheries website](#) and is available for public viewing. The Services are also working with ODF to provide responses to public comment on the Public Draft HCP. The Division presented a summary of the HCP public comment and responses at the Sept. 7th Board meeting, during which, the Board requested additional information and analysis to better understand the Draft EIS and potential outcomes of the HCP. Chair Kelly asked Board Members Ferrari, Justice, and McComb to work with the Division on this information request described below.

For the Proposed Action (HCP), Alternative 3 (increased conservation) and Alternative 5 (increased timber harvest), provide the following:

1. Modeled harvest volumes over the 70-year permit term
2. Modeled harvest volume from inside and outside Habitat Conservation Areas (HCAs)
3. Cumulative Net Present Value (NPV) analysis
4. Modeled cash flow analysis
5. Differences in risk to each covered species from the alternatives

Maps and other questions:

6. Spatial mapping showing HCAs and Riparian Conservation Areas (RCAs) overlaid on County, non-operable, alder and Swiss needle cast (SNC) restoration areas, current take avoidance acres (murrelet, Northern Spotted owl), and locations of old growth forests.
7. Where and how many steep slopes and landslide prone areas will be buffered (if Alt 3 were applied)
8. How risk to species would change or how assurance of achieving conservation outcomes would change if a longer historic period of record was utilized for determining large fire risk (to encompass Tillamook/Labor Day Fires) and/or if we assumed a greater future risk than the historic record (for purposes of changed circumstances)
9. The financial ramifications to ODF of having to manage road network
10. Differences in estimated need for additional analyses if an alternative other than the preferred alternative is chosen, and time associated with any additional analyses.
11. The economic analysis associated with the ecosystem services and the non-harvest related forest dependent economy (recreation/special forest products/commercial fishing/carbon) seems significantly less developed than the analysis associated with the harvest economy. Are there data and methodologies available that may allow for a more robust analysis?
12. Can the Department confirm (or not) the numbers presented to us by Wild Salmon Center at the September 2022 Board meeting concerning state forest contribution as a percentage of the region's total Gross Domestic Product or employment as well as the numbers associated with log supply (broken by private industrial v state forests, etc.) and harvest reduction/mill capacity.
13. What are the changes to habitat quantity and quality that are expected in the RCAs as a result of changed circumstances and how does that differ amongst alternatives (fire, disease etc.)? Can we expect those protections to be durable over time and does durability that would differ amongst alternatives?
14. Are there changes to conservation/economic outcomes if all known activity centers of marbled murrelets and NSO (those with breeding pairs) were included in HCAs?

The questions and requests for information from the Board of Forestry generally fit into three broad categories: economic, environmental, and process. The Division's responses in

this document are organized in this same way, recognizing there is often overlap and nuance. Maps that were requested are attached to the staff report separately as Attachments 3-12; however, there is context provided for some of the map information provided at the end of the attached report (Attachment 1). The *Proposed Action* may be referred to as *Alternative 2* or the *HCP*. Table and figure numbers correspond to the table and figure numbers in Attachment 1.

ECONOMIC

Modeled Harvest Volumes

- Modeled harvest volumes should not be considered actual harvest targets, and are for comparative purposes only.
- The harvest volume (million board feet per 10-year period) and revenue for the HCP and alternatives 3, and 5, were modeled for 100 years and reported by county for the 70-year permit term.
- **Error! Reference source not found.** shows that the harvest volume and revenue trends downward across the HCP and alternatives 3 and 5.
- The decline is in part due to the effect of imposing a Net Present Value (NPV) objective, which front-loads harvest of older stands with higher monetary value and regenerates them with faster growing stands.
 - As a result, harvest levels decline through the 70-year permit term before ultimately recovering back to the higher, initial levels toward the end of the 100-year modeling period.

Modeled Harvest Volumes Inside and Outside Habitat Conservation Areas (HCAs)

- Figure 2 shows that harvest levels inside and outside HCAs follow the same trends across the 3 alternatives.
- For the first 3 decades, the harvest levels inside the HCAs are over 200 mmbf, but drop substantially for the remaining decades
- Habitat enhancement activities in SNC stands, alder stands, and healthy conifer stands within HCAs is conducted earlier in the permit term to achieve biological goals and objectives over the permit term.

Cumulative Net Present Value Analysis

- Figure 3 shows the NPV (in 2022 dollars) for each alternative is approximately \$1.5 billion.
- NPV is calculated from net disbursements to counties and estimated net proceeds to Common School Forestlands.
- Alternative 5 is the highest and Alternative 3 is the lowest, which is directly correlated to their respective harvest levels.
- NPV does not account for non-timberland management investments (e.g., recreation benefits, ecosystem services).

Modeled Cashflow Analysis

- Cashflow is slightly higher for alternative 5 and declines through the 70-year permit term, consistent with harvest levels

- Reforestation costs were estimated by the model but are not deducted from the Forest Development Fund (FDF) revenue in Figure 4. Other division expenditures were not accounted for in the model.
- More restrictive even-flow constraints would have likely resulted in lower initial cashflow and overall lower net present value.

Financial Ramifications of Road Network Management Across Alternatives

- There is no difference among the alternatives related to financial ramifications of managing the road network.
- The road network will be maintained under all alternatives, and decisions on maintenance, vacating, and improvement needs will be made on a case-by-case basis.

State Forests' Percent Contribution to Forest Economies by County (GDP)

- It is currently not possible to determine the specific contribution of harvest from State Forests to GDP at the county level, but the proportion of State Forests harvest to total county harvest can be determined.
- Table 1 Shows that harvest from State Forests accounts for 44% of the total harvest in Tillamook County, 33% of the total in Clatsop County, and 29% of the total in Washington County (2013 – 2020).
- All other counties are less than 10%.

ENVIRONMENTAL

Relative conservation value to species under Alternatives 3 and 5 as compared to the Proposed Action (HCP)

- Please note that ODF cannot answer the risk to species question; risk to species would be provided in the Services' Section 10 Findings and Biological Opinions for each covered species for the Proposed Action (HCP) only.
- For context, the HCAs were designed to conserve and develop durable habitat for covered species based on (more detail provided in Attachment 1):
 - Species occurrence data.
 - Existing habitat.
 - Modeled habitat outcomes.
 - Landscape function.
- Increased management in HCAs will increase short-term risks to covered species.
- Reduced habitat in HCAs reduces short- and long-term conservation values to covered species (**Error! Reference source not found.**).

Table 4. Relative conservation value to species under Alternatives 3 and 5 compared to the HCP.

Covered Species	Relative Conservation Value to Species Compared to HCP	
	Alternative 3	Alternative 5
Northern Spotted Owl	Higher	Lower
Marbled Murrelet	Higher	Lower
Red Tree Vole	Higher	Lower
Oregon Slender Salamander	Higher	No Change
Coastal Marten	Higher	No Change

Change to conservation/economic outcomes if all known activity centers of marbled murrelets and NSO (those with breeding pairs) were included in HCAs.

- One small 29-acre Marbled Murrelet Management Area in West Oregon District
- Inclusion in HCAs would cause minor but not insignificant changes to economic outcomes from management, operational, and marketing perspectives.
- Three Northern Spotted Owl Activity Centers
 - Granite (West Oregon District)
 - Inclusion in HCAs would likely improve conservation outcomes for Red Tree Vole (RTVs). Murrelets have not been detected in this part of the district though some suitable habitat hasn't been surveyed recently.
- Butte Creek (North Cascade District)
 - Economic impacts would be significant at the county and district levels if the remaining 2,200 acres were added to the HCAs.
- Dutch Creek (West Oregon District)
 - Inclusion would not significantly improve conservation outcomes for spotted owls, but would for RTV
 - Economic impacts would be minor but not insignificant at the county and district levels if the 980-acre parcel was added to the HCAs

Where and how many steep slopes and landslide prone areas would be buffered if Alternative 3 were applied?

- ODF used the synthetic stream layer to identify those with potential to deliver large wood, gravel, sediment, etc. This provides a visual representation showing potential locations that would require additional buffers under Alternative 3 (Figure 6).
 - Within the permit area, an estimated 33.6% of the stream network has potential to deliver to fish streams.
- A graphic representation of the difference in the Proposed Action (HCP) and Alternative 3 is shown in Figure 7.

What are the potential changes to water yield/timing under each alternative

- The HCP included an analysis to identify HUC 10 watersheds, by ESU, or group of ESUs, that could experience elevated peak flows associated with timber harvest (stands <10 years old) in the permit area.
- The largest percentage of the permit area within the OR Coast Coho ESU occur in the following HUCs: Kilchis River (82%), Wilson River (79%), Lower Nehalem River (79%)
 - None of these HUCs approach or exceed the 20% threshold using the buffers in the HCP, and Alt 5 (same as HCP), or Alternative 3 scenarios.

What are the changes to habitat quantity and quality that are expected in the RCAs as a result of changed circumstances and how does that differ among alternatives (fire, disease, etc.)? Recognizing that the RCA protections do not change, are those protections expected to be durable over time and would the durability differ among alternatives.

- No significant difference among Alternatives.
- RCAs are designed to be resilient and provide durable protection to covered aquatic species through the permit term.
- Thermal sensitivity modeling was conducted to ensure all streams with potential for thermal loading are protected by RCAs.

PROCESS

Describe the differences in estimated need for additional analyses if an alternative other than the preferred alternative is chosen, and time associated with any additional analyses.

Attachment 2 contains the response from Joe Zisa, Senior Fish and Wildlife Biologist with the U.S. Fish and Wildlife Service on modifying a proposed HCP.

Generally, the economic analysis associated with the ecosystem services and the non-harvest related forest dependent economy (recreation/special forest products/commercial fishing/carbon)

A more robust socioeconomic analysis will be presented with the FMP modeled outcomes.

How risk to species would change or how assurance of achieving conservation outcomes would change under each alternative if a longer historic period of record was utilized for determining large fire risk (to encompass Tillamook/Labor Day Fires) and/or or if we assumed a greater future risk than the historic record (for purposes of changed circumstances)?

