



MMLTCS and SHC

A report to the Board of Natural Resources

presented by

Angus Brodie and Andy Hayes

July 5, 2017

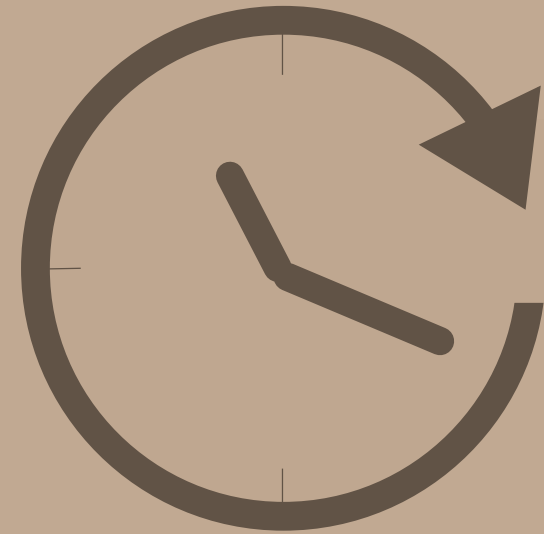


Today's Outline

- Timeline
- Response to last month's questions
- Financial analysis
- Public comments/proposed alternatives



Timeline



Preferred alternative timeline



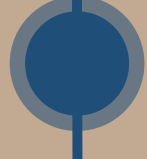
April: Summary of public comments



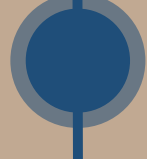
May: MM/SHC background and deferral summary



June: MMLTCS/Arrearage/Riparian and decision process



July: Financial analysis and proposed alternatives



August: 2-day BNR retreat



September: BNR selects a preferred MMLTCS alternative

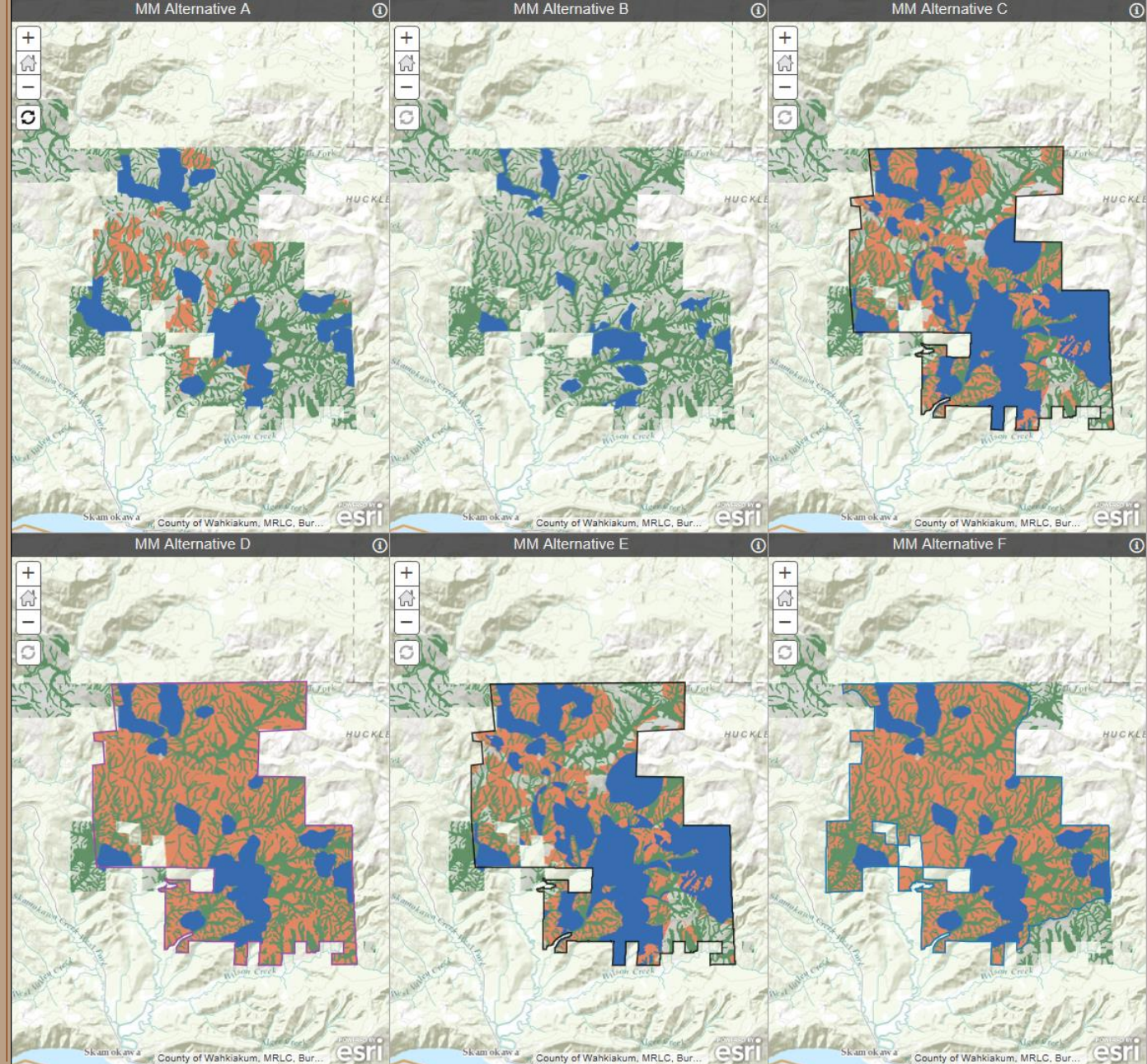


Response to last month's questions



1. Maps of MMLTCS components and alternatives

Visit the
Story map @
dnr.wa.gov/mmltcs

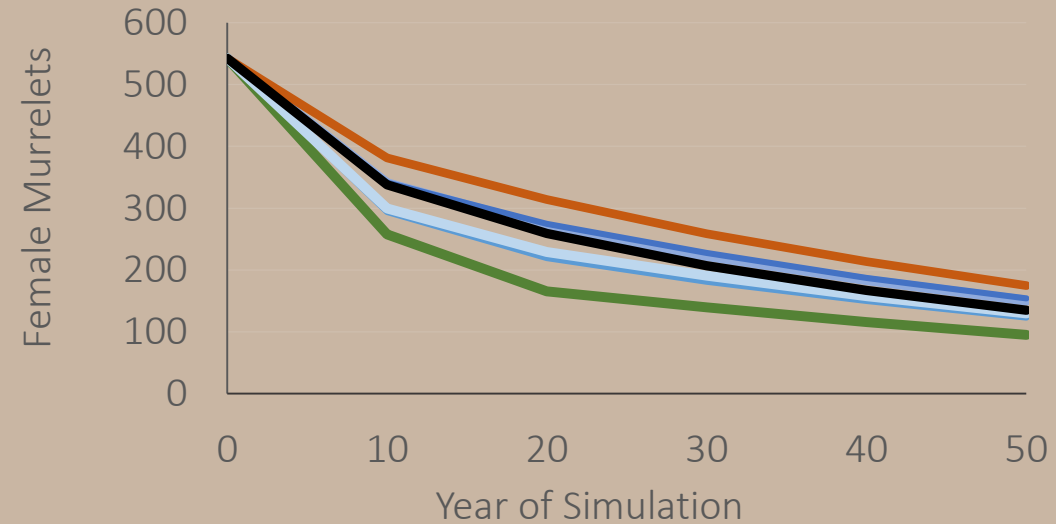


2. PVA analysis – Risk vs. Enhancement

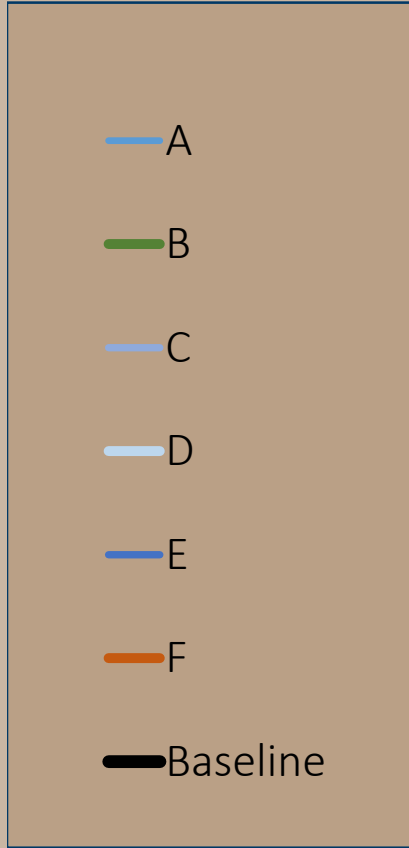
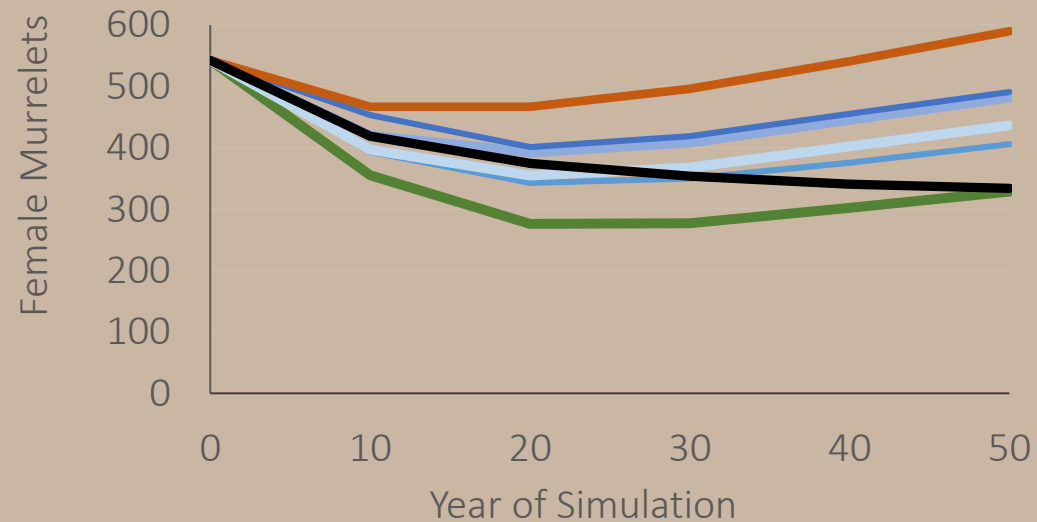
Risk runs use a 0.87 annual non-juvenile survival rate based on historical trends.

Enhancement runs use a 0.90 annual non-juvenile survival rate based on Peery's 2006 marked-recapture research in California.

