



KNRAMP August Advisory Team Workshop

Scenario prioritization for Curley and Kinman Creek

WCAEF

Overall Score Scale Reminder

Assets	Attributes	Condition Rating				
		Very Low	Low	Medium	High	Very High
Forest	Forest Cover (%)	<40%	40%-55%	55%-70%	70%-85%	>85%
	Mature Forests (%)	<20%	20%-40%	40%-60%	60%-80%	>80%
Marine Shorelines	Shoreline Armoring (%)	>75%	50%-75%	25%-50%	1%-25%	<1%
	Shoreline Vegetation (%)	<40%	40%-55%	55%-70%	70%-85%	>85%
	Shellfish Growing Areas (SGA commercial classification)	Prohibited	Prohibited & Conditional /Approved	Conditional	Conditional & Approved	Approved
Streams	Riparian Vegetation (%)	<40%	40%-55%	55%-70%	70%-85%	>85%
	B-IBI Score	0-20	20-40	40-60	60-80	80-100
	Water Quality (Water Quality tests)	Fails both	n/a	Passes 1 st , fails 2 nd	n/a	Passes both
	Fish Passage Barriers	5+ (presence of 0% passable barrier)	3-4 (presence of 0% passable barrier)	1-2 (no 0% passable barrier)	0 (with presence of 100% passable barrier)	0 (no 0% passable barrier)
Cartegraph Level Of Service Score		0-20	20-40	40-60	60-80	80-100