Differences in outcomes due to disturbances among alternatives are not substantial enough to result in significant differences in risk to species.

RECOMMENDATION

Information only.

NEXT STEPS

Over the next several months, the Division will:

- Provide the Draft FMP and the anticipated modeled outcomes from FMP and HCP implementation to the Board in Summer 2023.
- Complete the NEPA process in July 2023.
- Receive Board direction on whether to implement the HCP and the terms of the Incidental Take Permits in September 2023.
- Continue engaging with our state and federal partner agencies, as well as, the county partners, Tribes, interested stakeholders and members of the public on the HCP and draft FMP and Implementation Plan development projects.

ATTACHMENTS

1. Responses to Board Questions
2. Letter from Joe Zisa, Senior Fish and Wildlife Biologist, USFWS
3. Overlap Map – Northern Region
4. Overlap Map – Astoria District
5. Overlap Map – Tillamook District
6. Overlap Map – Forest Grove District
7. Overlap Map – North Cascades District
8. Overlap Map – West Oregon District
9. Overlap Map – Western Lane District
10. Overlap Map – Coos Unit, Western Lane District
11. Overlap Map – Southwest Unit, Western Lane District
12. Overlap Map – Southwest Unit Area 2, Western Lane District

The questions and requests for information from the Board of Forestry generally fit into three broad categories: economic, environmental, and risk and process. The Division's responses in this document are organized in this same way, recognizing there is often overlap and nuance. Maps that were requested are attached to the staff report separately as Attachments 3 - 12; however, there is context provided for some of the map information provided at the end of this report. Throughout this document, the *Proposed Action* may also be referred to as *Alternative 2* or the *HCP*.

Economic

Modeled harvest volume and modeled harvest volume inside and outside Habitat Conservation Areas (HCAs)

- The volumes presented here should only be used for comparative or relative purposes.
- The volume outcomes are based on modeling done in 2020 for the Comparative Analysis.
- Modeling was subsequently used by the Federal Services for the EIS.
- Important to note that the FMP/HCP outcomes analysis will include new inventory data and different model parameters including the FMP management approach (to be presented to the Board in Summer 2023), which differs from what is presented here.
- The modeled decadal harvest volume (million board feet (mmbf) per 10-year period) for Alternatives 2, 3, and 5, for the permit term (70 years) is shown in Figure 1 **Error! Reference source not found.**
- Harvest inside and outside HCAs for Alternatives 2, 3, and 5 is shown in Figure 2.
- Harvest levels were modeled for 100 years. Modeled outcomes are reported for the 70-year permit term (2088) for all three alternatives, by county.

Key model constraints

- Harvest volume was constrained regionally, with 75% of annual harvest volume coming from north coast districts. This was imposed to ensure a regional supply of timber similar to recent trends.
- Annual harvest volume could deviate by no more than 5% period-to-period, and must remain within 10% of the long-term average. These even-flow constraints were used to maintain a predictable rate of harvest. They are also in place to ensure that the pace of geographic shifts in harvest are manageable for agency resources and personnel.
- More restrictive even-flow constraints would result in a lower overall Net Present Value (NPV) and likely lower initial harvest.
- Ending age class distribution outside of HCAs, but including RCAs and other inoperable areas: 30% (0-30); 30% (31-60); 40% (61+).
- Ending inventory on operable ground averaging 20 thousand board feet (mbf) per acre.
- The age class and inventory constraints are in place to help ensure a sustainable harvest could be perpetuated beyond the model period. The age class distribution does not prescribe a "rotation age" as the model was allowed to harvest older or younger stands to meet other constraints and achieve a high NPV.

Modeled Harvest Outcomes

- All scenarios were modeled with an objective to maximize NPV using a discount rate of 3%.
- Consequently, they all follow a similar trend, with differences relative to the size and location of alternative constrained areas.
- The effect of an NPV goal is that the model will select stands for harvest that are not growing faster than the discount rate and regenerate them with stands that will grow faster in the future.
- This generally means harvesting older mature or decadent stands sooner rather than later, subject to constraints described below. The trend toward a younger average age outside of HCAs is depicted in Figure 3.
- As a result, harvest levels decline through the 70-year permit term before ultimately recovering back to the higher initial levels (not shown in Figure 1 as the recovery occurs beyond the permit term). The timing of the effect is coincidental, as there are no constraints imposed related to the end of the permit term.

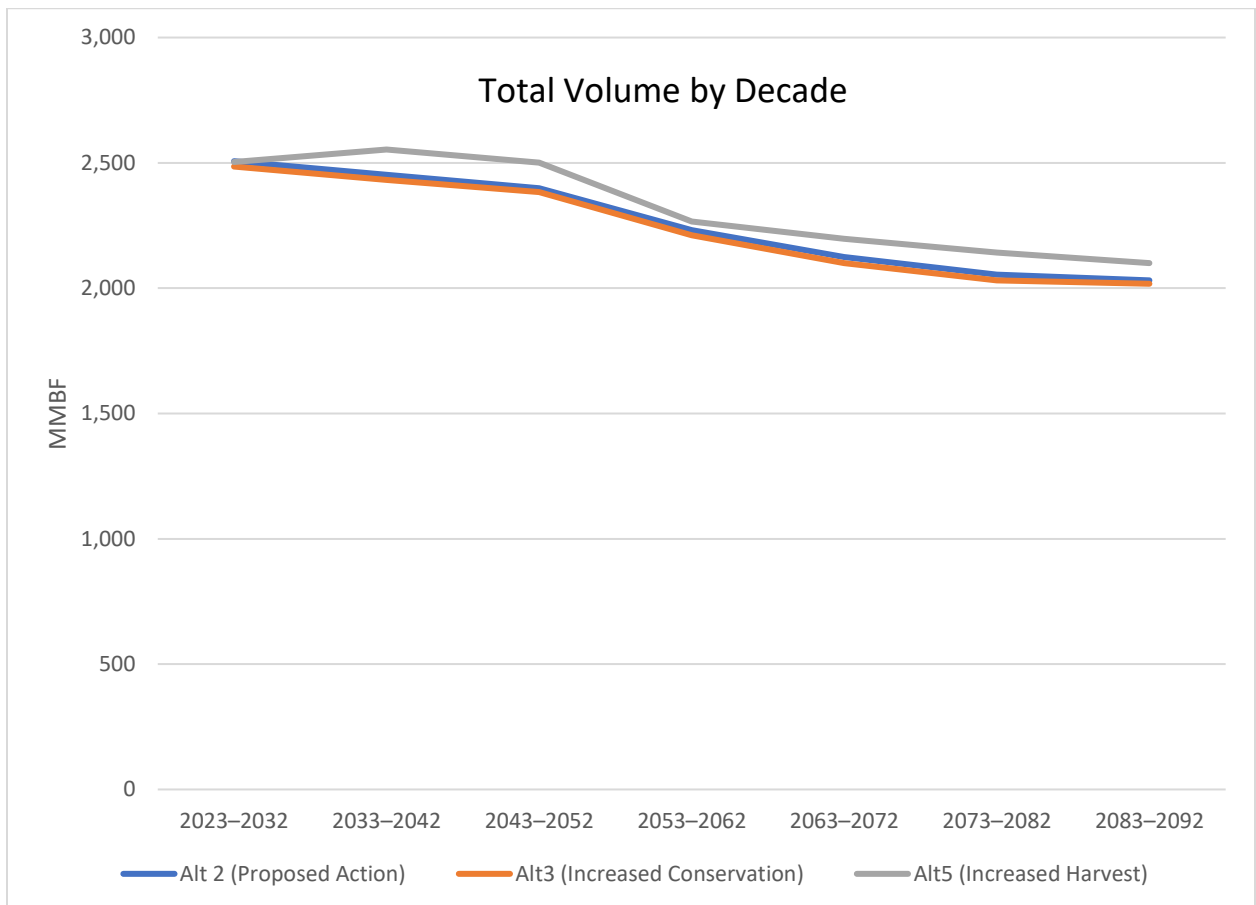


Figure 1. Modeled harvest volume by decade under the three alternatives. Timber volume sold and scaled in fiscal years 2013-2022 and the current Implementation Plan objective is also shown.

Responses to the Board’s Information Requests

Modeled Harvest Volumes Inside and Outside HCAs

- Harvest levels inside and outside the HCAs follow the same trends across the 3 alternatives (Figure 2).
- Across all time periods, the harvest levels outside HCAs are stable and are over 2,000,000 mbf.
- For the first 3 decades, the harvest levels inside the HCAs are over 200,000 mbf, but drop substantially for the remaining decades.
- This is due to attaining habitat commitments inside the HCAs.
- Swiss needle cast and Alder restoration, and healthy conifer thinning is conducted earlier in the permit term to achieve biological goals and objectives over the permit term.