DNR - Risk

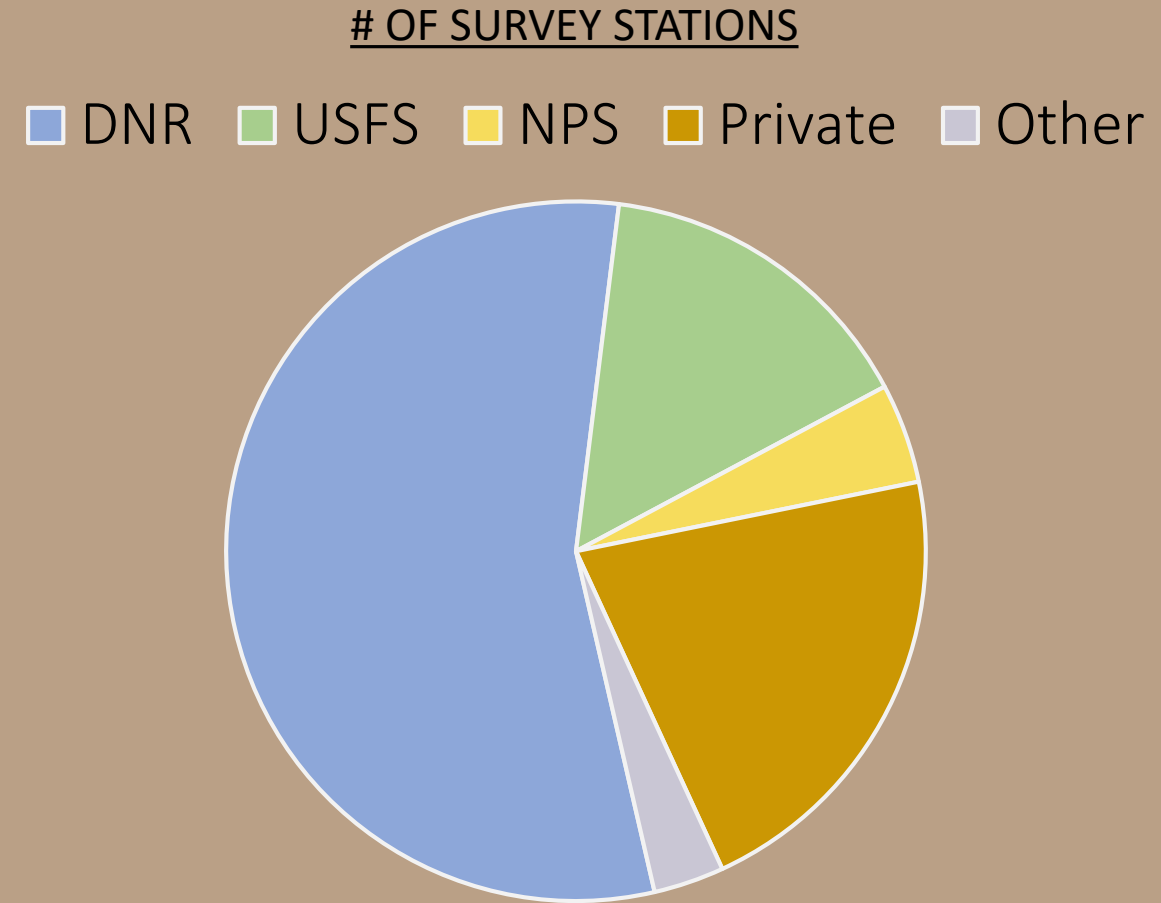


DNR - Enhancement



3. Survey effort by land ownership

Ownership	# of survey stations	# of occupied detections
DNR	10,077 (56%)	2,861 (56%)
Private Lands	3,865 (21%)	730 (14%)
US Forest Service	2,763 (15%)	840 (16%)
National Park Service	836 (5%)	596 (12%)
Other	591 (3%)	127 (2%)
TOTAL	18,132	5,154



Financial Analysis

murrelet, arrearage, riparian scenarios



Purpose

To provide financial projections to help the board understand how each scenario affects DNR's ability to meet its trust management obligations, including:

- The generation of revenue for trust beneficiaries
- Ability to generate revenue in perpetuity
- Impartiality with respect to current and future beneficiaries
- Maintaining the corpus of the trust

Decisions and Metrics

DNR has identified 48 possible combinations of the three decision options. Of these, 12 would produce identical results as others, so 36 combinations are analyzed and shown.

Options

Marbled Murrelet (6x)

Arrearage (4x)

Riparian Thinning (2x)

Metrics Analyzed

Net Present Value

Volume

Area

Management Funds

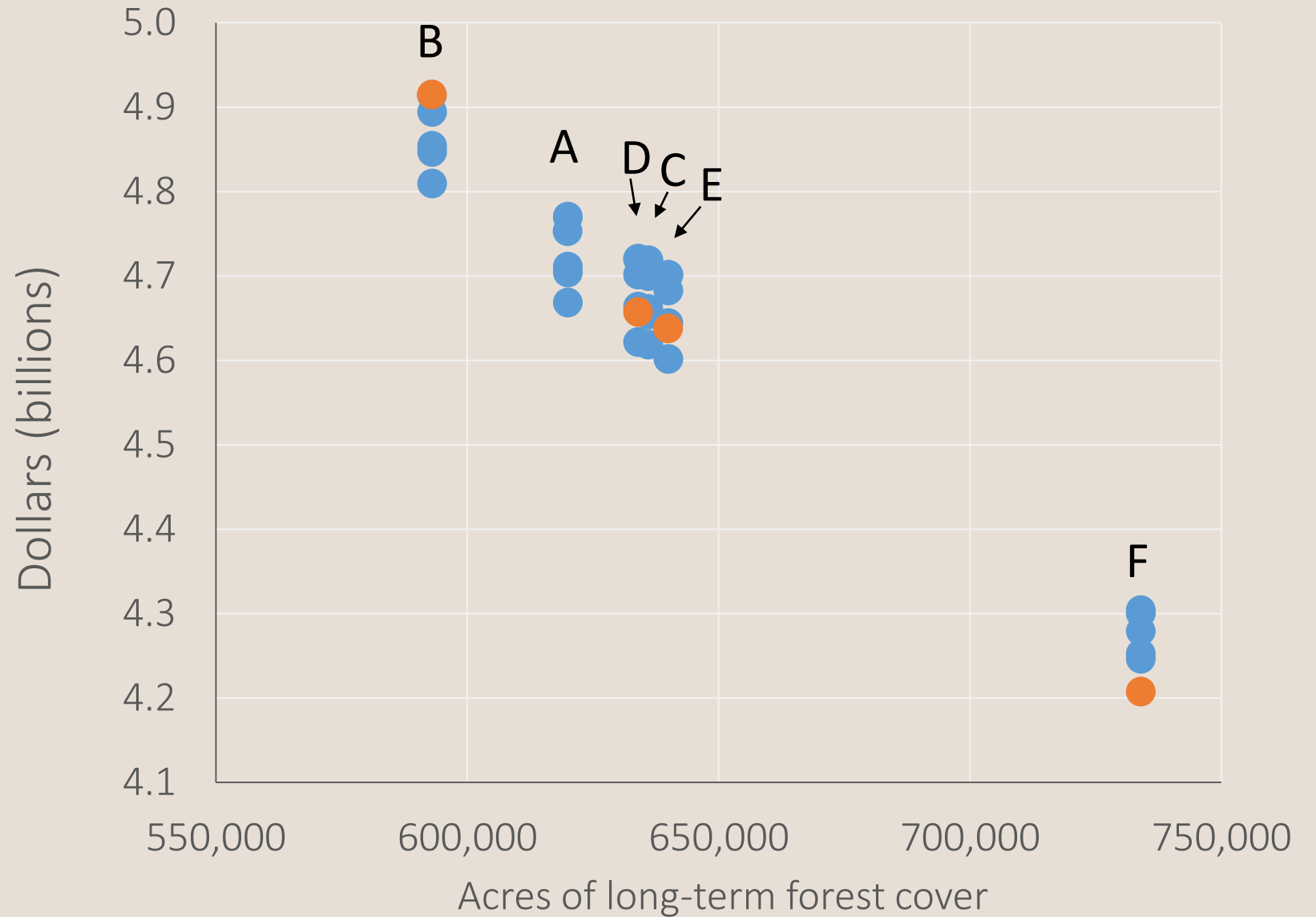
Western WA 10-Decade NPV

Each circle represents one combination of murrelet, arrearage, and riparian options.

NOTES

Letters indicate corresponding MMLTCS alternative.

Orange dots indicate SHC alternatives.