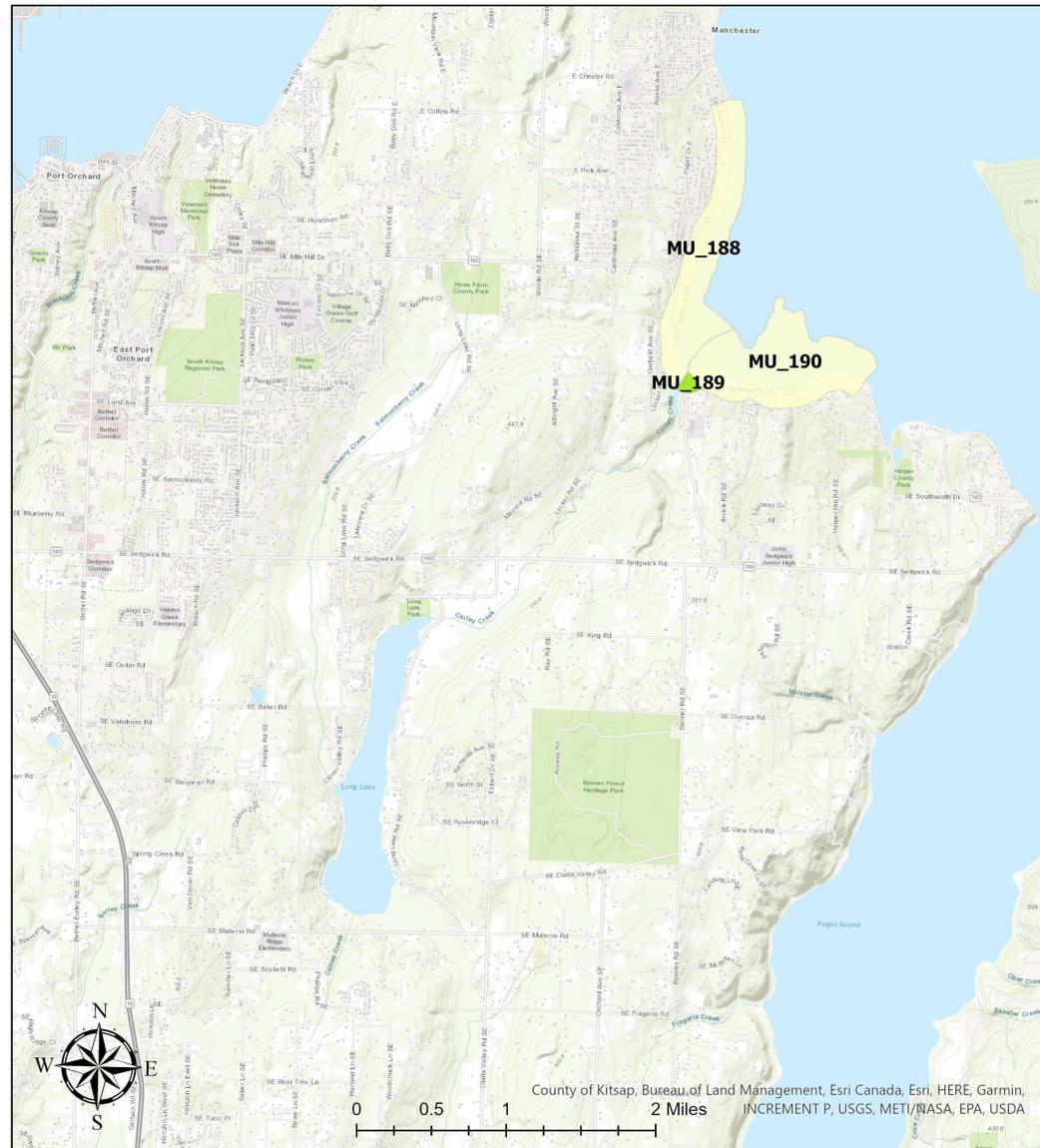
Desired Level of Service Goal

LOS Condition Rating	Very Low	Low	Medium	High	Very High
<i>Cartegraph Level Of Service Score</i>	<i>0-20</i>	<i>20-40</i>	<i>40-60</i>	<i>60-80</i>	<i>80-100</i>

- Shorelines and Streams – All management units at or above "High" level of service.
- Forests – Weighted average* within a watershed at or above "High" level of service

*Forest asset LOS and DLOS was set at the weighted average based on the management unit size across a watershed.

Curley Creek Creek Shorelines



Legend

- High
- Medium

Curley Creek Watershed

Curley Creek Shorelines

- ▶ MU_188 and MU_190 currently below DLOS

MU_ID	% Shoreline Vegetation	% Shoreline Armoring	Shellfish Growing Area Classification	Overall Score
MU_188	37%	94%	Approved	41.2
MU_190	34%	95%	Approved	40.4

Curley Creek Shorelines

► Scenario 1 - remove shoreline armoring

- Goal - to improve forage fish habitat and natural sediment transport

MU_ID	Current Armor Score	Current Overall Score	Action	Resulting Armor Score	Resulting Overall Score
MU_188	5.2	41.2	Remove 6,800ft of shoreline armoring	62.5	60.6
MU_190	3.9	40.4	Remove 5,400ft of shoreline armoring	64.2	60.4

Potential Partners: Shore Friendly, Roads or WSDOT?

Curley Creek Shorelines

► Scenario 2 - improve shoreline vegetation

- Goal - increase shade and large woody debris to improve nearshore habitats

MU_ID	Current Shoreline Vegetation Score	Current Overall Score	Action	Resulting Shoreline Vegetation Score	Resulting Overall Score
MU_188	18.6	41.2	Plant 4,200ft of shoreline vegetation	76.0	60.4
MU_190	17.1	40.4	Plant 3,500 ft of shoreline vegetation	77.3	60.4

Potential Partners: Shore Friendly, Roads or WSDOT?