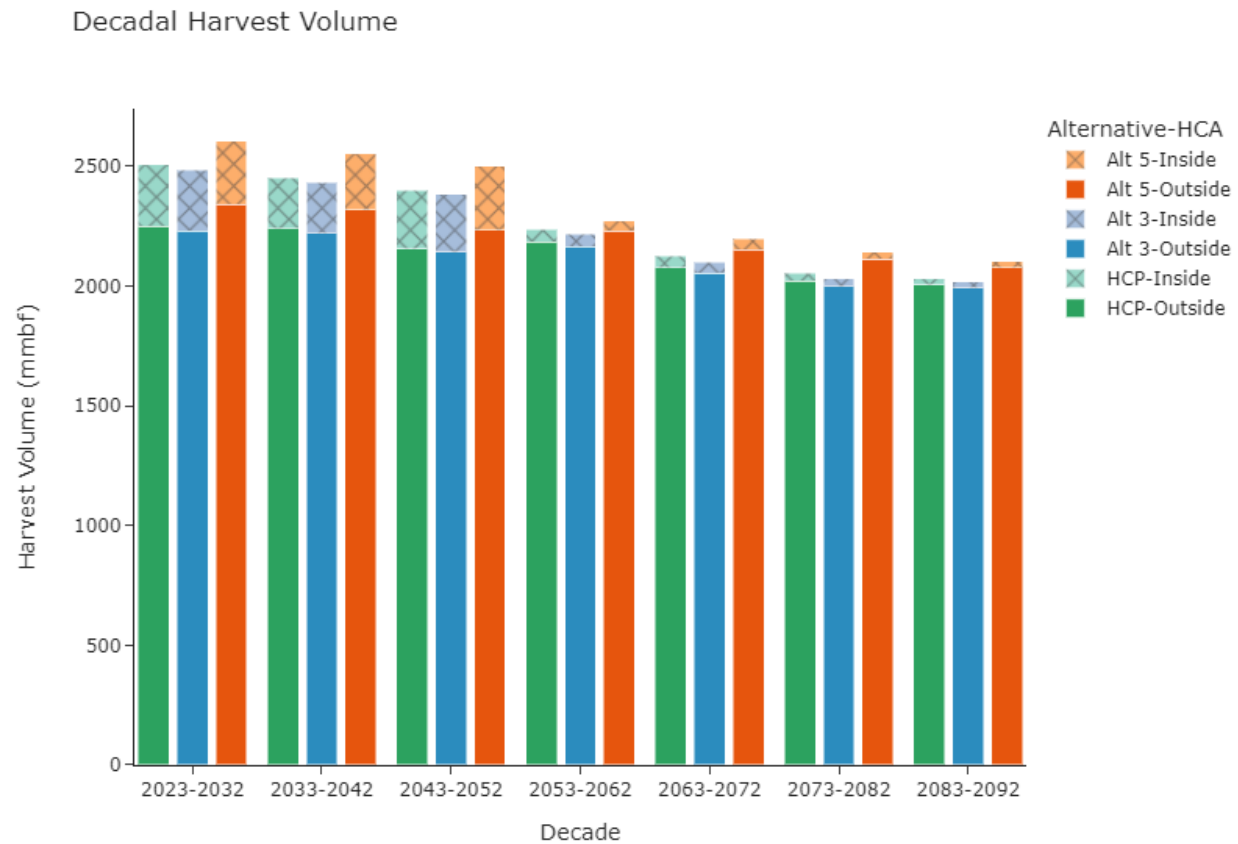


Figure 2. Decadal harvest volumes inside and outside the HCAs for the HCP, Alternative 3, and Alternative 5.

Responses to the Board's Information Requests

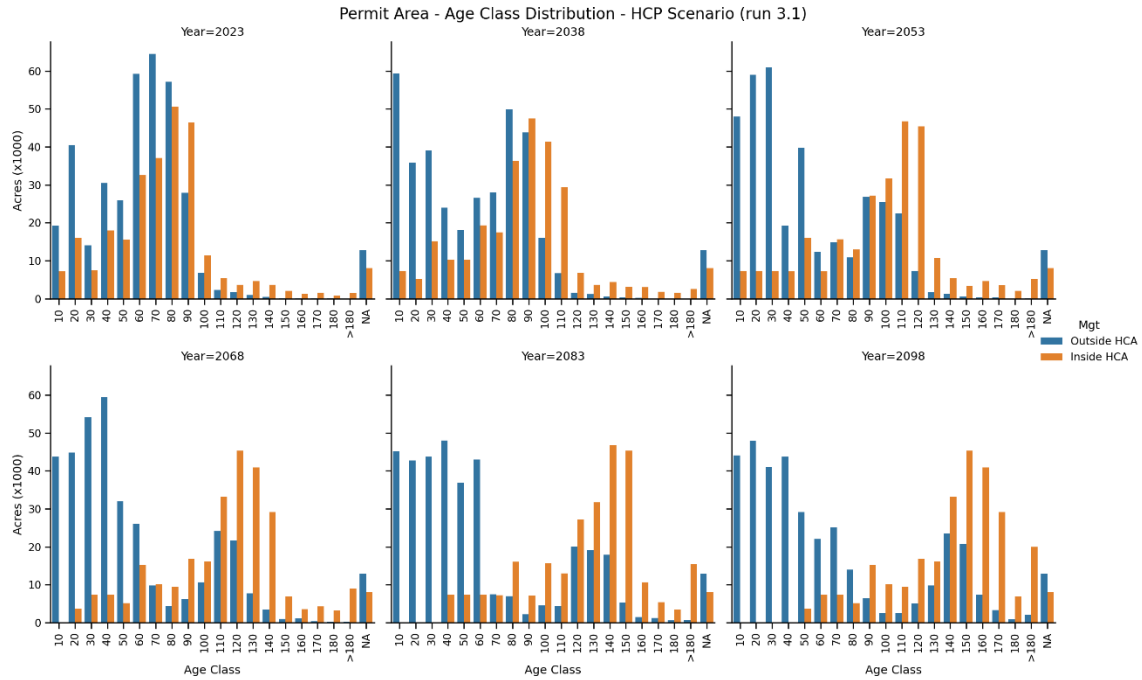


Figure 3. Age class distribution inside and outside HCAs from 2023 to 2098 for the Proposed Action (Alternative 2).

Cumulative Net Present Value (NPV) Analysis

- Net present value was calculated for each of the three alternatives using a 3% discount rate (Figure 4) using the net disbursements to the counties and estimated net proceeds to the Common School Fund and assume Common School Forest Lands (CSFL) costs are comparable to the 63.75% / 36.25% revenue split for Board of Forestry Lands (BOFL).
- The NPV (in 2022 dollars) for each alternative is approximately \$1.5 billion.
- NPV does not account for non-timberland management investments (e.g., recreation benefits, ecosystem services), so Alternative 5 is the highest and Alternative 3 is the lowest, directly correlated to their respective harvest levels.
- This analysis does not include road construction and upgrade costs.

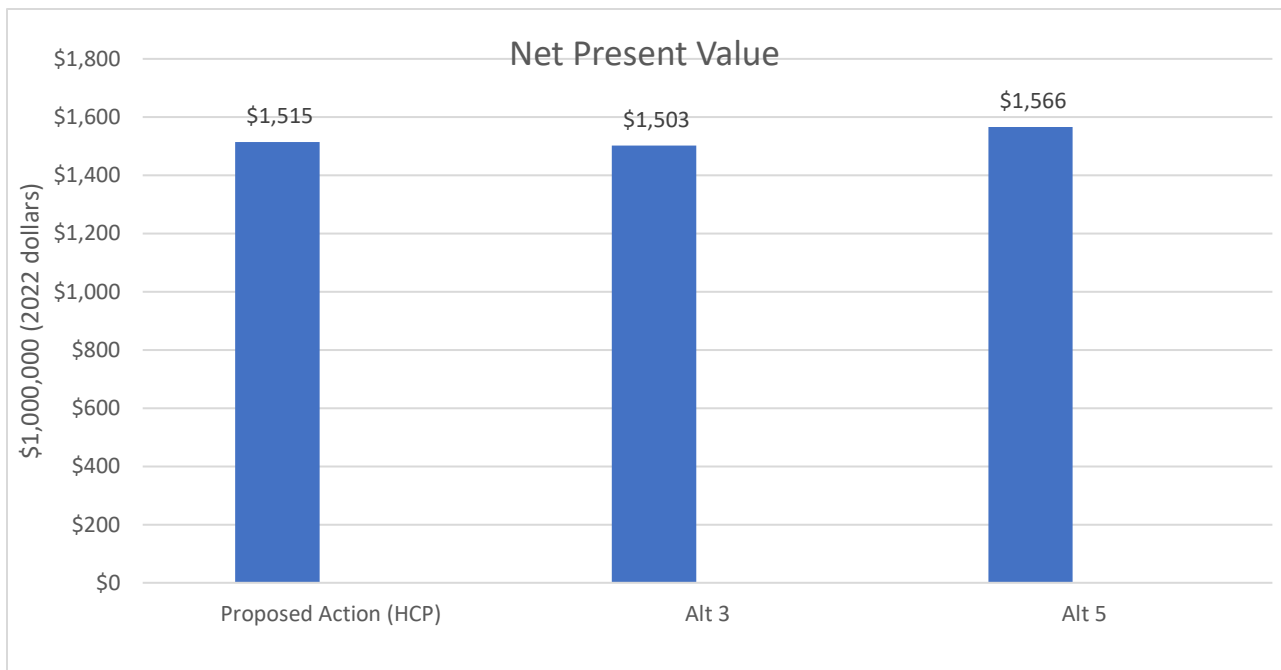


Figure 4. Net Present Value for Alternatives 2, 3, and 5 discounted to 2022 dollars using a 3% discount rate. Estimated Disbursements include BOFL & CSFL, and assume CSFL costs are comparable to the 63.75% / 36.25% BOFL revenue split. NPV does not account for non-timberland management investments (e.g., recreation, ecosystem services).

Modeled Cash Flow Analysis

- Nominal annual cash flow for the three alternatives over the permit term is shown in Figure 5.
- Nominal cashflow is a product of harvest. As such cashflow trends very similar to harvest for each scenario. Minor variations are due to the estimated value of delivered logs and harvest costs.
- Cashflow shown in Figure 5 is the sum of estimated county disbursements from BOFL land and estimated net proceeds derived from CSFL land.
- For purposes of this analysis, it is assumed that CSFL costs are consistent with the 36.25% share retained from BOFL gross receipts.
- Note that road construction and upgrade costs were not modeled and would reduce the net revenue.

Responses to the Board’s Information Requests

- As with harvest levels cashflow is a bit higher for alternative 5, and only slightly lower for alternative 3, compared to the proposed alternative.
- Also, cashflow declines through the permit term as the model harvest higher value stands early on to maximize NPV. Cashflow recovers beyond the permit term consistent with the modeled harvest levels.
- A more restrictive even-flow constraint would have likely resulted in a lower initial cashflow and lower overall NPV.