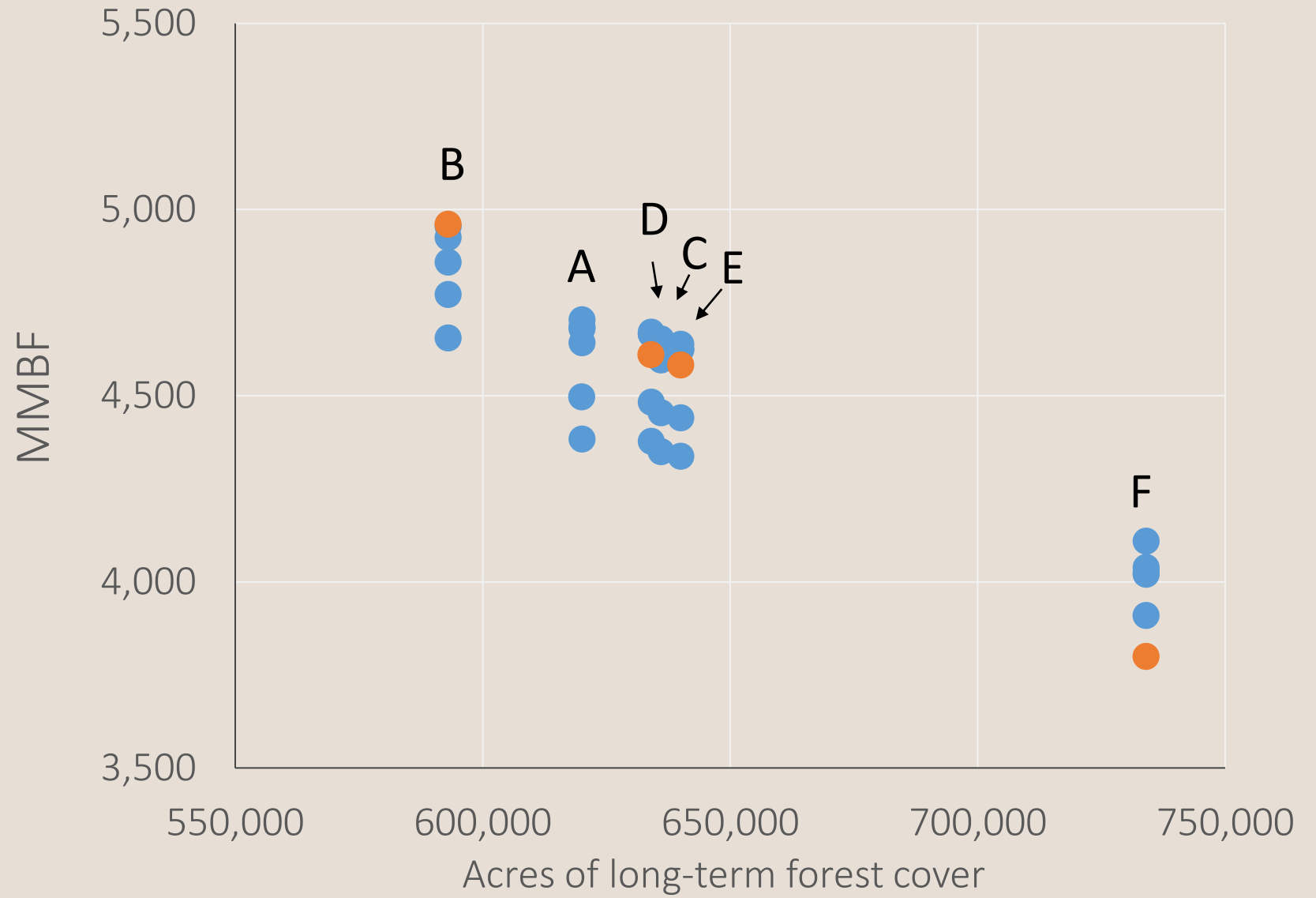
Western WA Planning Decade Volume

Each circle represents one combination of murrelet, arrearage, and riparian options.

NOTES

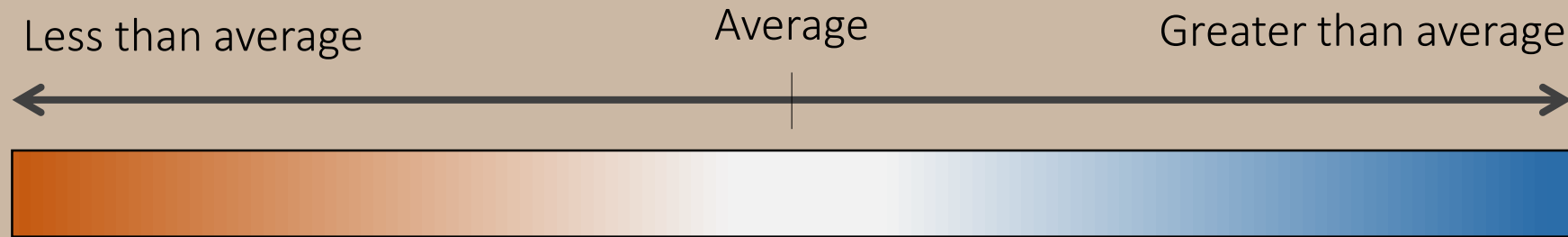
Letters indicate corresponding MMLTCS alternative.

Orange dots indicate SHC alternatives.



How data are presented:

Color gradient corresponds to relative relationship between cells.



Example:

	Factor 1	Factor 2	Factor 3
Factor A	1	5	5
Factor B	2	5	8
Factor C	9	7	3

10-decade NPV (\$ billions) Western Washington

Marbled Murrelet LTCS Alt	Arrearage harvest					
	702 MMBF		462 MMBF		No specific level	
	Riparian thinning					
	10%	1%	10%	1%	10%	1%
Alt A	4.77	4.71	4.77	4.70	4.75	4.67
Alt B	4.91	4.85	4.91	4.85	4.89	4.81
Alt C	4.72	4.66	4.72	4.65	4.70	4.62
Alt D	4.72	4.66	4.72	4.66	4.70	4.62
Alt E	4.70	4.64	4.70	4.64	4.68	4.60
Alt F	4.30	4.25	4.30	4.25	4.28	4.21



How data are presented:

Range of change in NPV as a percent of maximum NPV

The following percentages are calculated by taking the **greatest difference between the highest and lowest NPV of a given factor** (*murrelet, arrearage, or riparian*) while keeping the other two factors constant, and then **dividing by the maximum NPV** reached by any combination of choices.

How data are presented:

Range of change in NPV as a percent of maximum NPV

EXAMPLE

Common School 10-decade NPV

Marbled Murrelet LTCS Alt	Arrearage harvest					
	702 MMBF		462 MMBF		Rolled in	
	Riparian thinning					
	10%	1%	10%	1%	10%	1%
Alt A	1,679	1,654	1,679	1,652	1,674	1,638
Alt B	1,711	1,685	1,709	1,683	1,704	1,670
Alt C	1,664	1,639	1,664	1,637	1,655	1,621
Alt D	1,655	1,631	1,655	1,628	1,648	1,614
Alt E	1,659	1,636	1,659	1,633	1,651	1,617
Alt F	1,476	1,456	1,477	1,457	1,477	1,449



How data are presented:

Range of change in NPV as a percent of maximum NPV

EXAMPLE

Common School 10-decade NPV

Marbled Murrelet LTCS Alt	Arrearage harvest					
	702 MMBF		462 MMBF		Rolled in	
	Riparian thinning					
	10%	1%	10%	1%	10%	1%
Alt A	1,679	1,654	1,679	1,652	1,674	1,638
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Alt D	1,655	1,631	1,655	1,628	1,648	1,614
Alt E	1,659	1,636	1,659	1,633	1,651	1,617
Alt F	1,476	1,456	1,477	1,457	1,477	1,449
	=235	=229	=232	=226	=227	=221

1. Find differences between highest and lowest NPV for a given factor (murrelet) within the same combination of the other two factors.

How data are presented:

Range of change in NPV as a percent of maximum NPV

EXAMPLE

Common School 10-decade NPV

Marbled Murrelet LTCS Alt	Arrearage harvest					
	702 MMBF		462 MMBF		Rolled in	
	Riparian thinning					
	10%	1%	10%	1%	10%	1%
Alt A	1,679	1,654	1,679	1,652	1,674	1,638
Alt B	1,711	1,685	1,709	1,683	1,704	1,670
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Alt F	1,476	1,456	1,477	1,457	1,477	1,449
	=235	=229	=232	=226	=227	=221

1. Find differences between highest and lowest NPV for a given factor (murrelet) within the same combination of the other two factors.
2. Select largest difference.

How data are presented:

Range of change in NPV as a percent of maximum NPV

EXAMPLE

Common School 10-decade NPV

Marbled Murrelet LTCS Alt	Arrearage harvest					
	702 MMBF		462 MMBF		Rolled in	
	Riparian thinning					
	10%	1%	10%	1%	10%	1%
Alt A	1,679	1,654	1,679	1,652	1,674	1,638
Alt B	1,711	1,685	1,709	1,683	1,704	1,670
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Alt D	1,655	1,631	1,655	1,628	1,648	1,614
Alt E	1,659	1,636	1,659	1,633	1,651	1,617
Alt F	1,476	1,456	1,477	1,457	1,477	1,449
	=235	=229	=232	=226	=227	=221

1. Find differences between highest and lowest NPV for a given factor (murrelet) within the same combination of the other two factors.

2. Select largest difference.

3. Divide that number by the largest NPV on the chart, regardless of factor combination. Multiple by 100.

$$\frac{235}{1711} * 100 = 14\%$$

Effect of Murrelet on 10-decade NPV for each trust

Range of change in NPV as a percent of maximum NPV

0%

1- 10%

11+%

Community college (2%)

State Forest Purchase (3%)

Other (5%)

State Forest Transfer (11%)

Agriculture School (13%)

Common School (14%)

Normal School (15%)

Capitol Grant (16%)

Scientific School (17%)

CEPRI (22%)

University (31%)



Effect of Murrelet on 10-decade NPV for each county

Range of change in NPV as a percent of maximum NPV

0%

Clark
Cowlitz
Mason
Kitsap

1- 10%

Skamania (1%)
Grays Harbor (2%)
Thurston (2%)
Jefferson (4%)
King (10%)

11+%

Snohomish (11%)
Clallam (12%)
Skagit (17%)
Lewis (19%)
Whatcom (25%)
Pacific (27%)
Pierce (36%)
Wahkiakum (48%)



Effects of MMLTCS on individual counties

10-decade NPV (\$ millions)

State Forest Transfer Trust lands in Wahkiakum County.

Marbled Murrelet LTCS Alt	Arrearage harvest					
	702 MMBF		462 MMBF		Rolled in	
	Riparian thinning					
	10%	1%	10%	1%	10%	1%
Alt A	36	35	36	35	36	35
Alt B	48	47	48	47	48	46
Alt C	32	31	32	31	32	30
Alt D	31	30	31	30	30	29
Alt E	32	31	32	31	32	30
Alt F	25	24	25	24	25	24

10-decade NPV (\$ millions)

State Forest Transfer Trust lands in Jefferson County.

Marbled Murrelet LTCS Alt	Arrearage harvest					
	702 MMBF		462 MMBF		Rolled in	
	Riparian thinning					
	10%	1%	10%	1%	10%	1%
Alt A	55	55	55	55	55	55
Alt B	57	57	57	57	57	57
Alt C	57	57	57	57	57	57
Alt D	57	57	57	57	57	57
Alt E	57	57	57	57	57	57
Alt F	57	57	57	57	57	57

Effect of **Arrearage** on 10-decade NPV for each trust

Range of change in NPV as a percent of maximum NPV

1%

Capitol Grant
Common School
Community College
Other
State Forest Purchase
State Forest Transfer

2%

Agriculture School
CEPRI
Normal School

3+%

Scientific School (3%)
University (9%)



Effect of **Arrearage** on 10-decade NPV for each county

Range of change in NPV as a percent of maximum NPV

0%

Grays Harbor
Skagit
Snohomish
Thurston
Clark
Jefferson
King
Kitsap
Mason

1%

Clallam
Cowlitz
Lewis
Pacific
Pierce
Wahkiakum
Whatcom

2+%

Skamania (3%)



Effects of Arrearage on individual counties

10-decade NPV (\$ millions) State Forest Transfer Trust lands in Skamania County

Marbled Murrelet LTCS Alt	Arrearage harvest					
	702 MMBF		462 MMBF		Rolled in	
	Riparian thinning					
	10%	1%	10%	1%	10%	1%
Alt A	108	107	107	106	105	104
Alt B	108	107	107	106	105	104
Alt C	108	107	107	106	105	104
Alt D	108	107	107	106	105	104
Alt E	107	107	107	106	105	104
Alt F	108	107	107	106	105	104

Effect of Riparian Thinning on 10-decade NPV for each trust

Range of change in NPV as a percent of maximum NPV

1%

Other
State Forest Transfer
University

2%

Capitol Grant
Common School
Normal School
State Forest Purchase

3+%

Agriculture School (3%)
CEPRI (3%)
Scientific School (3%)
Community College (5%)



Effect of Riparian Thinning on 10-decade NPV for each county

Range of change in NPV as a percent of maximum NPV

0%

Clallam

1-2%

Grays Harbor (1%)

Skagit (1%)

Clark (1%)

Jefferson (1%)

King (1%)

Kitsap (1%)

Mason (1%)

Skamania (1%)

Lewis (2%)

Pierce (2%)

Snohomish (2%)

Thurston (2%)

Whatcom (2%)

3+%

Cowlitz (3%)

Pacific (4%)

Wahkiakum (4%)



Effects of Riparian Thinning on individual trusts

10-decade NPV (\$ millions) Common School and Indemnity Trust lands.