Curley Creek Shorelines

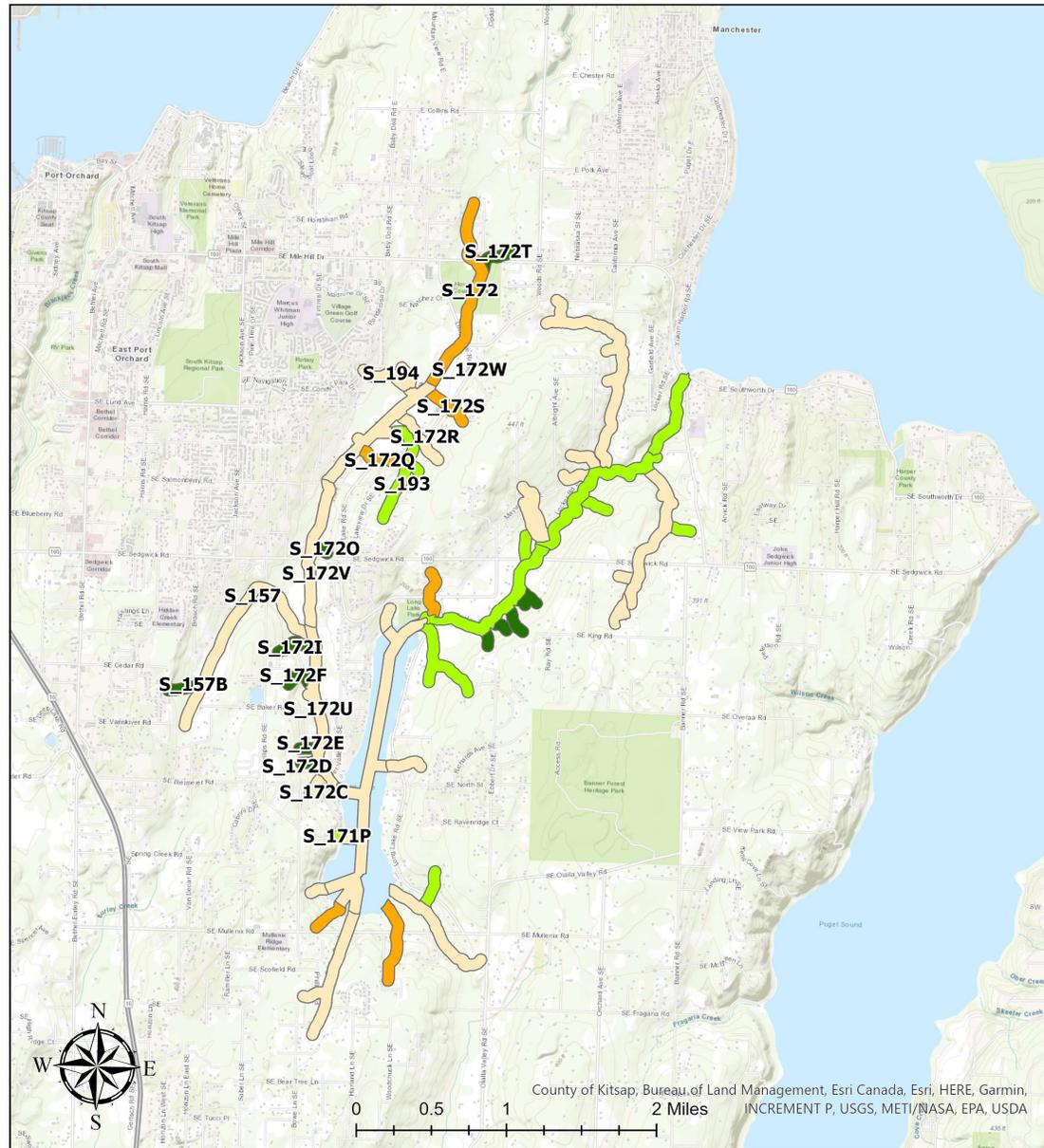
► Scenario 3 - Combination Scenario: Reduce armoring and improve shoreline vegetation

- Goal - improve forage fish habitat, sediment transport, and nearshore habitats

MU_ID	Current Shoreline Vegetation Score	Current Shoreline Armoring Score	Current Overall Score	Action	Resulting Shoreline Vegetation Score	Resulting Shoreline Armoring Score	Overall Score
MU_188	18.6	5.2	41.2	Plant 1,600ft of shoreline veg and remove 4,200ft armoring	40.0	40.0	60.0
MU_190	17.1	3.9	40.4	Plant 1,500 ft of shoreline veg and remove 3,200 ft armoring	40.0	40.0	60.0

Potential Partners: Shore Friendly, Roads or WSDOT?

Curley Creek Streams



Legend

- Very High
- High
- Medium
- Low
- Very Low

Curley Creek Watershed

Curley Creek Streams

- ▶ 10 of 17 stream units in Salmonberry Creek below DLOS

MU_ID	% Riparian – full number	BIBI Score – full number	WQ Test	Fish Passage Barriers	Overall Score
S_157	74%	n/a	n/a	1 full	47.3
S_172	58%	n/a	n/a	1 full, 4 partial	22.0
S_194	85%	43.5	n/a	1 full	51.1
S_172C	86%	n/a	n/a	1 full	55.8
S_172Q	50%	43.5	n/a	1 full	35.6
S_172R	49%	43.5	n/a	None	58.4
S_172S	52%	43.5	n/a	3 full	26.7
S_172U	61%	n/a	n/a	1 partial	49.2
S_172V	59%	43.5	n/a	1 partial	46.0
S_172W	16%	43.5	n/a	none	50.4

Curley Creek Streams

- ▶ Scenario 4 - improve riparian cover on main segments of Salmonberry Creek
 - ▶ Goal - improve shade to provide salmon with cool water in Salmonberry Creek

MU_ID	Current Riparian Score	Current Overall Score	Action	Resulting Riparian Score	Resulting Overall Score
S_172	43.9	22.0	Plant 2,300ft of riparian vegetation	86.7	43.3
S_172U	48.3	49.2	Plant 1,100ft of riparian vegetation	73.3	61.7
S_172V	44.5	46.0	Plant 1,600ft of riparian vegetation	86.7	60.0
S_172W	7.9	50.4	Plant 1,900ft of riparian vegetation	40.0	61.2

Potential Partners: KCD, GPC, Parks

Curley Creek Streams

- ▶ Scenario 5 - Remove full blockage fish passage barriers
 - ▶ Goal - improve fish passage and allow salmon to reach healthy tributaries further up in the watershed.