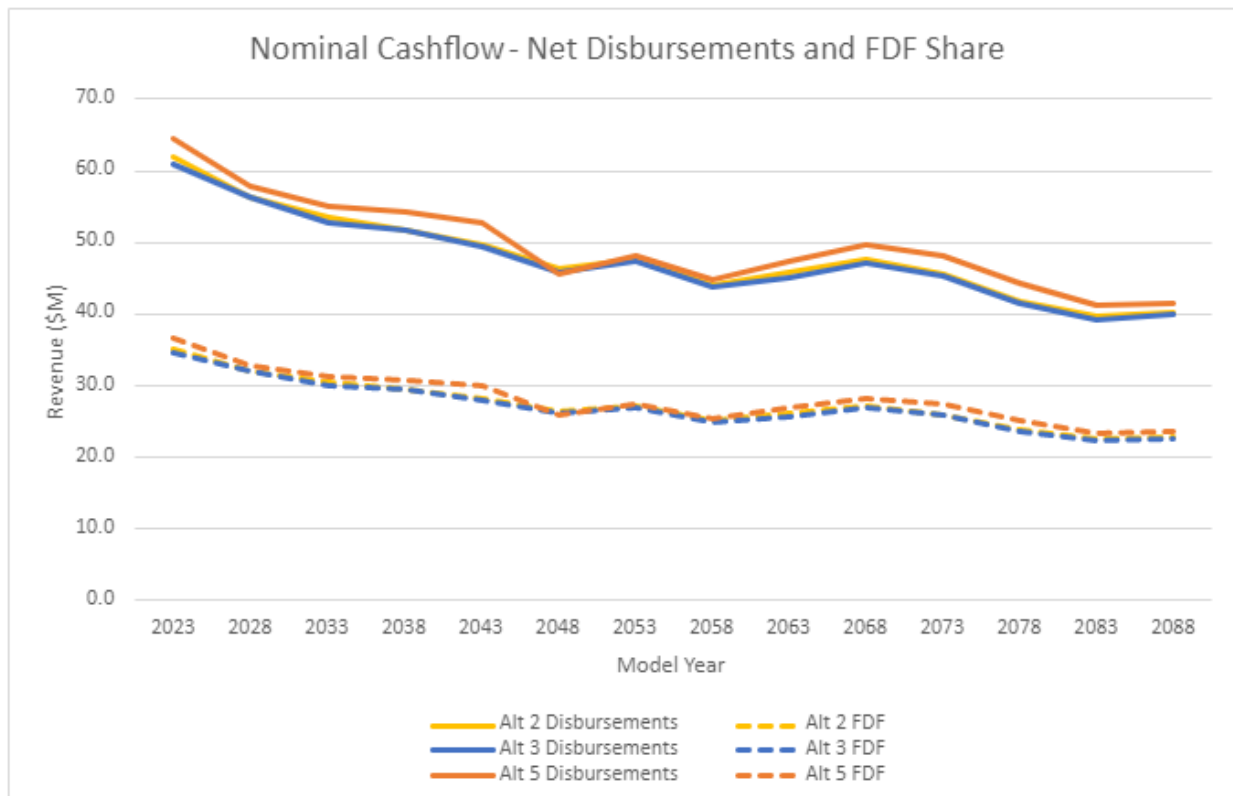


Figure 5. Nominal Annual Cash Flow for Alternatives 2, 3, and 5. Values shown are the averages for each 5-year modeling period. Includes BOFL & CSFL and assumes CSFL costs are comparable to the 63.75% / 36.25% BOFL revenue split. The amount of revenue accruing to the Forest Development Fund (FDF) is shown with dashed lines, while the amount distributed to the counties is shown with solid lines.

The financial ramifications to ODF of having to manage road network

- There is no difference between the alternatives related to financial ramifications of managing the road network.
- The road network will be maintained under all alternatives, and decisions on maintenance, vacating, and improvement needs will be made on a case-by-case basis.

Can the Department confirm (or not) the numbers presented to us by Wild Salmon Center at the September 2022 Board meeting concerning state forest contribution as a percentage of the region's total Gross Domestic Product or employment as well as the numbers associated with log supply (broken by private industrial vs state forests, etc.) and harvest reduction/mill capacity.

- The State Forests’ proportion of total timber harvest is shown in Table 1.
- From 2013 – 2020, State Forests’ harvest accounted for 44% of the total harvest in Tillamook County, 33% of the total in Clatsop County, and 29% of the total in Washington County.
- All other counties are less than 10%.
- A comprehensive log-flow model would have to be developed to determine the impacts on county-level GDP.
- State Forest timber sales may be purchased by mills outside of the county of harvest, and contractors cutting the timber, building the roads, and hauling the logs also come from a regional labor pool.

Table 1. State Forests' proportion of total timber harvest in each of the fourteen counties with State Forest lands that would be subject to the HCP.

County	% ODF of Total Harvest (2013 - 2020)
Benton	3%
Clackamas	1%
Clatsop	33%
Columbia	2%
Coos	0%
Douglas	0%
Josephine	1%
Lane	2%
Lincoln	4%
Linn	5%
Marion	9%
Polk	0%
Tillamook	44%
Washington	29%

Environmental

Risk to Each Covered Species in Alternatives 3 & 5 as compared to the HCP

- Please note that ODF cannot answer the risk to species question; risk to species would be provided in the Services’ Section 10 Findings and Biological Opinions for each covered species for the Proposed Action (HCP) only.

Proposed Action (HCP)

- The [HCAs were designed](#) to conserve and develop durable habitat for covered species based on:
 - Species occurrence data.
 - Existing habitat.
 - Modeled habitat outcomes.
 - Landscape function.

Alternative 3 – Increased RCAs

- HCAs remain the same. No effect on habitat inside HCAs.
- Additional stream buffers increase modeled habitat outside HCAs at the end of the permit term (Table 2).
 - Limited to upslope areas within harvest units.
 - Minor uptick in connectivity.
 - Lower take of Oregon slender salamanders and red tree voles.

Table 2. Comparison of Proposed Action (HCP) and Alternative 3 (Increased RCAs) covered species habitat acres inside and outside of HCAs at the end of the permit term.

Species	Inside HCAs	Total Habitat		
	No Change	Alt. 2	Alt. 3	% Increase
Spotted Owl	249,000	340,000	343,000	1
Marbled Murrelet	210,000	275,000	280,000	2
Red Tree Vole	196,000	260,000	262,000	1

Alternative 5 – Reduced HCAs and increased management in HCAs (Table 3).

- ODF compared the HCAs in the HCP to the adjusted HCA boundaries developed by the NEPA Team.
 - 23,500 acres of average or better timber production value removed from HCAs.
 - 8,000 acres of low production value added to HCAs.
 - Net reduction of 15,500 acres.

Responses to the Board’s Information Requests

- Less modeled habitat inside HCAs (and more outside HCAs) at the start of the permit term.
- Less modeled habitat inside HCAs at the end of the permit term.

Table 3. Comparison of Alternative 2 (Proposed Action) and Alternative 5 (Reduced HCAs) covered species habitat acres inside HCAs.

	Inside HCAs - Start of Permit Term			
	HCP	Alternative 5	Net Decrease	% Decrease
Spotted Owl	123,000	114,000	9,000	7
Marbled Murrelet	47,000	43,000	4,000	9
Red Tree Vole	72,000	66,000	6,000	8
	Inside HCAs - End of Permit Term			
	HCP	Alternative 5	Net Decrease	% Decrease
Spotted Owl	249,000	232,000	17,000	7
Marbled Murrelet	210,000	193,000	17,000	8
Red Tree Vole	196,000	179,000	17,000	9

- Landscape function
 - Reduced interior habitat areas in modified HCAs.
 - Increased edge in modified HCAs.
 - Reduced connectivity among HCAs
- Localized effects
 - Reductions focused on North Coast.
 - Most substantial on the east side of Tillamook State Forest and portions of Clatsop State Forest.
- Alternative 5 also increases management activities inside HCAs.
 - Allows for an additional 6,000 of harvest of Swiss needle cast-infested stands (increase from 27% to 30% of HCAs).
 - Increased management in HCAs will increase short-term risks to covered species.
- Reduced habitat in HCAs reduces short- and long-term conservation values to covered species (Table 4).

Table 4. Relative conservation value to species under Alternatives 3 and 5 compared to the HCP.

Covered Species	Relative Conservation Value to Species Compared to HCP	
	Alternative 3	Alternative 5
Northern Spotted Owl	Higher	Lower
Marbled Murrelet	Higher	Lower
Red Tree Vole	Higher	Lower
Oregon Slender Salamander	Higher	No Change
Coastal Marten	Higher	No Change

Change to conservation/economic outcomes if all known activity centers of marbled murrelets and Northern Spotted Owls (NSO) (those with breeding pairs) were included in HCAs.

- Marbled Murrelet Management Area (MMMA) (29 acres) (West Oregon District).
 - 5.5 acres Designated Occupied Habitat and 23.2-acre Buffer.
 - Designated Occupied Habitat is 10 – 15 leave trees from previous harvest, would be retained under Conservation Action 8.
 - Large HCA with 3 large MMMA ½-mile to the east.
 - Inclusion would not significantly improve conservation outcomes.
 - The buffer fractures multiple younger stands with different management histories.
 - Inclusion would cause minor but not insignificant changes to economic outcomes from management, operational, and marketing perspectives.
- Three Northern Spotted Owl Activity Centers:
 - Granite (West Oregon District)
 - Resident Single site with observations from 2008 – 2015.
 - Of the approximately 4,500 acres in the 1.5-mile-radius provincial home range, just under 3,000 acres (66%) are on ODF-managed lands. Of these, approximately 720 acres are in HCAs (24% of ODF-managed lands in the home range). One HCA is immediately adjacent to the activity center.
 - Most of the remaining lands are privately-owned (1,386 acres, 31% of total). Federal lands do not contribute significantly (136 acres, 3% of total range).
 - NSOs will still benefit from HCAs, though not managing as an active site at start of the term. Red tree voles likely present and would be impacted by harvest outside HCAs. Inclusion in HCAs would likely improve conservation outcomes for red tree voles. Murrelets have not been detected in this part of the district though some suitable habitat hasn't been surveyed recently.
 - Economic impacts would be significant at the county and district levels if the remaining 2,200 acres were included in HCAs.
 - Butte Creek (North Cascade District)
 - Resident Single site with observations from 2010 – 2014.
 - Of the approximately 2,900 acres in the 1.2-mile-radius provincial home range, just over 2,340 acres (81%) are on ODF-managed lands. Of these, approximately 560 acres are in HCAs (24% of ODF-managed lands in the home range). These HCAs are associated with two overlapping owl sites.
 - The remaining acres in the home range are on private lands (553 acres, 19% of total) and mostly too young to provide habitat for owls.
 - NSOs will still benefit from HCAs, though not managing as an active site at start of the term. Oregon slender salamander likely present and would be impacted by harvest outside HCAs. Inclusion in HCAs would likely improve conservation outcomes for Oregon slender salamander.
 - Economic impacts would be significant at the county and district levels if the remaining 1,780 acres were included in HCAs.
 - Dutch Creek (West Oregon District)
 - Pair site with observations from 2002 – 2014.
 - Failed nest attempt in artificial nest box in 2010.
 - Male last seen in 2012, Female last seen in 2014.

