

Appendix B. Methods used for estimation of vegetation conditions across a range of management scenarios to support application of the Interagency Deer Habitat Suitability Model.

To estimate the changes in vegetation in the study area due to 6 different possible timber harvest management decisions, we used the following assumptions to construct GIS-based maps of vegetation change at 10-year intervals (i.e., in 2015, 2025, 2035, and 204). These vegetation changes were subsequently used to calculate changes in deer carrying capacity. For each vegetation scenario, we discuss assumptions by land designation such as likely amount of harvest of different forest classes, and include the Mental Health Land Trust Exchange Proposal (MHLT), the Sealaska Land Entitlement Finalization, Tongass National Forest lands, State of Alaska Forest lands, and Other ANCSA Corporation lands.

1) No future harvest

This potential vegetation future assumes no further harvest of timber in the Prince of Wales study area after 2014, including no harvest of lands that are part of Mental Health Land Trust Exchange Proposal, the Sealaska Land Entitlement Finalization, Tongass National Forest lands, State of Alaska Forest lands, and Other ANCSA Corporation lands.

2) Transition to young growth

This potential vegetation future is based on the transition from harvest of old-growth to young-growth forest, as planned by the U.S. Forest Service, and includes some harvest of old growth to supply the timber industry over a 10-15 year period while more young-growth grows to harvestable age.

Tongass National Forest

- The land base excludes roadless areas according to 2001 Roadless Rule, and is located entirely within the 2008 Tongass Land Management Plan (USFS 2008) Phase 1 Suitable Land Base.
- Assumes the Big Thorne Timber Sale proceeds, and provides an estimated 149 million board feet (mmbf) of old-growth (OG) timber.
- The location and schedule of additional OG and young-growth (YG) projects are those currently described in the 5-year schedule of activities. These include small OG sales as part of Kosciusko Island Stewardship (12 mmbf YG, 1 mmbf OG) in 2015; Naukati-Staney-Sea Otter Sound (10 mmbf YG, 10 mmbf OG) in 2017; Polk Inlet/12-Mile Stewardship (20 mmbf YG, 10 mmbf OG) in 2018, Neck Lake/Alder Creek (13 mmbf OG) in 2019, and Polk/12-Mile Stewardship II (5 mmbf YG, 5 mmbf OG) in 2018.
- Specific locations of YG units to be logged in 2nd-rotation, even-aged harvest during this period were provided by USFS, and total approximately 40,000 acres.
- For OG harvest, the specific locations of timber stands to be logged were identified by first limiting the query to the specific watersheds (Value Comparison Units) listed in the USFS Activities Schedule. This land base contains more than enough timber to

meet this level of demand. A sub-set of timber lands most likely to be logged was identified using a timber Resource Selection Function (RSF) developed by Albert and Scheon (2013) based on stand characteristics disproportionately selected for logging during 1954 – 2004. We refer to these stands as ‘preferentially selected’ timber lands, as distinct from the more general classification of ‘suitable’ used in the TLMP. We adjusted the resource selection index to meet the required volume estimates of each sale, equivalent to $RSF > 0.5$ and yielding an estimated 1,195 acres of OG harvest and a total of approximately 40.5 mmbf of sawlog + utility (S + U) volume.

Mental Health Land Trust Exchange Proposal

- Assumes that the MHLT exchange is not approved.

Sealaska Land Entitlement Finalization

- Includes lands transferred to Sealaska under the Land Entitlement Finalization Act of 2014.
- These lands contain approximately 33,228 acres of productive OG forest, with approximately 25,422 acres of preferentially selected ($RSF > 0.18$) OG timber lands containing approximately 842 mmbf of OG timber (S+U).
- Assumes that preferentially selected OG timber within these lands would be logged at an even rate over 30 years for an average rate of approximately 850 acres or 28 mmbf/year.

State of Alaska forest lands

- Includes logging expected to continue on State Forest Lands.
- The State of Alaska State Forest manages approximately 48,472 acres in the Southeast Alaska State Forest, with approximately 28,500 acres of these in the Prince of Wales study area. These lands contain an estimated 10,954 acres of preferentially selected ($RSF > 0.18$) OG timber lands and 333.3 mmbf of timber.
- Assumes that preferentially selected OG timber lands managed by the State of Alaska will be logged at an even pace over the 30 year period (2015 – 2045) of 365 acres or 11 mmbf /year.

Other ANCSA Corporation lands

- Accounts for logging expected to continue on lands currently owned by ANCSA village and regional corporations. Not including the Sealaska Land Finalization Act, ANCSA corporations own approximately 326,683 acres within the Prince of Wales study area. These lands currently contain approximately 161,000 acres of previously logged forest lands and an estimated 97,600 acres remaining in OG condition.
- Because of this relatively high level of previous harvest, and under the assumption that most of the originally economic timber lands have already been harvested, we applied a more conservative estimate of potential future logging on ANCSA corporation lands using a selectivity index of $RSF > 40$ to estimate OG timber remaining that will potentially be logged in the future. Using this assumption, we estimate approximately 13,000 acres of productive OG timber available for future harvest on ANCSA corporation lands.