MU_ID	Current Fish Passage Barrier Score	Current Overall Score	Action	Resulting Fish Passage Barrier Score	Resulting Overall Score
S_157	30	47.3	Remove 1 full barrier	100	82.3
S_172	0	22.0	Remove 1 full barrier	30	37.0
S_194	30	51.1	Remove 1 full barrier	100	74.5
S_172C	30	55.8	Remove 1 full barrier	100	90.8
S_172Q	30	35.6	Remove 1 full barrier	100	58.9
S_172S	0	26.7	Remove 3 full barriers	100	60.0

Potential Partners: Roads, WSDOT, KCD, GPC

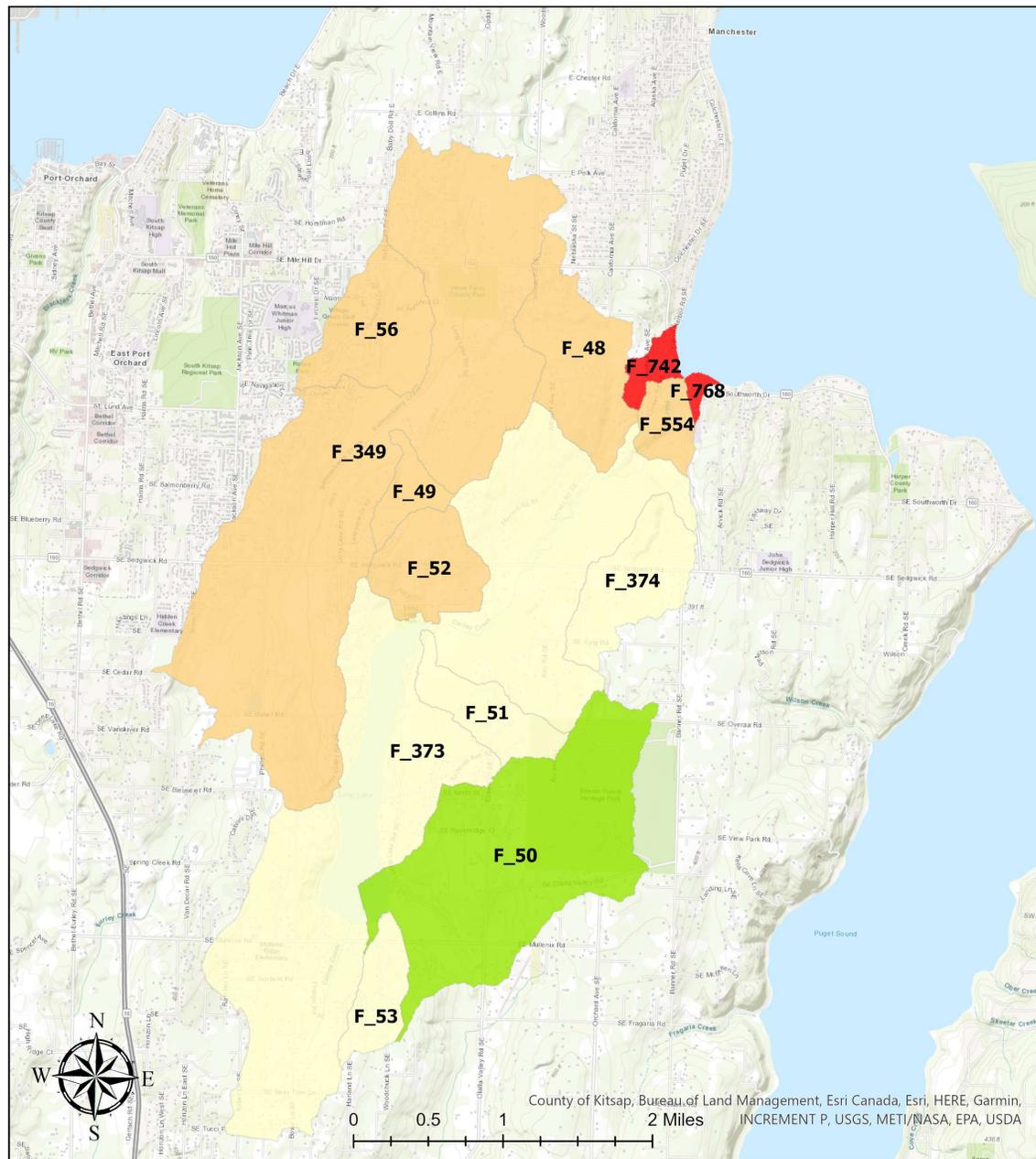
Curley Creek Streams

- ▶ Scenario 6 - Combination Scenario - Improve riparian vegetation and remove fish passage barriers to achieve DLOS in the main segments of Salmonberry Creek.
 - ▶ Goal - improve fish access to upper tributaries and provide the stream with cool water by improving shade.

MU_ID	Current Riparian Score	Current Fish Passage Score	Current Overall Score	Action	Resulting Riparian Score	Resulting Fish Passage Score	Resulting Overall Score
S_172	43.9	0	22.0	Plant 1,800ft of riparian vegetation + remove 1 full barrier & 2 partial barriers	73.3	50	61.7
S_172U	48.3	50	49.2	Plant 1,100ft of riparian vegetation	73.3	50	61.7
S_172V	44.5	50	46.0	Plant 1,600ft of riparian vegetation	86.7	50	60.0
S_172W	7.9	100	50.4	Plant 1,900ft of riparian vegetation	40.0	100	61.2

Potential Partners: Roads, WSDOT, KCD, GPC, Parks

Curley Creek Forests



Legend