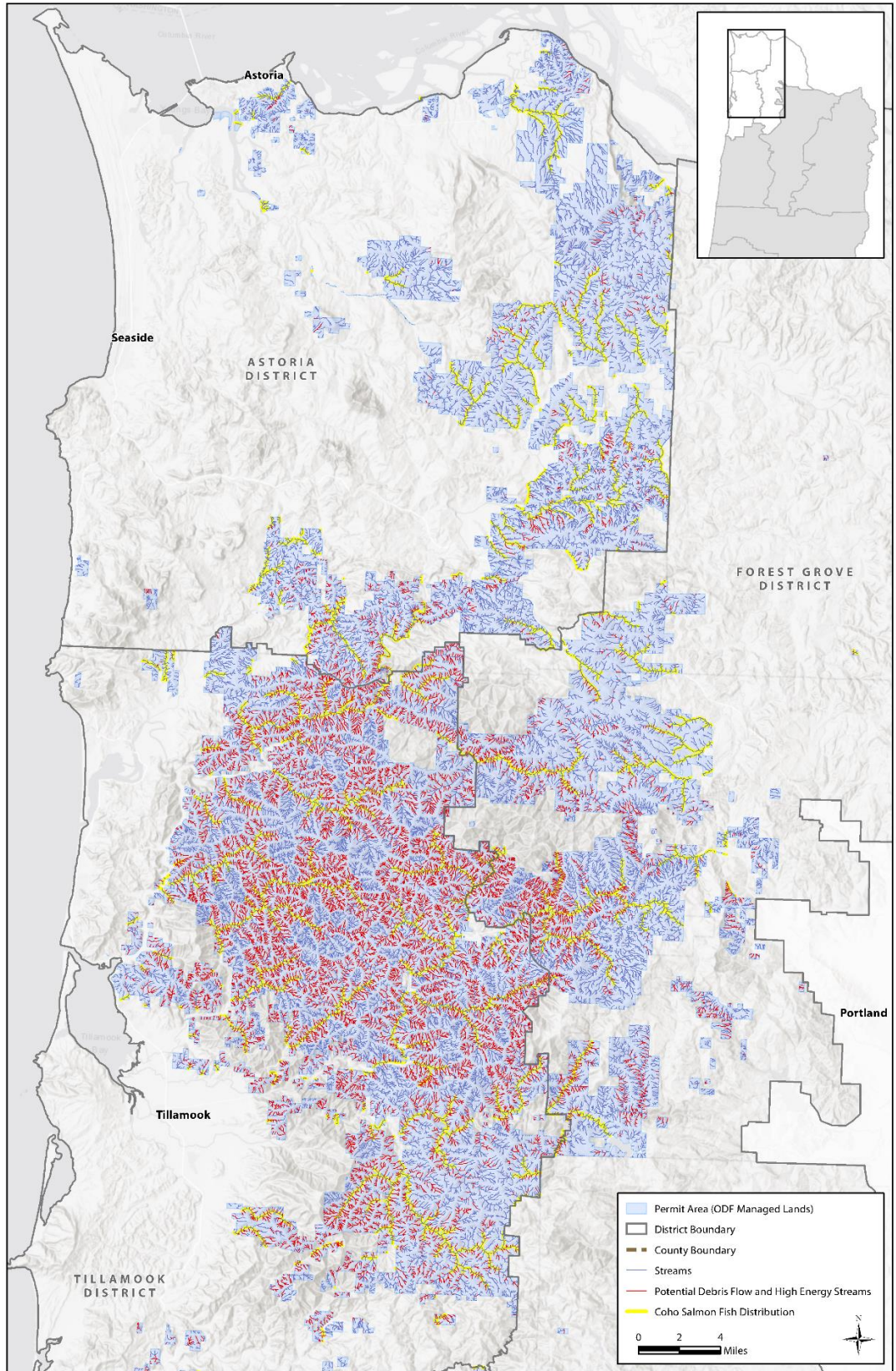
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- Of the approximately 4,500 acres in the 1.5-mile-radius provincial home range, just under 980 acres (22%) are on ODF-managed lands.
- Most of the remaining lands are privately-owned (3,486 acres, 77% of total). Federal lands do not contribute significantly (60 acres, 1% of total range).
- Inclusion would not significantly improve conservation outcomes for spotted owls. The parcel is isolated from other public lands and the home range has insufficient habitat. Red tree voles likely present and would be impacted by harvest outside HCAs. Inclusion in HCAs would likely improve conservation outcomes for red tree voles. Portions of parcel were surveyed for marbled murrelets from 1993 – 1995 and 2000 – 2002. Those surveys yielded a single presence detection in 2002, but no occupancy. BLM lands to the north and south provide broader landscape connectivity through this portion of the Coast Range.
- Economic impacts would be minor but not insignificant at the county and district levels if the 980-acre parcel was included in an HCA. This area hosts a popular mountain biking trail system and there would likely be potential conflicts with trail maintenance, further development, or increased use of the system.

Where and how many steep slopes and landslide prone areas would be buffered if Alt 3 were applied.

- ODF used the synthetic stream layer to identify those with potential to deliver large wood, gravel, sediment, etc. This provides a visual representation showing potential locations that would require additional buffers under Alternative 3 (Figure 6Figure 7).
- A graphic representation of the difference in the Proposed Action (HCP)and Alternative 3 is shown in Figure 7.
- Within the permit area, an estimated 33.6% of the stream network has potential to deliver to fish streams.

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Western Oregon State Forest HCP

Steep Slopes and Landslide-Prone areas, Astoria, Forest Grove, and Tillamook Districts



Figure 6. Potential debris flow and high energy streams that may need additional buffers under Alternative 3.

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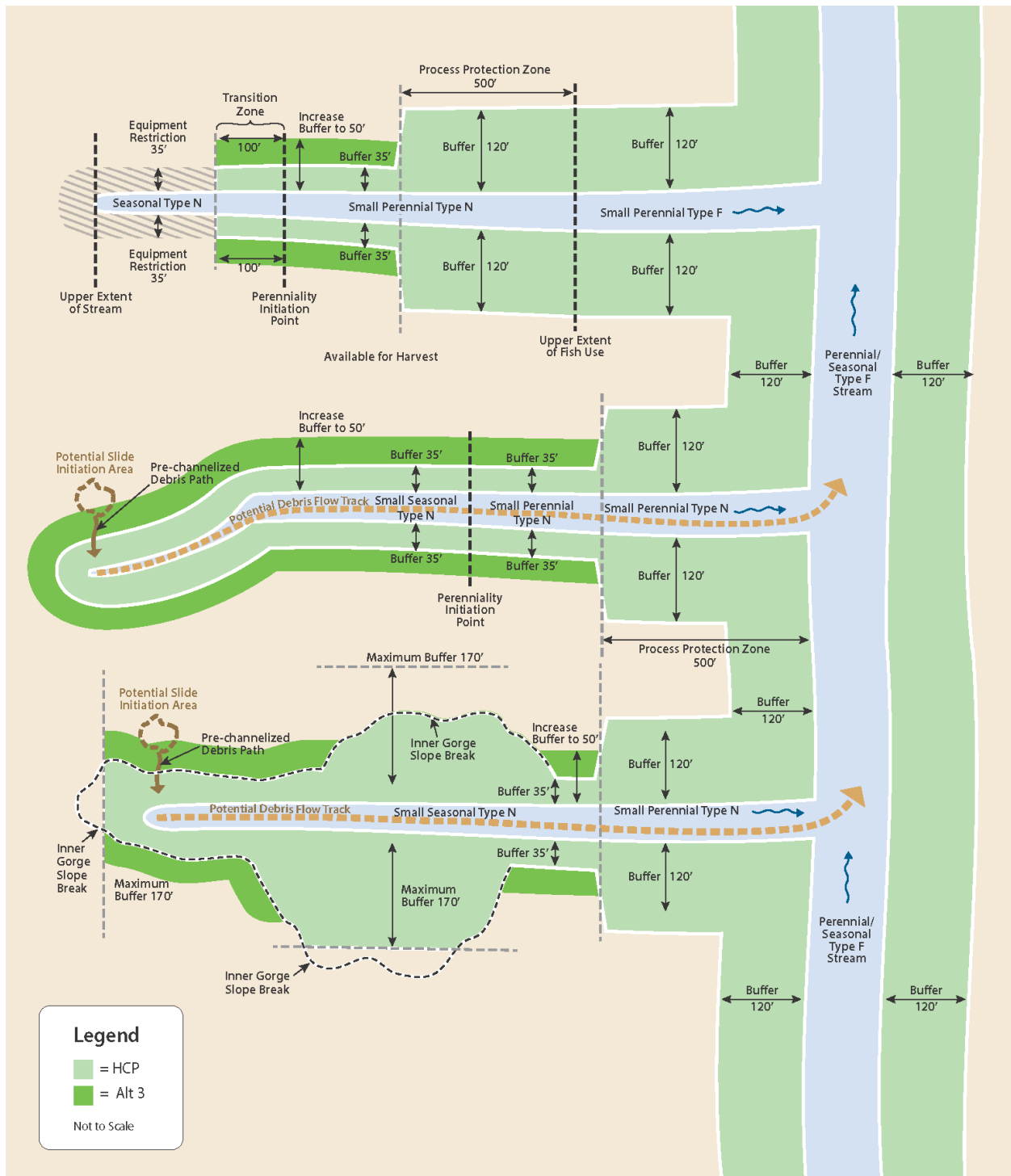


Figure 7. Visual representation showing potential locations that would require additional buffers under Alternative 3.