Marbled Murrelet LTCS Alt	Arrearage harvest					
	702 MMBF		462 MMBF		Rolled in	
	Riparian thinning					
	10%	1%	10%	1%	10%	1%
Alt A	1,679	1,654	1,679	1,652	1,674	1,638
Alt B	1,711	1,685	1,709	1,683	1,704	1,670
Alt C	1,664	1,639	1,664	1,637	1,655	1,621
Alt D	1,655	1,631	1,655	1,628	1,648	1,614
Alt E	1,659	1,636	1,659	1,633	1,651	1,617
Alt F	1,476	1,456	1,477	1,457	1,477	1,449

Effects of Riparian Thinning on individual counties

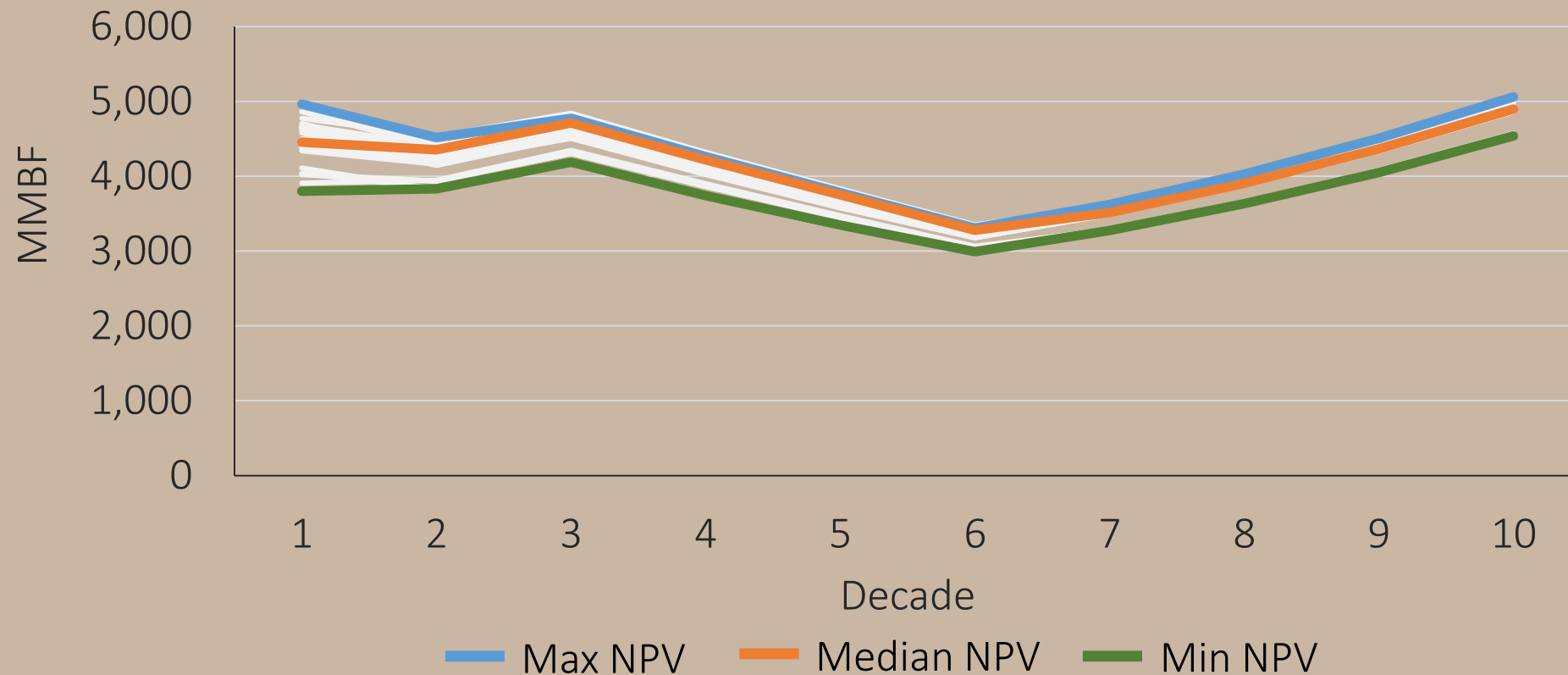
10-decade NPV (\$ millions) State Forest Transfer Trust lands in Pacific County

Marbled murrelet strategy alternative	Arrearage harvest					
	702 MMBF		462 MMBF		No specific level	
	Riparian thinning					
	10%	1%	10%	1%	10%	1%
Alt. A	45	44	45	44	45	44
Alt. B	52	51	52	50	52	50
Alt. C	43	42	43	42	43	41
Alt. D	41	40	41	40	41	40
Alt. E	43	42	43	42	43	41
Alt. F	38	37	38	37	38	37

Harvest volume over time

10-decade harvest level under all scenarios

Scenarios with the maximum, median, and minimum 10-decade NPVs are shown in color



Planning decade timber harvest volume

Planning decade Volume (MMBF/decade) Western Washington.

Marbled Murrelet Strategy Alternative	Arrearage harvest						Decadal rate based on FY 2011-2015 performance
	702 MMBF		462 MMBF		No specific level		
	Riparian thinning						
	10%	1%	10%	1%	10%	1%	
Alt A	4,686	4,704	4,681	4,642	4,497	4,384	4,560
Alt B	4,961	4,926	4,955	4,859	4,772	4,656	
Alt C	4,646	4,653	4,639	4,596	4,455	4,350	
Alt D	4,671	4,666	4,666	4,610	4,483	4,378	
Alt E	4,624	4,638	4,624	4,582	4,441	4,338	
Alt F	4,026	4,110	4,021	4,039	3,910	3,800	

Effect of Murrelet on planning decade Volume for each trust

Range of change in volume as a percent of maximum volume

0%

1- 10%

11+%

Other (2%)

State Forest Purchase (7%)

Community College (8%)

State Forest Transfer (13%)

Capitol Grant (18%)

Scientific School (24%)

Agriculture school (25%)

Common School (27%)

Normal School (30%)

CEPRI (33%)

University (44%)



Effect of Murrelet on planning decade Volume for each county

Range of change in volume as a percent of maximum volume

0%

Kitsap

Mason

1- 10%

Clark (1%)

Cowlitz (1%)

Skamania (1%)

Thurston (5%)

Jefferson (6%)

11+%

Snohomish (12%)

Grays Harbor (13%)

Clallam (17%)

Skagit (18%)

Lewis (19%)

Whatcom (21%)

King (26%)

Pacific (34%)

Pierce (58%)

Wahkiakum (63%)



Effect of Riparian Thinning on planning decade Volume for each trust

Range of change in volume as a percent of maximum volume

0%

Community College

1- 2%

State Forest Purchase (1%)

Normal School (2%)

State Forest Transfer (2%)

University (2%)

2+%

Capitol Grant (3%)

Scientific School (3%)

Other (3%)

CEPRI (4%)

Common School (4%)

Agriculture School (7%)



Effect of Riparian Thinning on planning decade Volume for each county

Range of change in volume as a percent of maximum volume

0%

Mason

1- 2%

Grays Harbor (1%)

Thurston (1%)

Cowlitz (1%)

Pierce (1%)

Jefferson (2%)

King (2%)

Kitsap (2%)

Lewis (2%)

2+%

Clark (3%)

Skagit (4%)

Snohomish (4%)

Skamania (4%)

Clallam (6%)

Pacific (6%)

Whatcom (6%)

Wahkiakum (8%)



Effect of **Arrearage** on planning decade Volume for each trust

Range of change in volume as a percent of maximum volume

0%

1- 10%

10+%

State Forest Transfer (3%)

Capitol Grant (5%)

Other (5%)

Common School (8%)

State Forest Purchase (8%)

CEPRI (11%)

Agriculture school (19%)

Normal School (19%)

Scientific School (19%)

Community College (40%)

University (40%)



Effect of **Arrearage** on planning decade Volume for each county

Range of change in volume as a percent of maximum volume

0%

Kitsap

1- 2%

Grays Harbor (1%)
Skagit (1%)
Snohomish (1%)
Thurston (1%)
Clark (1%)
Cowlitz (1%)
Jefferson (2%)
Lewis (2%)
Mason (1%)
Pierce (1%)

2+%

Pacific (3%)
King (4%)
Skamania (4%)
Clallam (6%)
Whatcom (8%)
Wahkiakum (9%)



Area in production

NOTE | Area in production is different than LTFC, as it incorporates all of Western Washington, as well as a few deferred areas not included in LTFC

Marbled murrelet long-term conservation strategy	Lands managed for forest cover (acres)	Lands where harvest may occur (acres)	Total (acres)
Alternative A	708,000	758,000	1,466,000
Alternative B	700,000	766,000	1,466,000
Alternative C	729,000	737,000	1,466,000
Alternative D	731,000	735,000	1,466,000
Alternative E	732,000	734,000	1,466,000
Alternative F	816,000	650,000	1,466,000

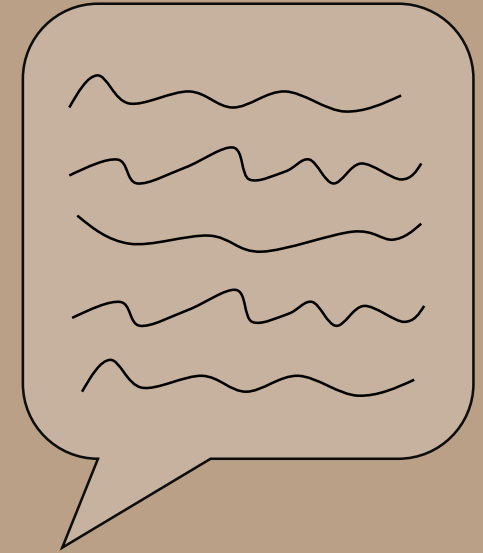
Management Costs

Planning decade Management Costs (\$ millions/year)