- High
- Low
- Medium
- Very Low

Curley Creek Watershed

Curley Creek Forests

MU_ID	% Forest Cover	% Mature Forest Cover	Overall Score
F_48	77%	0%	34.4
F_49	77%	0.2%	37.1
F_50	80%	33%	60.0
F_51	80%	17.8%	53.9
F_52	59%	0%	23.0
F_53	72%	1.7%	41.5
F_54	69%	0%	29.4
F_56	58%	3.1%	33.1
F_349	66%	2.1%	37.6
F_373	74%	1.6%	43.1
F_374	78%	3.7%	46.5
F_554	70%	0.5%	35.2
F_742	48%	0%	15.1
F_768	22%	0%	5.5

*Forest asset LOS and DLOS was set at the weighted average based on the management unit size across a watershed.

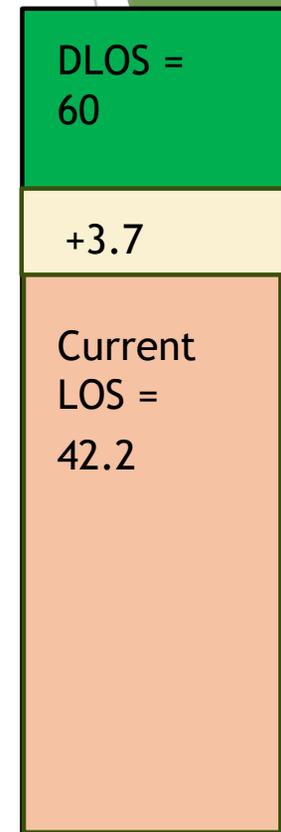
***Weighted Overall Score**

42.2

Curley Creek Forests

- ▶ Scenario 7 - Improve mature forest cover to 25% in all MUs near Salmonberry Creek to improve cool groundwater
 - ▶ Goal - improve hydrologic maturity of the watershed to provide cool water to Salmonberry creek via groundwater.

MU_ID	Current Mature Forest Cover Score	Action	Resulting Mature Forest Score
F_49	4.6	Acquire/protect 27.4 acres of mature forest	40.0
F_54	0.0	Acquire/protect 35 acres of mature forest	40.0
F_56	21.8	Acquire/protect 81 acres of mature forest	40.0
F_349	20.9	Acquire/protect 614 acres of mature forest	40.0



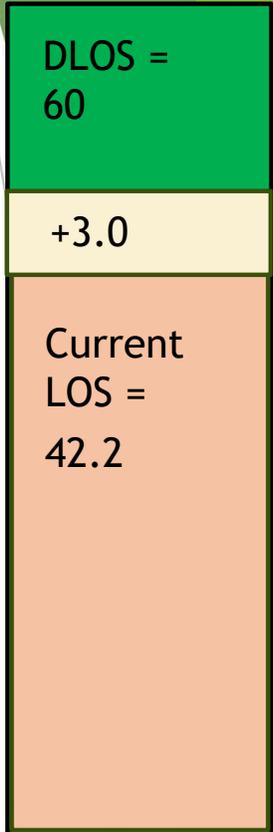
Total Action Acres	757.4 acres	Weighted Overall Score	45.9
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Potential Partners: Parks, KCD, GPC, DNR