- Assumes these preferentially selected timber lands will be logged at an even pace over the 30 year period, with approximately 434 acres or 14 mmbf logged per year (Table A1).

3) Continued harvest of old-growth forest

This potential vegetation future is the result of the continued harvest of old-growth forest at observed recent levels (2008-2014).

Tongass National Forest

- The land base excludes roadless areas according to 2001 Roadless Rule, and is located entirely within the TLMP 2008 Phase 1 Suitable Land Base.
- Assumes approximately 34 mmbf per year of timber (S + U) from the Tongass National Forest. The proportion of supply from POW is assumed to be 37% of total Tongass supply, or 12.6 mmbf/year, 126 mmbf/decade or 377 mmbf during 2015 – 2045 (Table A1). This is based on proportional representation of all Tongass timber that occurs within Prince of Wales suitable, roaded and Phase 1 land base.
- Assume Big Thorne Timber Sale proceeds, and accounts for a proportion of the demand described above. The estimated 149 mmbf from Big Thorne would reduce the remaining demand for OG supply from POW to a total of 228 mmbf during the period 2015-2045.
- Uses an RSF > 0.67 provided approximately the correct number of acres to meet this scenarios assumption.

Mental Health Land Trust Exchange Proposal

- Assumes that the MHLT exchange is approved.
- Preferentially selected (RSF > 0.18) OG forest lands within the MHLT exchange parcels include 13,952 acres and approximately 488.7 million board-feet of timber (S + U).
- Assumes that preferentially selected OG timber within these lands would be logged at an even rate over 30 years for an average rate of 462 acres or 15 mmbf/year (Table A1).

Sealaska Land Entitlement Finalization

- Accounts for lands transferred to Sealaska under the Land Entitlement Finalization Act of 2014.
- These lands contain approximately 33,228 acres of productive OG forest, with approximately 25,422 acres of preferentially selected (RSF > 0.18) OG timber lands containing approximately 842 mmbf of OG timber (S + U).
- Assumes that preferentially selected OG timber within these lands would be logged at an even rate over 30 years for an average rate of approximately 850 acres or 28 mmbf/year.

State of Alaska Forest Lands

- Accounts for logging expected to continue on State Forest Lands.
- The State of Alaska State Forest manages approximately 48,472 acres in the Southeast Alaska State Forest, with approximately 28,500 acres of these in the Prince

of Wales study area. These lands contain an estimated 10,954 acres of preferentially selected ($RSF > 0.18$) OG timber land and 333.3 mmbf of timber (SL + U).

- Assumes that preferentially selected OG timber lands managed by the State of Alaska will be logged at an even pace over the 30 year period (2015 – 2045) of 365 acres or 11 mmbf/year.

Other ANCSA Corporation Lands

- Accounts for logging expected to continue on lands currently owned by ANCSA village and regional corporations, including approximately 326,683 acres within the Prince of Wales study area. These lands currently contain approximately 161,000 acres of previously logged forest lands and an estimated 97,600 acres remaining in OG condition.
- Because of this relatively high level of previous harvest, and under the assumption that most of the originally economic timber lands have already been harvested, we applied a more conservative estimate of potential future logging on ANCSA corporation lands using a selectivity index of $RSF > 40$ to estimate OG timber remaining that will potentially be logged in the future. Using this assumption, we estimate approximately 13,000 acres of productive OG timber available for future harvest on ANCSA corporation lands.
- Assumes these preferentially selected timber lands will be logged at an even pace over the 30 year period, with approximately 434 acres or 14 mmbf logged per year (Table A1).

4) Increased harvest of old-growth forest

This potential vegetation future is the result of increased harvest of old-growth forest at observed former levels (1995-2000).

Tongass National Forest

- The land base excludes roadless areas according to 2001 Roadless Rule, and is located entirely within the TLMP 2008 Suitable Land Base of all phases (1, 2 & 3) of the TLMP Adaptive Management Strategy.
- Assumed Supply from POW is 35.5% of total Tongass supply, or 47.6 mmbf/year, 476 mmbf/decade or 1,427 mmbf during 2015 – 2045. This is based on proportional representation of all Tongass timber that occurs within the Prince of Wales suitable, roaded and Phase 1,2 & 3 land base.
- Assume Big Thorne Timber Sale proceeds, and accounts for a proportion of the supply demand described above. In this case, the estimated 149 mmbf from Big Thorne would reduce the remaining demand for OG supply from POW to a total of 1,278 mmbf during the period 2015 – 2045.