Marbled Murrelet Strategy Alternative	Arrearage harvest						Decadal rate based on FY 2011-2015 performance
	702 MMBF		462 MMBF		Rolled in		
	Riparian thinning						
	10%	1%	10%	1%	10%	1%	
Alt A	47	48	47	47	45	44	48
Alt B	50	50	50	49	48	47	
Alt C	47	47	47	46	45	44	
Alt D	47	47	47	46	45	44	
Alt E	46	47	46	46	45	44	
Alt F	41	41	40	41	39	38	

Public Comment

Major Themes



Public Comments - Overarching Themes

Arrearage

- 702 vs. 462 vs. 0

Riparian Thinning

- Higher or Lower

Marbled murrelet

- More conservation is needed
- Conservation is needed in SW Washington
- Recreational activities should be allowed
- Alternative B as suitable option

How to Pick a Preferred Alternative

Arrearage Option

- Be in the best interest of the trust

Riparian Thinning Option

- Be in the best interest of the trust

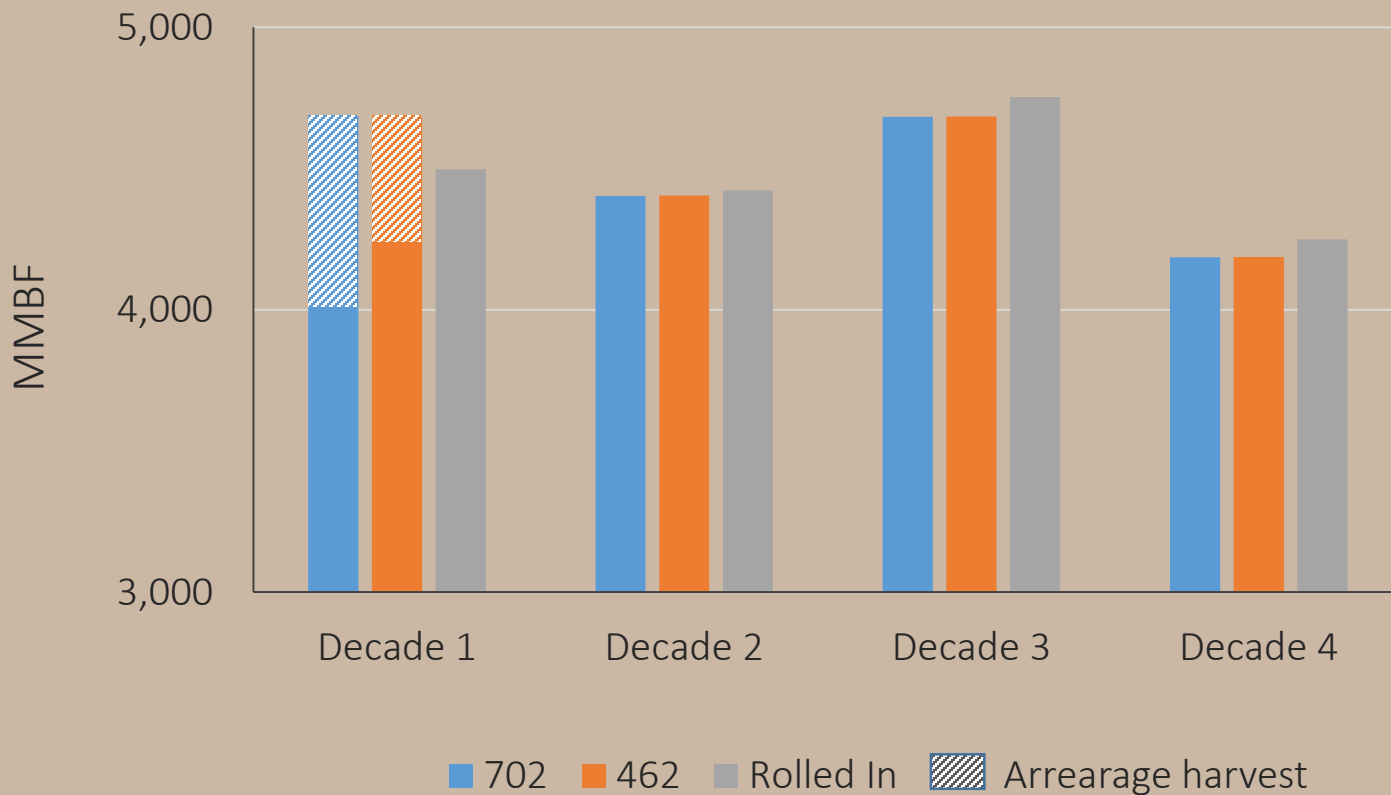
Marbled murrelet Option

- Meet issuance criteria
- Provide a significant contribution
- Be in the best interest of the trust

Arrearage considerations

-short term

Harvest volumes under different arrearage options
(MMLTCS Alt A, Riparian Thinning 10%)



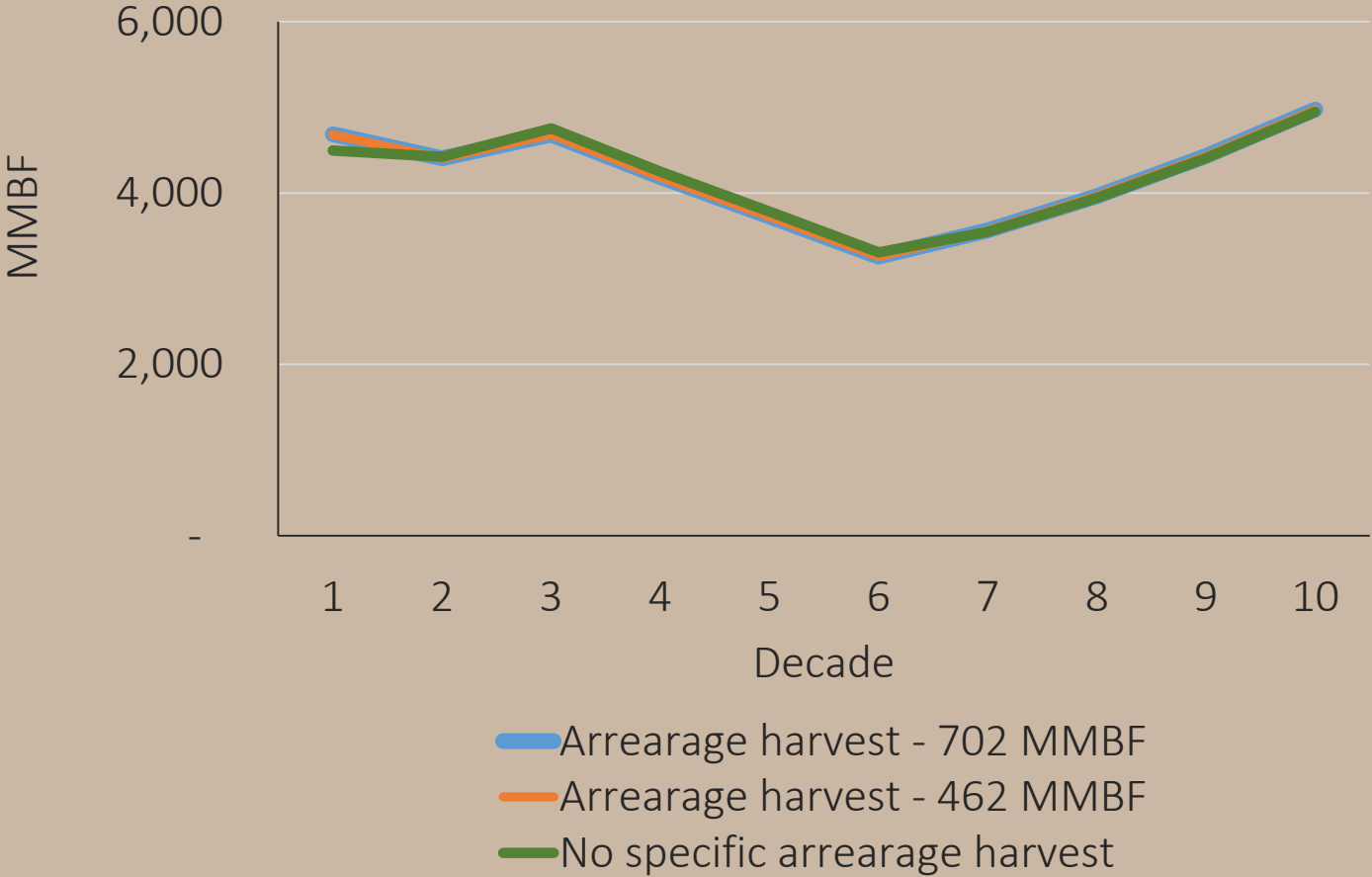
KEY MESSAGES

- To achieve higher volumes in first decade volume must be brought forward from future decades
- Implementation of arrearage harvest will lower the 1st decade Sustainable Harvest Level