Curley Creek Forests

- Scenario 8 - Improve forest cover to 75% in all MUs currently below
 - Goal - improve overall forest cover to improve groundwater intrusion and cool water reaching the stream

MU_ID	Current Forest Cover Score	Action	Resulting Forest Cover Score
F_52	45.9	43.5 acres	66.7
F_53	62.4	5.5 acres	66.7
F_54	58.8	8.3 acres	66.7
F_56	44.5	61.6 acres	66.7
F_349	54.4	246.7 acres	66.7
F_373	65.7	20.1 acres	66.7
F_554	59.6	6.4 acres	66.7
F_742	30.1	18.7 acres	66.7
F_768	11.0	11.5 acres	66.7



Total Action Acres	422.3 acres	Weighted Overall Score	45.2
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Potential Partners: Parks, KCD, GPC, DNR

Curley Creek Forests

- ▶ Scenario 9 - Combination Scenario - Focus efforts around Salmonberry Creek by improving forest cover to 75% and mature forest to 25%
 - ▶ Goal - improve hydrologic maturity and overall groundwater intrusion to provide cool water to Salmonberry Stream

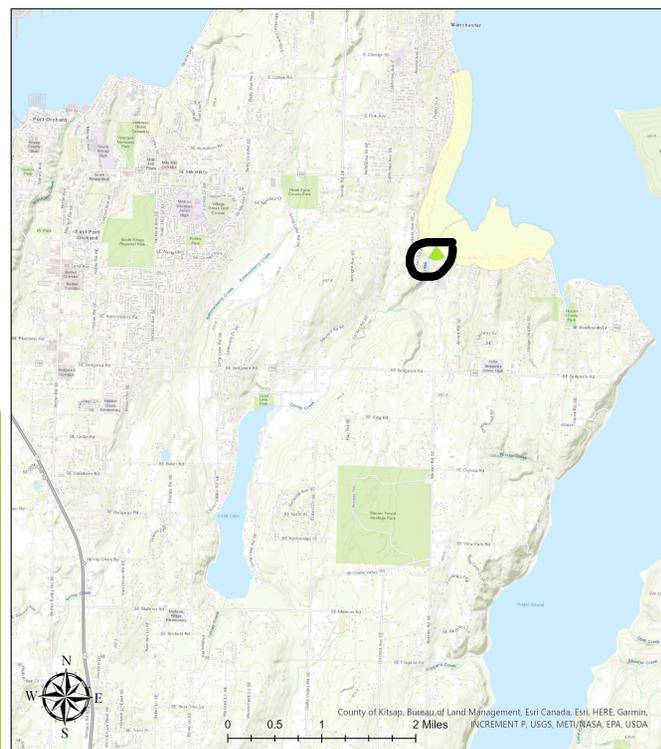
MU_ID	Current Forest Cover Score	Current Mature Forest Cover Score	Action	Resulting Forest Cover Score	Resulting Mature Forest Cover Score
F_49	69.6	4.6	Acquire/protect 27.4 acres of mature forest	69.6	40.0
F_54	58.8	0.0	Acquire and protect 35 acres of mature forest + plant 8.3 acres of forest	66.7	40.0
F_56	44.5	21.8	Acquire/protect 81 acres of mature forest + plant 61.6 acres of forest	66.7	40.0
F_349	54.4	20.9	Acquire/protect 614 acres of mature forest + plant 246.7 acres of forest	66.7	40.0