The potential changes to water yield/timing

- Under the HCP, RCAs will minimize most of the effects associated with harvest activities to the covered salmon and steelhead. However, harvest outside of the RCAs can contribute to changes in watershed processes under all alternatives.
- If more than 19–25% of a watershed is clearcut at any given time, elevated peak flows become measurable; however, these effects diminish as the watershed becomes larger (Grant et al. 2008, Stednick 1996).
- The HCP included an analysis to identify HUC 10 watersheds, by ESU, or group of ESUs, that could experience elevated peak flows associated with timber harvest (stands <10 years old) in the permit area.
 - The analysis focuses on the proportion of land within ODF ownership that would exhibit clearcut conditions; however, the analysis is also expanded to the larger HUC 10 for context.
 - If an average of 20% of timber in the permit area of the HUC would be <10 years old over the course of the permit term, effects on fish could occur.
- A comparison of HCP and EIS Alternative 3 harvest model results for forest age 0-10 years indicate nominal changes in the overall distribution of clear-cut conditions throughout the HUC 10 watersheds.
- In general, if the HCP harvest model projects clear cut conditions will exceed 20% in a watershed (within the permit area) this exceedance is also projected to occur by the Alternative 3 model. However, under Alternative 3 the percentage by which this threshold is exceeded is generally reduced by a few percent.
 - It should be noted that for many of the HUCs that exceed 20% at some point during the threshold the permit area is a small portion of the overall HUC.
- The largest percentage of the permit area within the OR Coast Coho ESU occur in the following HUCs: Kilchis River (82%), Wilson River (79%), Lower Nehalem River (79%)
 - None of these HUCs approach or exceed the 20% threshold using the buffers in the HCP, Alternative 5 (same as HCP), or Alternative 3 scenarios.
 - There are a few time periods where the 20% threshold is exceeded in the Permit Area, but none of these translate to exceedances at the HUC-10 watershed level.
 - These occur where ODF has minimal ownership (i.e., approximately 1%) of the total area of the HUC-10. For example:
 - Mill Creek HUC total: 55,654 acres
 - Mill Creek HUC within the permit area: 412 acres (<1%)

What are the changes to habitat quantity and quality that are expected in the RCAs as a result of changed circumstances and how does that differ among alternatives (fire, disease, etc.)? Recognizing that the RCA protections do not change, are those protections expected to be durable over time and would the durability differ among alternatives.

- No significant difference among Alternatives.
- RCAs are designed to be resilient and provide durable protection to covered aquatic species through the permit term.
- The changed and unforeseen circumstances detailed in the HCP outlines potential disturbance events across the permit area, recognizing that the timing, location, extent, and severity of the disturbance can't be known *ex ante*.

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- Adaptive Management Plan allows us to be responsive to disturbance events as they occur.
- Resource impacts will depend on the nature of the disturbance, including location, extent, and severity.
- Thermal sensitivity modeling was done to ensure all streams with potential for thermal loading are protected by RCAs.

Risk and Process

Differences in estimated need for additional analyses if an alternative other than the preferred alternative is chosen, and time associated with any additional analyses.

Attachment 2 contains the response from Joe Zisa, Senior Fish and Wildlife Biologist with the U.S. Fish and Wildlife Service on modifying a proposed HCP.

Generally, the economic analysis associated with the ecosystem services and the non-harvest related forest dependent economy (recreation/special forest products/commercial fishing/carbon) seems significantly less developed than the analysis associated with the harvest economy. Recognizing that this is inevitable to some degree, are there data and methodologies available that may allow a more robust analysis?

A more robust socio-economic analysis will be included with the FMP modeled outcomes.

How risk to species would change or how assurance of achieving conservation outcomes would change if a longer historic period of record was utilized for determining large fire risk (to encompass Tillamook/Labor Day Fires) and/or if we assumed a greater future risk than the historic record (for purposes of changed circumstances).

- Based on historic events, disturbance is expected, and the response is detailed in unforeseen circumstances in the HCP.
- A threshold of 5,000 acres of HCAs or 50% of any given HCA was established for unforeseen disturbance events. Below this threshold, the HCP requires harvest spatial and temporal adjustments to harvest (i.e., harvests are shifted to account for the disturbance).
 - If an event were to exceed the threshold, it would become “unforeseen”, and the Division would not be responsible for creating conservation to offset it.
- Disturbance is exogenous and the differences among alternatives are not substantial enough to result in significant disturbance-based differences in risk to species.
- The Services chose not to model stochastic events (environmental or economic).
- From 1960–2020 there were 1,214 fires that burned 27,844 acres of ODF managed land in the permit area (Table 5). Fires were generally infrequent and small.
- In September 2020, a series of wildfires known as the Labor Day Fires event burned over 25,000 acres of ODF management lands, primarily the Beachie Creek fire in the Santiam State Forest. Similar to the Tillamook Burn, this was a rare, wind-driven event that left a mosaic of burn severity on the landscape.

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- In total, the Labor Day Fires burned approximately 25,069 acres across several ODF districts.
- The unforeseen circumstances table was updated to include the Labor Day fires and did not exceed the 5,000-acre threshold.

Table 5. Fire history on ODF managed lands by District (1960-2020). This date range is selected to be representative of modern fire suppression methods.

District	# of Fires	Acres Burned	Average Acres Burned per Fire
Northwest Oregon	628	1,176	2
West Oregon & North Cascades	127	24,776	195
Western Lane & Southwest	458	1,845	4
Tillamook	1	47	47
Total	1,214	27,844	23

Provide the rationale for HCA design and development.

Habitat Conservation Areas were designed with an iterative review process involving multiple data sources and layers of review.

1) Species occurrence:

- a) Current occupied sites for northern spotted owls and marbled murrelets
- b) Known occurrences for all covered species
 - i) Historic owl sites and observations
 - (1) Identifies areas of known owl use
 - (2) Areas with long history of occupancy or productivity
 - ii) Marbled murrelet observations
 - (1) Included 90% (1,227) of all observations
 - (2) Included 99% (349) of observations indicative of occupancy
 - (3) Included 87% (868) of presence observations
 - iii) Red Tree Vole occurrences
 - (1) Limited surveys on ODF-managed lands
 - (2) More on federal lands due to survey and manage requirements
 - (3) Subpopulations on ODF identified in USFWS Species Status Assessment, and identified as high risk of extirpation
 - iv) Oregon Slender Salamander occurrences
 - (1) Found in many places across the Santiam State Forest
 - (2) Locally abundant but endemic and limited range
 - (3) Assumed HCAs for owls and leave strategies outside HCAs adequate
 - v) Coastal Marten occurrences
 - (1) Very limited survey data
 - (2) Assumed HCAs for owls and leave strategies outside HCAs support marten habitat

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- (3) Conservation Action 8 and 10 have species-specific actions.
- 2) Habitat:
 - a) Habitat models – current and projected through permit term
 - b) LiDAR canopy height and hillshade layers - identify vegetation characteristics and topography.
 - c) Age class structure - identify old stands
 - d) Existing complex structure (Layered and Old Forest Condition) - identify stands with complex structure
 - e) Desired Future Condition Complex - identify stands in the existing landscape design or previously managed for structure.
 - 3) Landscape function design considerations
 - a) Minimize edge
 - b) Maximize interior habitat area
 - c) Enhance connectivity
 - d) Well-distributed across districts and elevations
 - e) Robust enough to be resistant and resilient to disturbance
 - 4) Operability:
 - a) Field-led effort to characterize harvest potential of individual stands
 - b) Assumed no fish and wildlife constraints
 - c) Assumed a 30-year-old stand
 - d) Stands were grouped into 4 categories (Good, average, marginal, low) based on the following considerations:
 - i) Site class/production capability
 - ii) Operational considerations
 - iii) Access
 - iv) Proximity to mainline, paved roads, mills
 - v) Neighbors
 - vi) Local issues
 - vii) Scenic considerations
 - viii) Domestic watersheds
 - ix) Recreation
 - x) Landslides and public safety
 - xi) Forest health
 - xii) Reforestation/spraying
 - 5) Development and Review Process (2020 – 2021)
 - a) ODF biologist-led first draft
 - i) Used above criteria
 - ii) Scoping team review
 - b) Field review
 - i) Suggestions for additions and removals based on operability
 - ii) Area biologists further prioritized each field suggestion based on biological considerations
 - c) Division Leadership review
 - i) Several full days of adjustments reviewing field input
 - ii) Post-hoc refinements to remove some harvestable areas and include additional operationally limited areas
 - d) Scoping Team review – subsequent minor adjustments made to incorporate some additional older stands or known occupied areas
 - e) Operational boundary adjustments
 - i) Refinements to improve operational efficiencies on both side of the HCA boundaries

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- ii) Snapped to roads, ridges, and streams
- iii) No net loss of habitat
- iv) Scoping Team review
- f) Used in modeling for Comparative Analysis

Context for Maps

Maps depicting HCAs and Riparian Conservation Areas (RCAs) overlaid on County, non-operable, alder and Swiss needle cast (SNC) restoration areas, current take avoidance acres (murrelet, Northern Spotted owl), and locations of old growth forests were requested. Context or background information for these maps is included below. The pdf format maps are designed so that the features depicted can be hidden or displayed. This can be done by clicking layers on the left menu bar (icon appears as 3 stacked squares in Figure 8) in Adobe Acrobat, then clicking the box for any individual layer to show or hide that layer.