Arrearage considerations *-long term*

Western WA harvest volumes

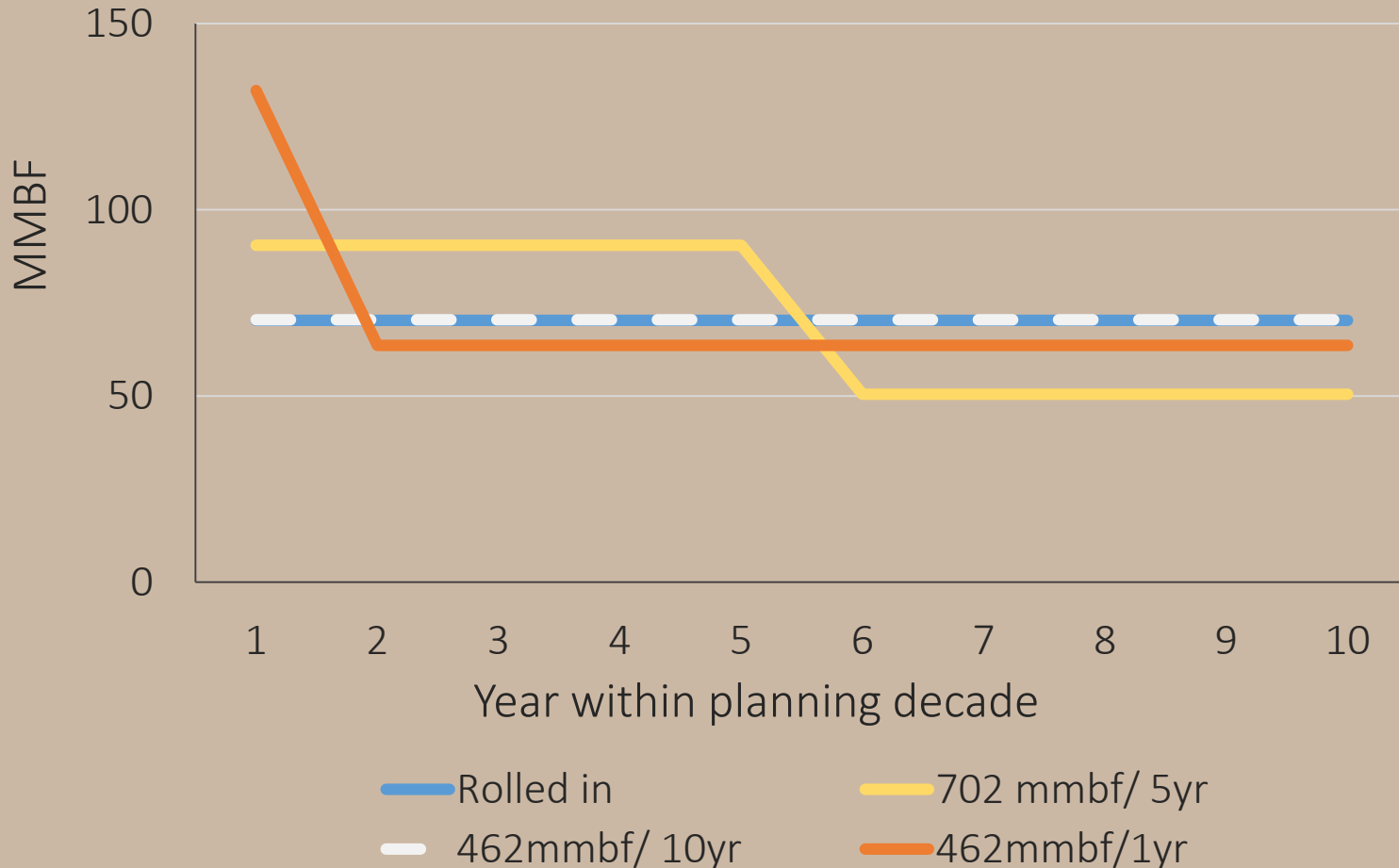


KEY MESSAGES

- Arrearage options do not appear to have significant long-term impacts to sustainable harvest levels

Arrearage considerations -flow

OESF planning decade yearly volume



KEY MESSAGES

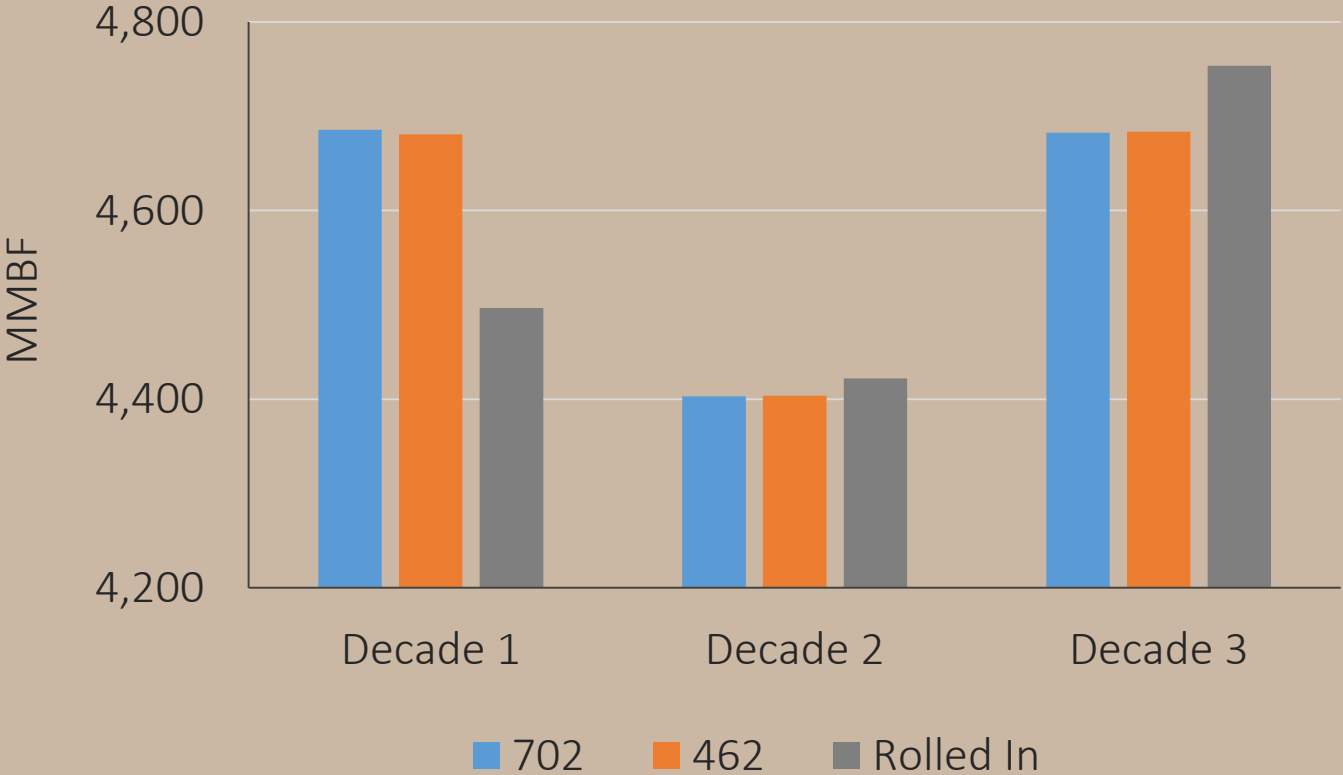
- In arrearage option 462mmbf / 1 year, forester staffing needs in OESF would drop from approximately **33 FTEs to 16 FTEs** between years 1 and 2.

(Based on an estimate of 1 FTE per 4mmbf. This does not include engineering or administrative support)



Arrearage considerations *-flow*

Western WA harvest volumes

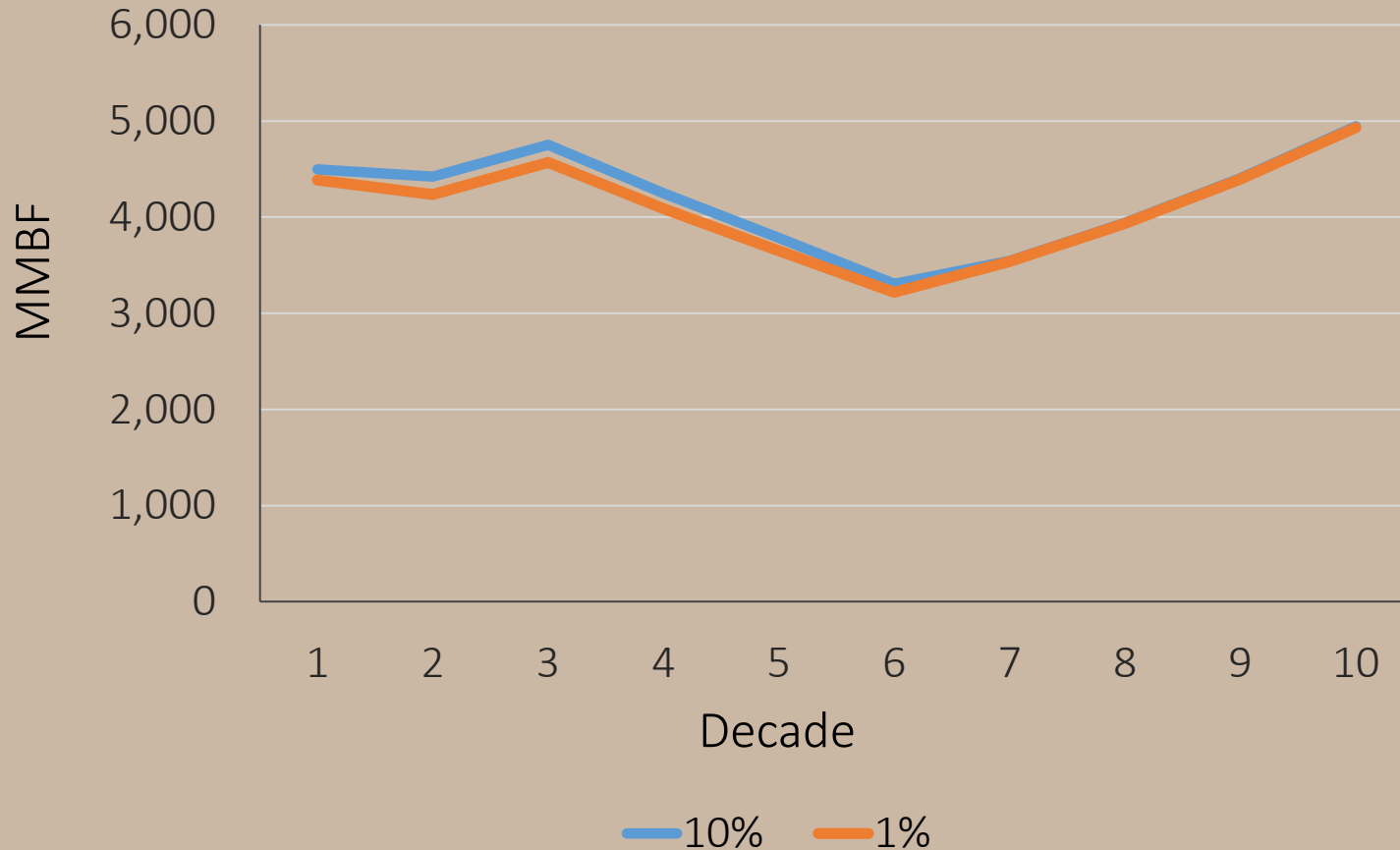


KEY MESSAGES

- In the first 3 decades, the 702 and 462 arrearage options result in greater harvest level variability

Riparian considerations

Western WA harvest volumes



KEY MESSAGES

- Relative impact of 3% in planning decade
- Higher number comes with greater risk of target not being achieved