DLOS = 60
+6.0
Current LOS = 42.2

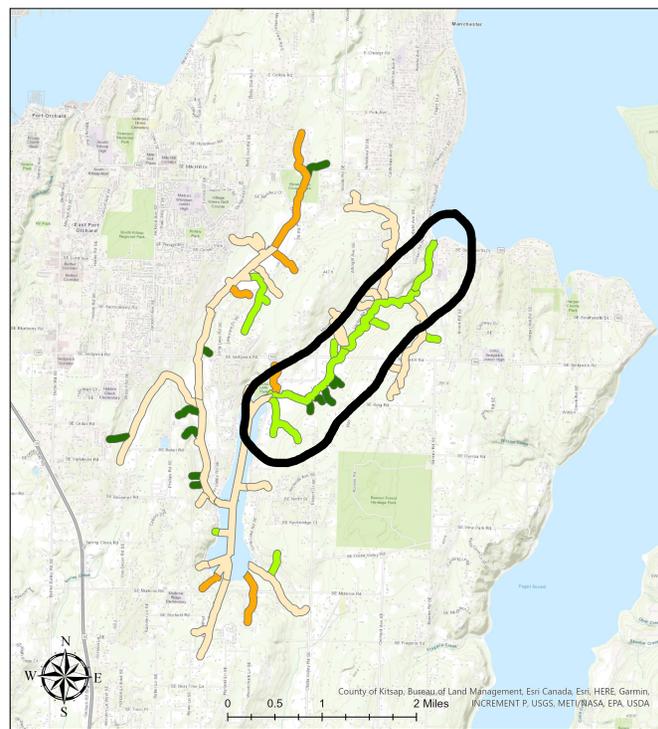
Total Action Acres	1073.4 acres	Weighted Overall Score	48.2
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Potential Partners: Parks, KCD, GPC, DNR