Mental Health Land Trust Exchange Proposal

- Assumes that the MHLT exchange is approved.
- Assumes that preferentially selected OG timber within these lands would be logged at an even rate over 15 years for an average rate of 923 acres or 30 mmbf/year (Table A1).

Sealaska Land Entitlement Finalization

- Accounts for lands transferred to Sealaska under the Land Entitlement Finalization Act of 2014.
- Assumes that preferentially selected OG timber within these lands would be logged at an even rate over 15 years for an average rate of approximately 1,700 acres or 56 mmbf/year (Table A1).

State of Alaska Forest Lands

- Accounts for logging expected to continue on State Forest Lands.
- Assumes that preferentially selected OG timber lands managed by the State of Alaska will be logged at an even pace over the 15 year period (2015-2030) of 730 acres or 22 mmbf/year.

Other ANCSA Corporation Lands

- This scenario assumes preferentially selected timber lands ($RSF > 0.4$) currently owned by ANCSA corporations (not including Sealaska Land Finalization) will be logged at an even pace over the 15 year period of 2015-2030, with approximately 868 acres or 28 mmbf logged per year (Table A1).

5) Maximum harvest of old-growth forest

This potential vegetation future is the result of the maximum harvest of old-growth forest at highest levels described in the TLMP (all lands/Phase 1-3/intensive).

Tongass National Forest

- Assumes maximum harvest allowable under the 2008 TLMP, or approximately 267 mmbf/year from the entire Tongass National Forest.
- Assumes that administrative protections applied under the Roadless Rule is repealed for the Tongass National Forest. The land base for this scenario includes roaded and roadless areas within the TLMP 2008 Suitable Land Base of all phases (1, 2 & 3) of the TLMP Adaptive Management Strategy.
- Assumed Supply from POW is 25.5% of total Tongass supply, or 69.2 mmbf/year, 692 mmbf/decade or 2,074 mmbf during 2015-2045. This is based on proportional representation of all Tongass timber that occurs within the Prince of Wales suitable and available land base under the 2008 TLMP.
- Assumes Big Thorne Timber Sale proceeds, and accounts for a proportion of the supply demand described above. The estimated 149 mmbf from Big Thorne would reduce the remaining demand for OG supply from POW to a total of 1,925 mmbf during the period 2015-2045.

Mental Health Land Trust Exchange Proposal

- Assumes that the MHLT exchange is approved.
- Assumes that preferentially selected OG timber within these lands would be logged at an even rate over 10 years for an average rate of 1,385 acres or 45 mmbf/year (Table A1).

Sealaska Land Entitlement Finalization

- Accounts for lands transferred to Sealaska under the Land Entitlement Finalization Act of 2014.
- Assumes that preferentially selected OG timber within these lands would be logged at an even rate over 10 years for an average rate of approximately 2,500 acres or 84 mmbf/year (Table A1).

State of Alaska Forest Lands

- Accounts for logging expected to continue on State Forest Lands.
- Assumes that preferentially selected OG timber lands managed by the State of Alaska will be logged at an even pace over the 10 year period (2015-2030) of 1,100 acres or 33 mmbf/year.

Other ANCSA Corporation Lands

- Assumes preferentially selected timber lands ($RSF > 0.4$) currently owned by ANCSA corporations (not including Sealaska Land Finalization) will be logged at an even pace over the 10 year period of 2015- 2030, with approximately 1,300 acres or 42 mmbf logged per year (Table A1).

Table A1: Summary of assumptions for rate of harvest of old-growth (OG) and young-growth (YG) across categories of land ownership in the Prince of Wales study area among future vegetation changes considered. Land ownership designations include

Tongass National Forest lands (TNF), the Sealaska Land Entitlement Finalization (SL), the Metal Health Land Trust Exchange Proposal (MHLT), State of Alaska Forest lands (SAF), and Other ANCSA Corporation lands (AC).

Vegetation	TNF	SL	MHLT	SAF	AC	Total
<i>Transition to YG</i>	USFS 5-yr Schedule of Activities.	30 yrs, 28 mmbf/yr	Remains TNF	30 yrs, 11 mmbf/yr	30 yrs, 14 mmbf/yr	53 mmbf/yr + Transition Schedule
<i>Continued OG</i>	12.6 mmbf/yr	30 yrs, 28 mmbf/yr	30 yrs, 15 mmbf/yr	30 yrs, 11 mmbf/yr	30 yrs, 14 mmbf/yr	80.6 mmbf/yr
<i>Increased OG</i>	47.6 mmbf/yr	15 yrs, 56 mmbf/yr	15 yrs, 30 mmbf/yr	15 yrs, 22 mmbf/yr	15 yrs, 28 mmbf/yr	183.6 mmbf/yr
<i>Maximum OG</i>	69.2 mmbf/yr	10 yrs, 84 mmbf/yr	10 yrs, 45 mmbf/yr	10 yrs, 33 mmbf/yr	10 yrs, 42 mmbf/yr	273.2 mmbf/yr