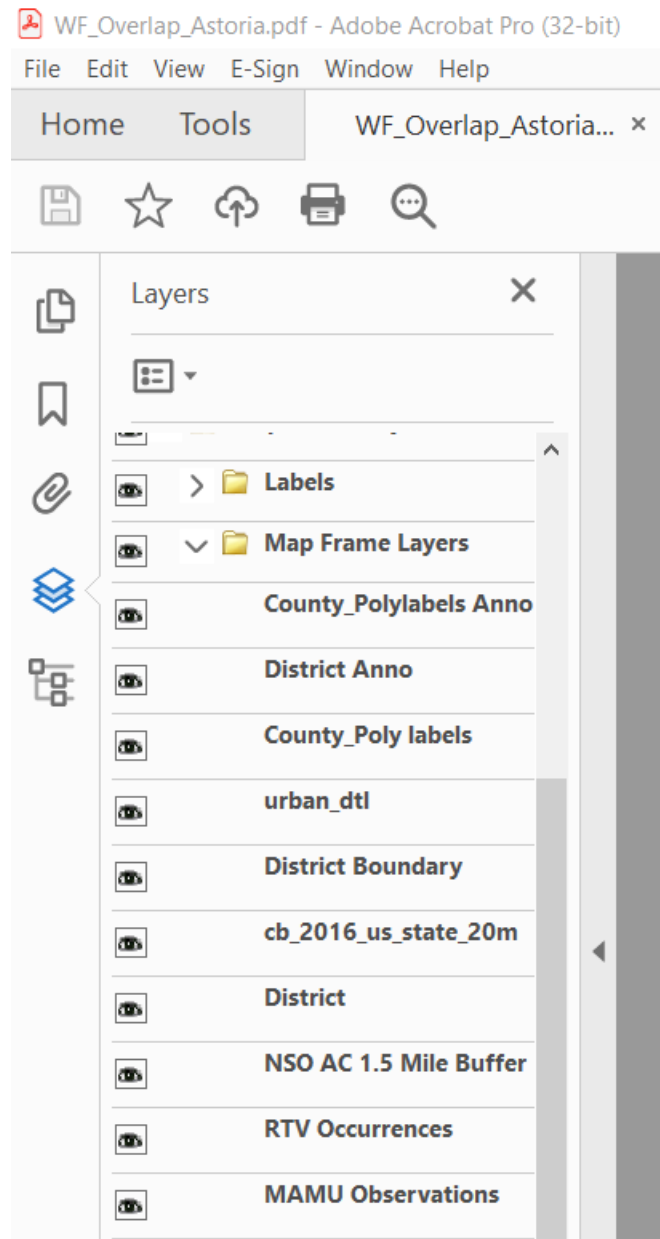


Figure 8. Accessing the clickable layers for the overlap maps in Adobe Acrobat.

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Species overlap

- 1) Northern spotted owl and marbled murrelets
 - a) Current occupied sites
 - b) Known historic occurrence (as described above)
 - c) Murrelet range limited to Coast Range
- 2) Red tree vole
 - a) Distinct Population Segment is in the Coast Range north of the Siuslaw River.
 - b) Very limited surveys on ODF-managed lands
 - i) Approximately 100 stands total from two recent studies
 - ii) Documented occurrences on Tillamook, Astoria, West Oregon, and Western Lane districts.
- 3) Oregon slender salamander and marten
 - a) Oregon slender salamander habitat is limited to North Cascade district and is more expansive than northern spotted owl habitat
 - b) Marten range is currently limited to the Central and South Coasts. Overlaps with northern spotted owl habitat in those areas and is also likely more expansive given wider range of habitat types used by the species.

Overlap of modeled habitat

- 1) Owing to the largest range, northern spotted owl-exclusive suitable habitat occurred over 224,000 acres.
- 2) All 134,000 acres of marbled murrelet habitat and 122,000 acres of red tree vole suitable habitat are shared with one or both other species.
- 3) Over 80% percent of the marbled murrelets and red tree vole habitats are nested within northern spotted owl habitats.
- 4) Driving premise of HCAs is covering for northern spotted owl mostly covers for the other covered species
- 5) Figure 9 provides a visual depiction of the overlap described above. Overlap of habitats inside and outside HCAs, along with habitat totals are shown in Table 6.

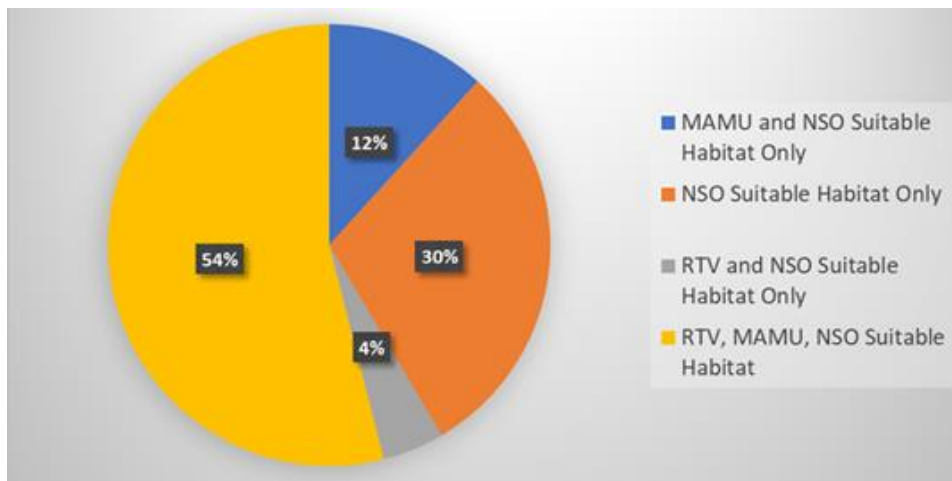


Figure 9. Overlap of northern spotted owl (NSO) habitat in the permit area with marbled murrelet (MAMU) and red tree vole (RTV) habitats.

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Table 6. Overlap of marbled murrelet (MAMU), northern spotted owl (NSO) and red tree vole (RTV) habitat inside and outside of HCAs.

	Inside HCA	Outside HCA	Grand Total
MAMU and NSO Suitable Habitat Only	14,644	7,614	22,258
NSO Suitable Habitat Only	37,183	42,882	80,065
RTV and NSO Suitable Habitat Only	5,638	4,182	9,821
RTV, MAMU, NSO Suitable Habitat	67,380	44,962	112,343
Grand Total	124,845	99,641	224,486

Other Considerations

- 1) Operationally limited acres were included where there was biological rationale (occurrence, habitat, landscape function)
- 2) SNC and hardwood-dominated stands were included where there was biological rationale (occurrence, habitat, landscape function)
 - a) Untreated acres inside HCAs offer baseline comparisons for adaptive management and may be managed farther out in the permit term in consultation with USFWS.
 - b) No wildlife-related constraints outside of HCAs allows for more efficient treatment of SNC and hardwood-dominated stands.

Old Growth Forests

- We use the Forest Ecosystem Management Assessment Team (FEMAT 1993) definition of old growth (i.e., ≥175 years old) in the 2010 FMP and HCP Conservation Action 8 (conservation actions outside of HCAs and RCAs).
- Most of the old growth stands and patches are too small and scattered to display well on district-scale maps.
- There are 76 acres of old growth outside of HCAs (3% of total).
 - 5 patches (3 – 43 acres)
 - Protected under current FMP and HCP Conservation Action 8 (Actions outside HCAs)
- There are 2,823 acres of old growth inside HCAs (97% of total).
- There are an additional 172 acres 150 – 174 years old outside of HCAs (4% of total).
 - Isolated, small, no occurrence, HCAs nearby, scattered remnants
 - Some with other constraints – scenic, high use, almost old growth (17 acres), operationally limited (23 acres)
- There are 4,061 acres 150 - 174 years old inside HCAs (96% of total).
- These data are based on the 2020 Stand Level Inventory update.
- Projected age class distributions over the permit term are shown in Figure 10 for the Proposed Action (Alternative 2), Figure 11 for Alternative 3, and Figure 12 for Alternative 5.

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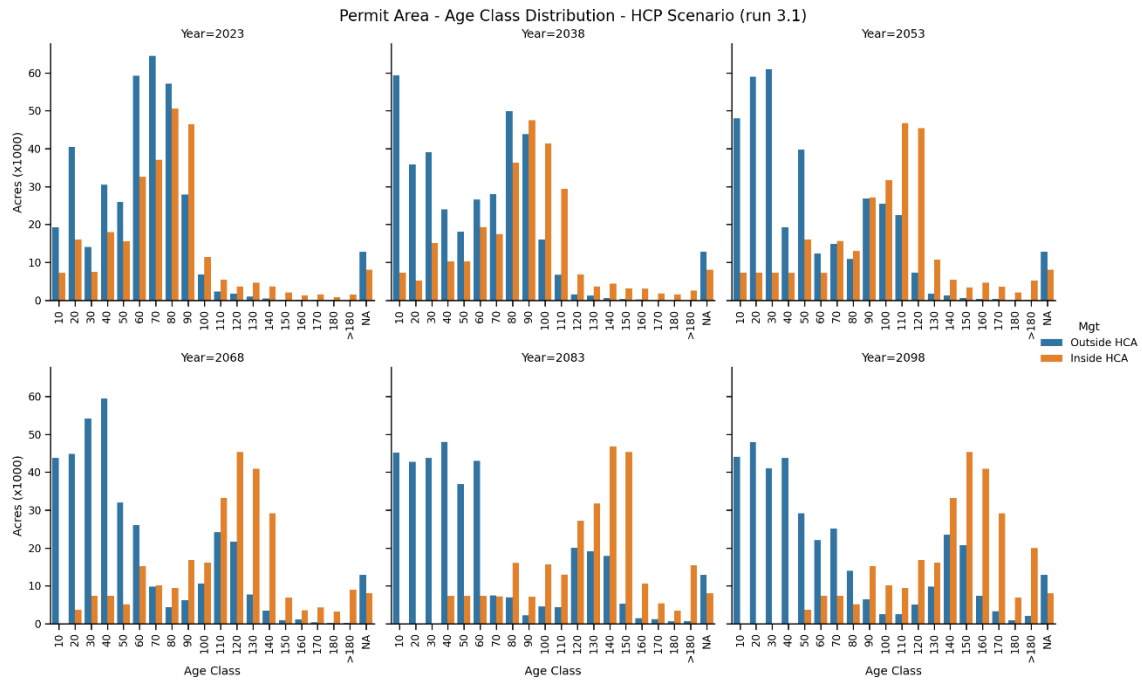


Figure 10. Age class distribution inside and outside HCAs from 2023 to 2098 for the Proposed Action (Alternative 2).