Public Comments - Overarching Themes

Arrearage

- 702 vs. 462 vs. 0

Riparian Thinning

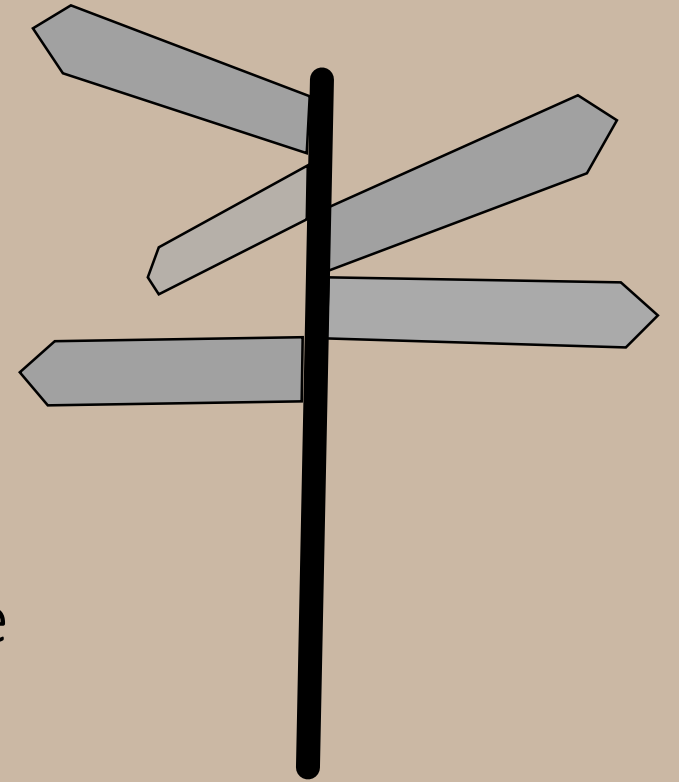
- Higher or Lower

Marbled murrelet

- More conservation is needed
- Conservation is needed in SW Washington
- Recreational activities should be allowed
- Alternative B as suitable option

Proposed Alternatives

ABC	American Bird Conservancy
EPA-E	Environmental Protection Agency
EPA-F	Environmental Protection Agency
PSG	Pacific Seabird Group
WDFW	Washington Department of Fish and Wildlife
Coalition	Marbled Murrelet Coalition



Proposed Alternatives

ABC

American Bird Conservancy

281,000 marbled murrelet specific conservation acres

- + Conserves all current and future habitat
- + Add Alternatives E's EAs and SHAs to Alternative F
- + 150m buffers on Old Forest in the OESF and all occupied sites



Proposed Alternatives

EPA-E

Environmental Protection Agency

110,000 marbled murrelet specific conservation acres

Modified Alt. E to include:

+ Addition of all MMMAs from Alt. F



Proposed Alternatives

EPA-F

Environmental Protection Agency

274,000 marbled murrelet specific conservation acres

Modified Alt. F to include:

- + No harvest in occupied sites, of current habitat, or of future habitat
- + All SHAs and EAs from other alternatives
- + Land identified for conservation under Alternative A



Proposed Alternatives

PSG

Pacific Seabird Group

523,000 marbled murrelet specific conservation acres

Modified Alt. F to include:

- + No harvest in occupied sites, of current habitat, or of future habitat
- + 150 m buffers on occupied sites, suitable (current and future) habitat, old forest habitat, SHAs and EAs
- + All SHAs and EAs from Alt. E



Proposed Alternatives

WDFW

Washington Department of Fish and Wildlife
88,000 marbled murrelet specific conservation acres

Modified Alt. E to include:

- + 100m buffers on all occupied sites
- + MMMAs from Alt. F in the OESF and four MMMAs from the NPPU
- + Habitat identified by USFWS/WDFW as HQ (20 polygons, 1,506 acres)

Proposed Alternatives

Coalition

Marbled Murrelet Coalition

279,000 marbled murrelet specific conservation acres

Modified Alt. F to include:

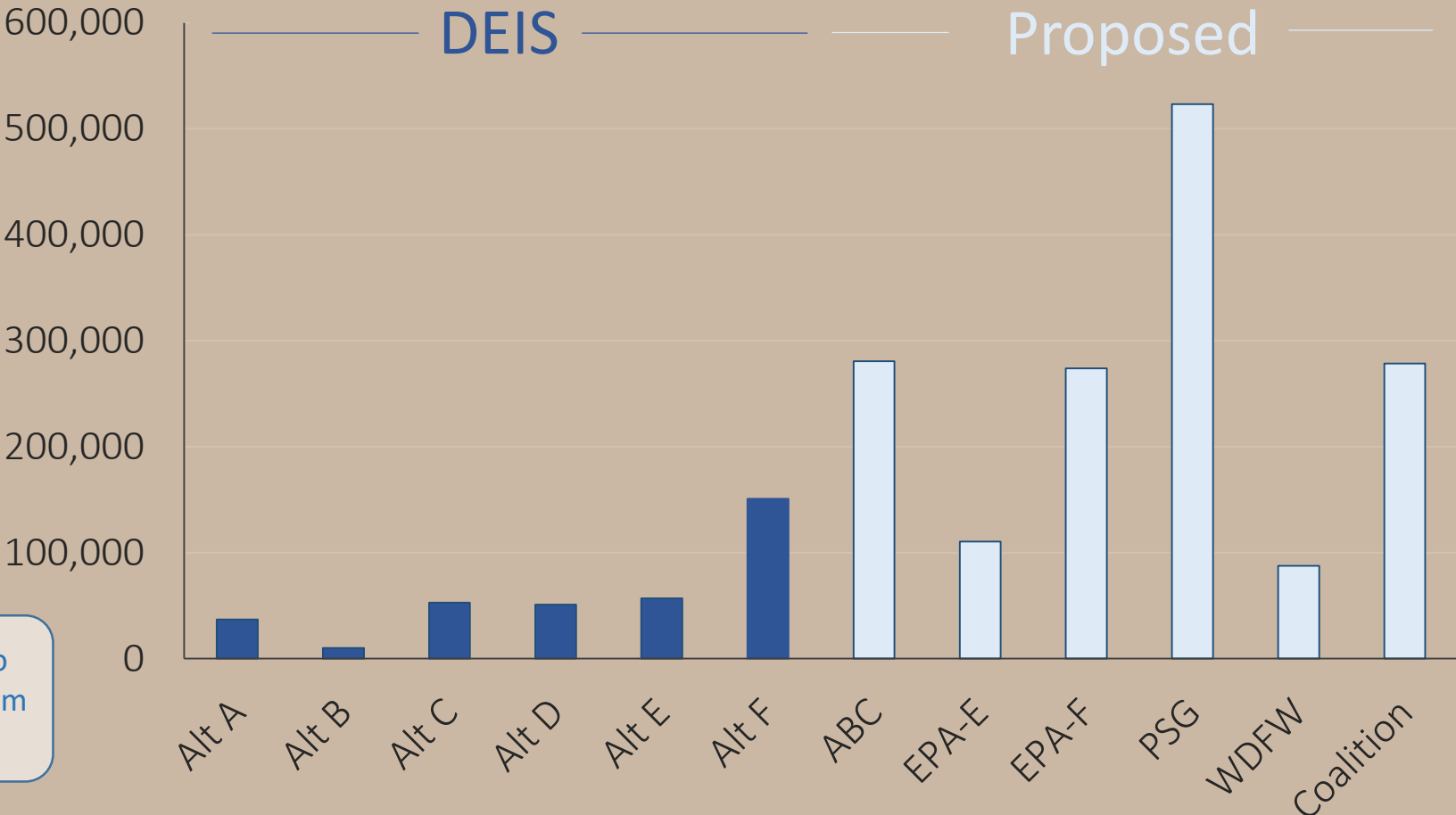
- + No harvest of current or future habitat
- + All EAs and SHAs from Alt. E
- + No managed 150m buffers on Old Forest in the OESF and all occupied sites



Proposed Alternatives

The six proposed alternatives were received as comments during the DEIS public comment period.

Marbled murrelet specific conservation (acres)

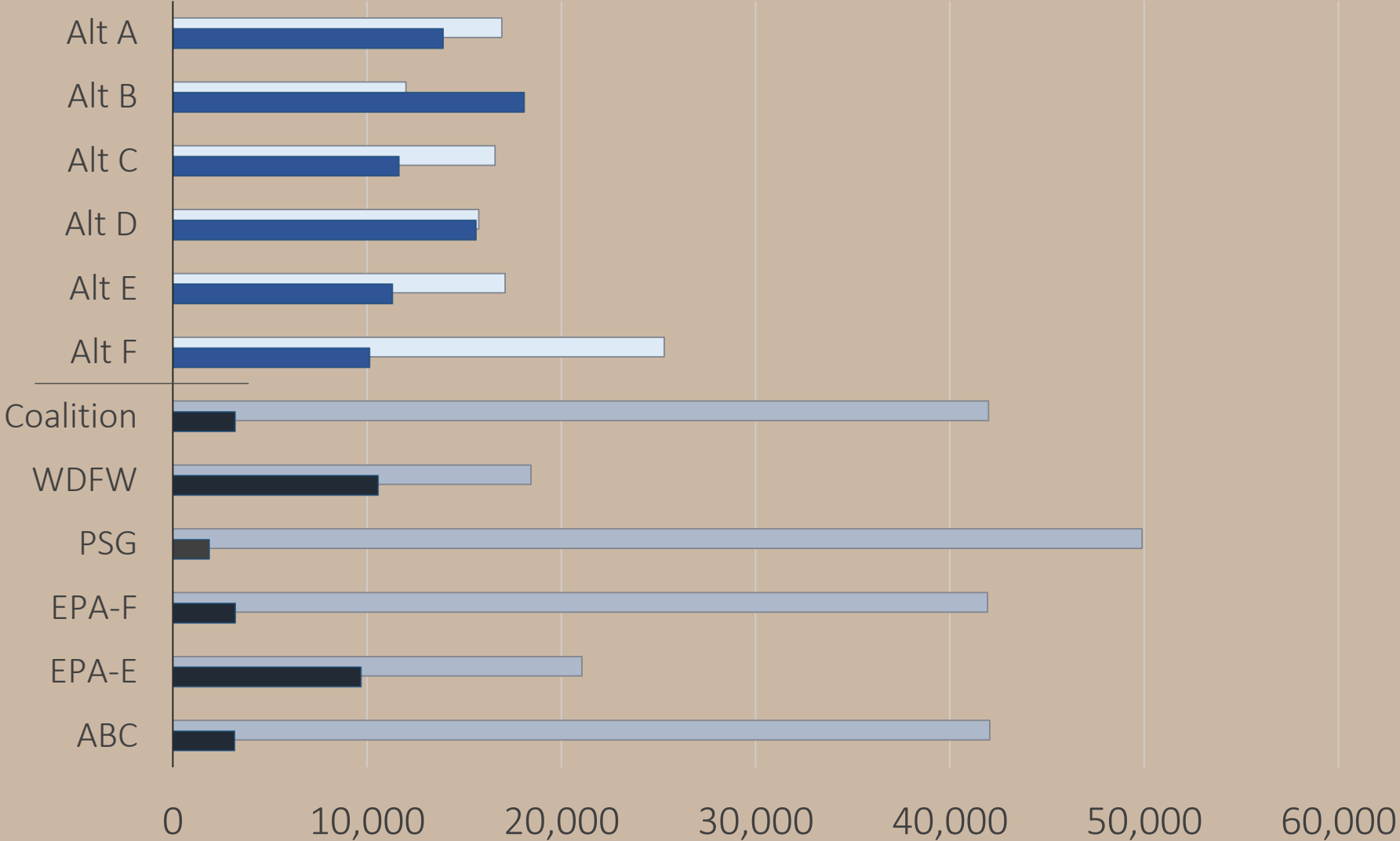


NOTE | These acres are in addition to the 583,000 acres of long-term forest cover