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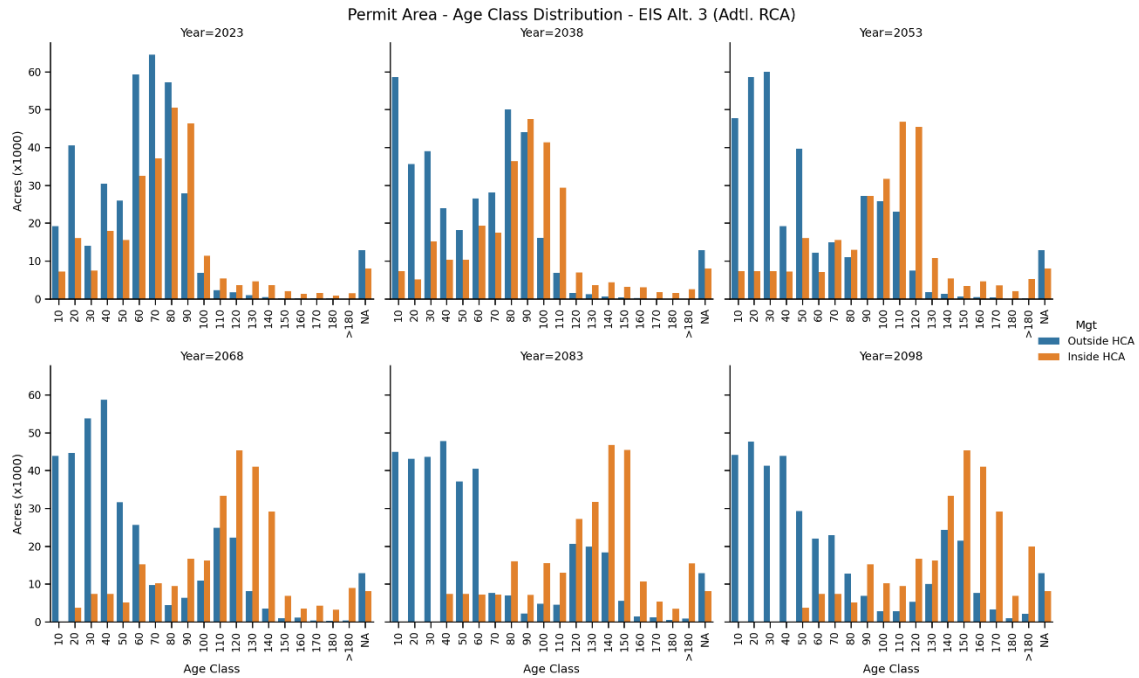


Figure 11. Age class distribution inside and outside HCAs from 2023 to 2098 for Alternative 3.

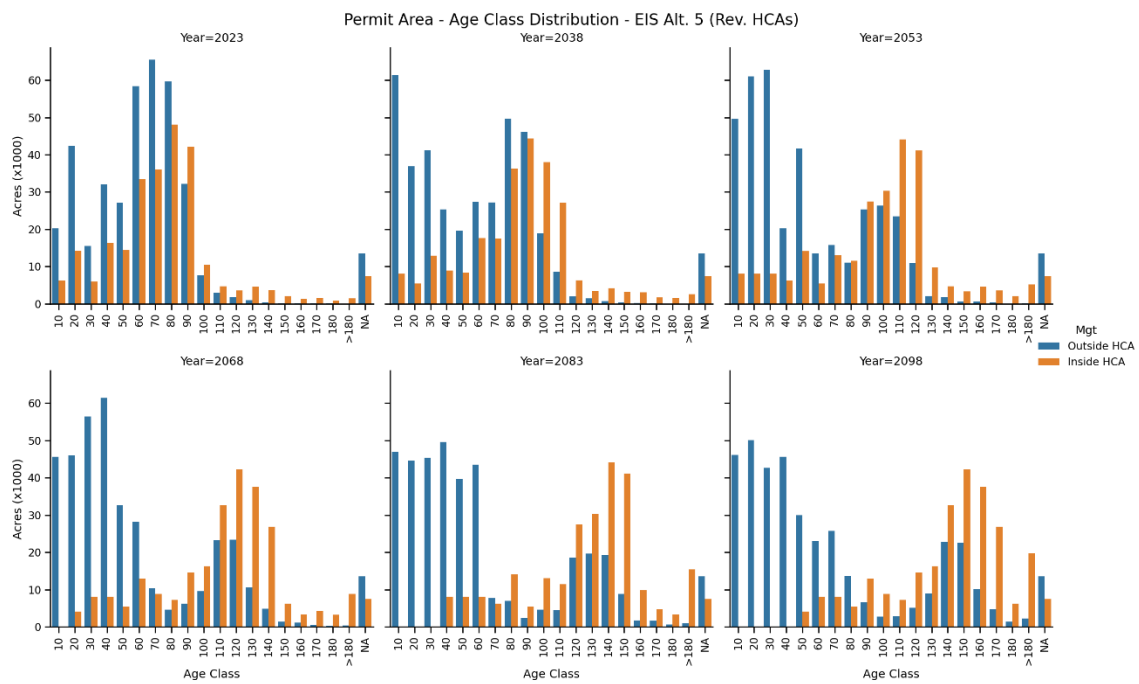


Figure 12. Age class distribution inside and outside HCAs from 2023 to 2098 for Alternative 5.

Generally, modifying a proposed HCP (at a point in the process similar to that for the WOSF HCP) to reflect a different alternative, even an alternative included in an EIS, is likely to delay and extend the Fish and Wildlife Service's process—especially the ESA (section 7 consultation/BiOp and section 10 Findings) part of the process. Additional/new work, analyses, data, and dialogue is likely to be required to determine adequacy with respect to ESA. Several factors drive this sort of outcome, including:

- Typically only the identified preferred/proposed alternative is formally evaluated against ESA section 10 issuance criteria. For instance, a finding of “no jeopardy” is one of the issuance criteria, but FWS doesn't conduct consultation (the only way to formally assess jeopardy) on every NEPA alternative. Instead, by necessity, we use collective professional judgments to identify (and exclude from further consideration) those alternatives that are reasonably likely to NOT meet issuance criteria (jeopardy or any others). The alternatives that do end up in an EIS, therefore, are generally ones we A) could not determine (up-front) would fail to meet issuance criteria, or B) think could meet issuance criteria, rather than ones we've actually determined do meet issuance criteria. That's an important distinction, and means we're often moving forward with some degree of uncertainty about whether any particular alternative in a NEPA document would actually pass muster upon comprehensive scrutiny under ESA.
- The analyses undertaken for NEPA are not the same analyses used to make the ESA section 7 and section 10 determinations. Sure, there's some overlap and applicability; we try to shape the NEPA analyses to be as informative as possible re: ESA. But additional work is always required to complete our BiOps and Findings.
- While NEPA and ESA analyses are separate and different, there's some “co-dependency” between them, especially in the later stages after public comment on the DEIS as we focus our efforts on a preferred or proposed alternative. For instance, completed BiOps inform RODs and RODs could also change proposed actions, which might necessitate additional or new ESA consultations, BiOps, and Findings. It's very hard to predict what will be unleashed by any tweak to the products of either process. Obviously, more substantial tweaks create more likelihood of substantial ramifications.
- Seemingly “simple” changes to proposed alternatives often have very complicated and impactful implications for the adequacy of the alternative and/or the adequacy of prior analyses of the alternative. HCP components don't influence adequacy or operate in isolation; the importance of any single component depends on its interaction with other components, and modifying a single component could affect the importance/value of many other components. As an example, in landscape management (e.g. forestry) HCPs, increasing/decreasing conservation areas results in net effects not only by altering how much benefit is derived from those areas, but also by altering the amount, frequency, and intensity of adverse impacts that will occur outside of those areas. So the true measure of a change to any part of an HCP proposal isn't always reflected in the “face value” of that change, and even if the overall HCP remains adequate following a change, new data and analyses could be needed to make that determination.

In a nutshell, much of the work to determine whether an alternative is adequate for issuance of an ITP entails work and analyses beyond those done for NEPA, and is done on a single alternative—typically the preferred or proposed alternative. Usually, before this rigorous assessment is formally triggered, the ITP applicant and the Service have engaged in extensive informal consultation (discussion, negotiation, data

collection and evaluation, etc.) that refines the applicant's proposal in the direction of higher likelihood of meeting ESA issuance criteria.

With respect to the WOSF HCP, FWS has been engaged with ODF for about two years in the type of informal consultations (and now beginning the more formal stages) mentioned above, focused on the current HCP proposal. We arrived at this focus from: A) direction emerged from ODF and Steering/Scoping Committees, B) public input processes, and C) Service staff perspectives about likelihood of adequacy. Obviously, I can't predict exactly where this would lead the ongoing WOSF HCP process following a modified proposed action. That would be contingent on the specific nature and magnitude of the modifications. But in my individual judgment, I think a different HCP alternative, even one considered in the DEIS, represents a meaningful risk of triggering the challenges I've described, above, including the need for new/extended Informal and Formal consultation and Findings processes by FWS, and for information and analyses beyond those in the DEIS or pending FEIS. Those challenges aren't necessarily insurmountable. Over the long-term, we'd sort things out and make an issuance determination one way or another.