Proposed Alternatives

DEIS Alternatives

- Mitigation
- Impact

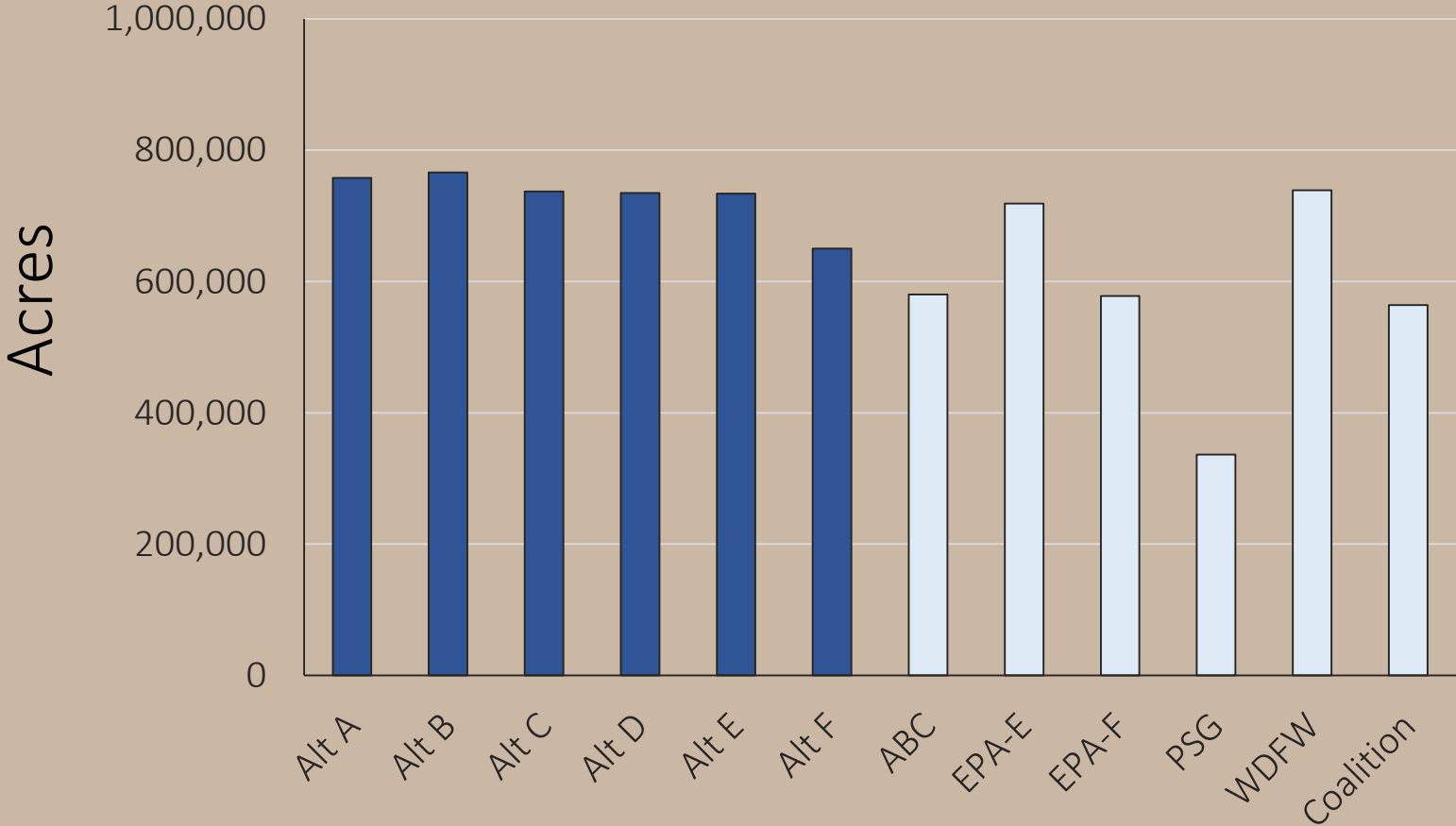


Proposed Alternatives

- Mitigation
- Impact

Proposed Alternatives

Lands where harvest may occur



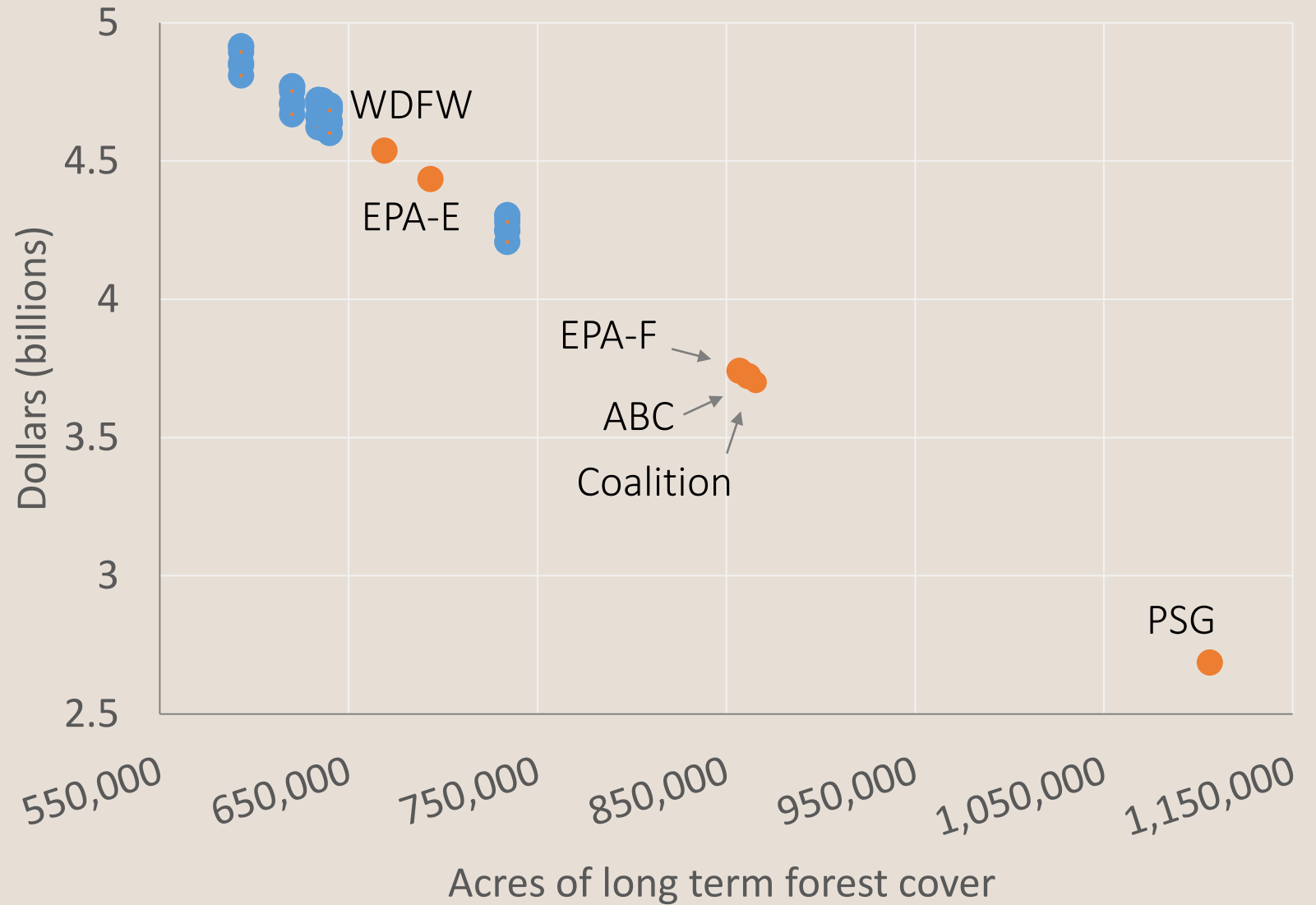
NOTE

DNR-manages ~ 1.4 million acres of state trusts forest lands in western Washington.

Western WA 10-Decade NPV

Each circle represents one combination of murrelet, arrearage, and riparian options.

Orange circles represent estimated NPV of the proposed alternatives based upon LTFC value



Summary of MM Comments

Key messages from the proposed alternatives

- Lower the impact on the species (minimization)
- Increase the mitigation
- Alternative B suitability

Key outcomes

- Amount of mitigation far exceeds impact
- Financial impact to the trusts and the Department exceeds Alt. F
- Goal of HCP should be to fully offset the impacts of take

How to Pick a Preferred Alternative

Arrearage Option

- Be in the best interest of the trust— *ensure guiding trust principles are met*

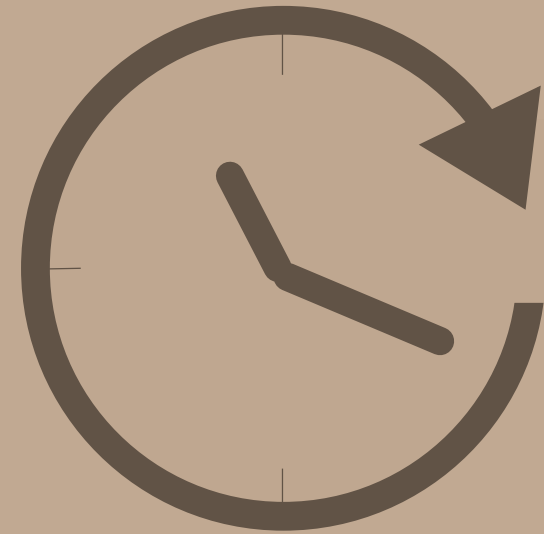
Riparian Thinning Option

- Be in the best interest of the trust— *ensure guiding trust principles are met*

Marbled murrelet Option

- Meet issuance criteria – *balance impact and mitigation*
- Provide a significant contribution – *outcome of the conservation strategy*
- Be in the best interest of the trust – *ensure guiding trust principles are met*

Timeline



Preferred alternative timeline

- ✓ April: Summary of public comments
- ✓ May: MM/SHC background and deferral summary
- ✓ June: MMLTCS/Arrearage/Riparian and decision process
- ✓ July: Financial analysis and proposed alternatives
- August: 2-day BNR retreat
- September: BNR selects a preferred MMLTCS alternative