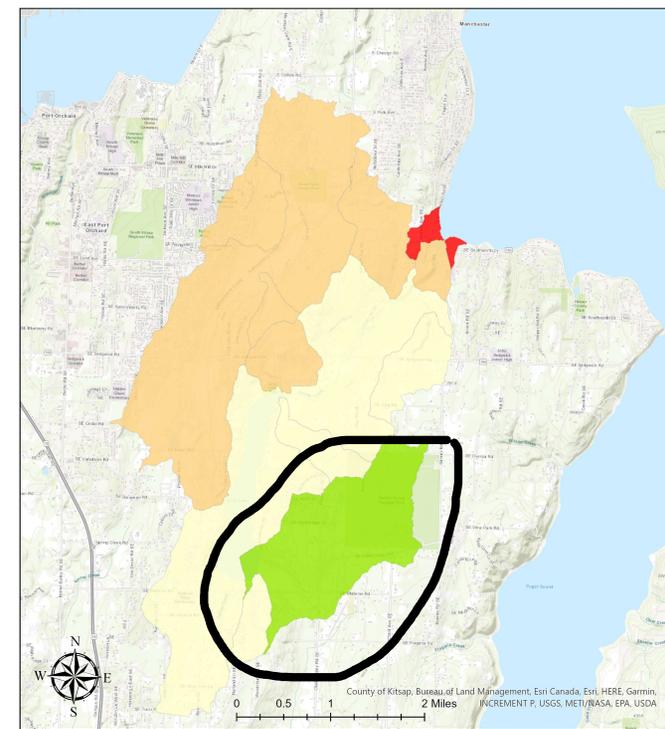
Curley Creek Watershed Areas to Protect



Curley Creek Watershed



Curley Creek Watershed

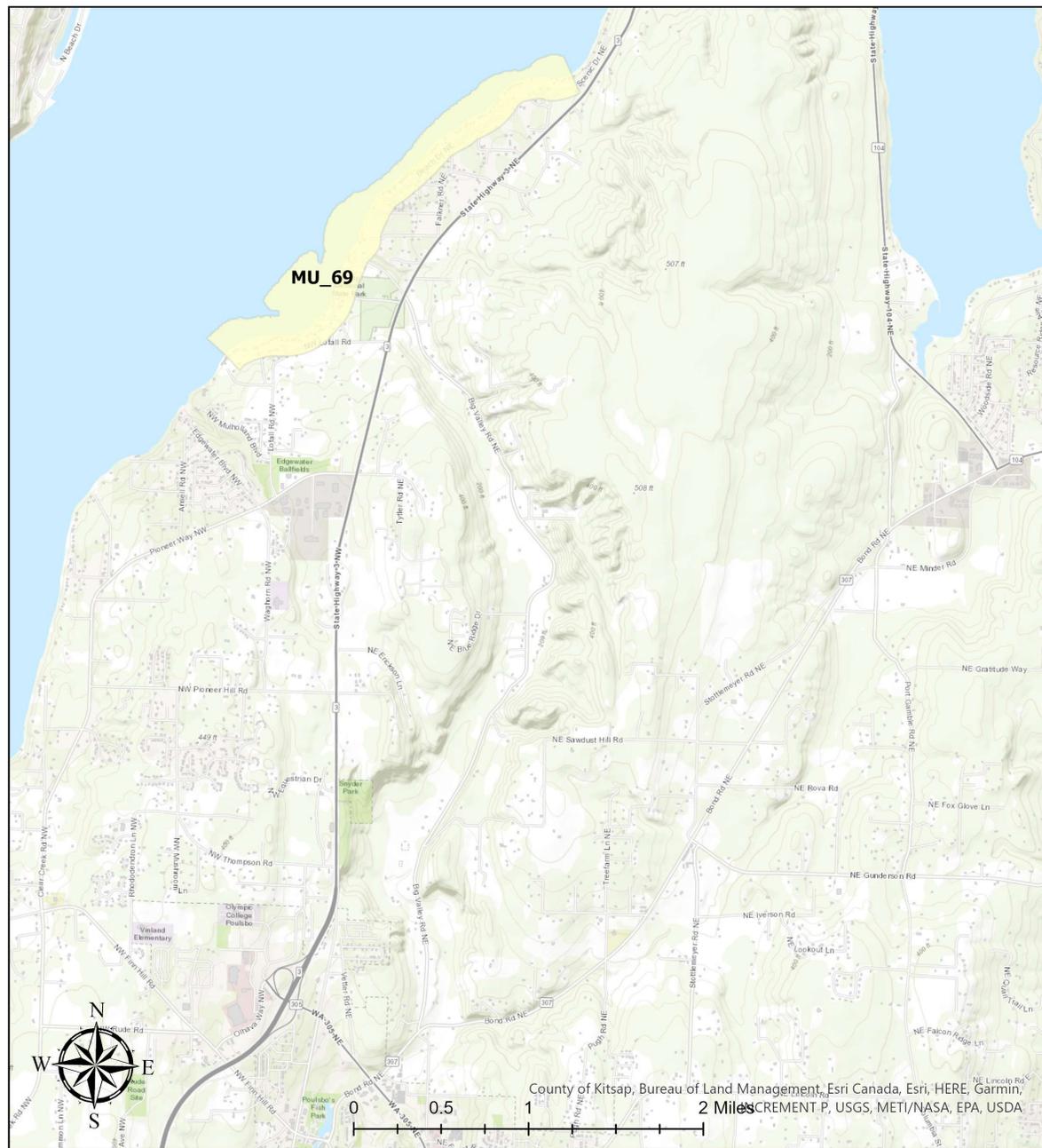


Curley Creek Watershed

Scenario Review - Curley Creek

Scenario	Asset	Action	LOS Improvement
1	Shoreline	Decrease armoring by removing 10,200ft	+19.6
2	Shoreline	Improve shoreline vegetation by planting 7,700ft	+19.6
3	Shoreline	Remove 7,400ft of armoring and plant 3,100ft of shoreline vegetation	+19.2
4	Stream	Improve riparian cover in Salmonberry Creek by planting 6,900ft	+15.7
5	Stream	Remove 8 full blockage fish passage barriers across four MUs	+27.5
6	Stream	Improve riparian cover by planting 6,400ft and remove 1 full blockage fish barrier and 2 partial barriers	+19.3
7	Forest	Increase mature forest cover by acquiring/protecting 757 acres	+3.7
8	Forest	Improve forest cover by planting/protecting 422 acres	+ 3.1
9	Forest	Improve forest cover by planting/protecting 316 acres and mature forest by acquiring/protecting 757 acres)	+ 6

Kinman Creek - Shorelines



Legend
Medium

Kinman Creek Watershed

Kinman Creek - Shorelines

MU_ID	% Shoreline Vegetation	% Shoreline Armoring	Shellfish Growing Area Classification	Overall Score
MU_69	40%	47%	Approved	54.1

Kinman Creek - Shorelines

- ▶ Scenario 1 - Remove shoreline armoring
 - ▶ Goal - improve forage fish habitat and sediment transport

MU_ID	Current Armor Score	Current Overall Score	Action	Resulting Armor Score	Resulting Overall Score
MU_69	42.1	54.1	Remove 3,200ft of shoreline armoring	60.0	60.1

Potential Partners: Shore Friendly, Parks, GPC

Kinman Creek - Shorelines

► Scenario 2 - improve shoreline vegetation

- Goal - improve shade and large woody debris to improve nearshore habitats

MU_ID	Current Shoreline Vegetation Score	Current Overall Score	Action	Resulting Shoreline Vegetation Score	Resulting Overall Score
MU_69	20.2	54.1	Plant 2,100ft of shoreline vegetation	40.0	60.7

Potential Partners: Shore Friendly, Parks, GPC

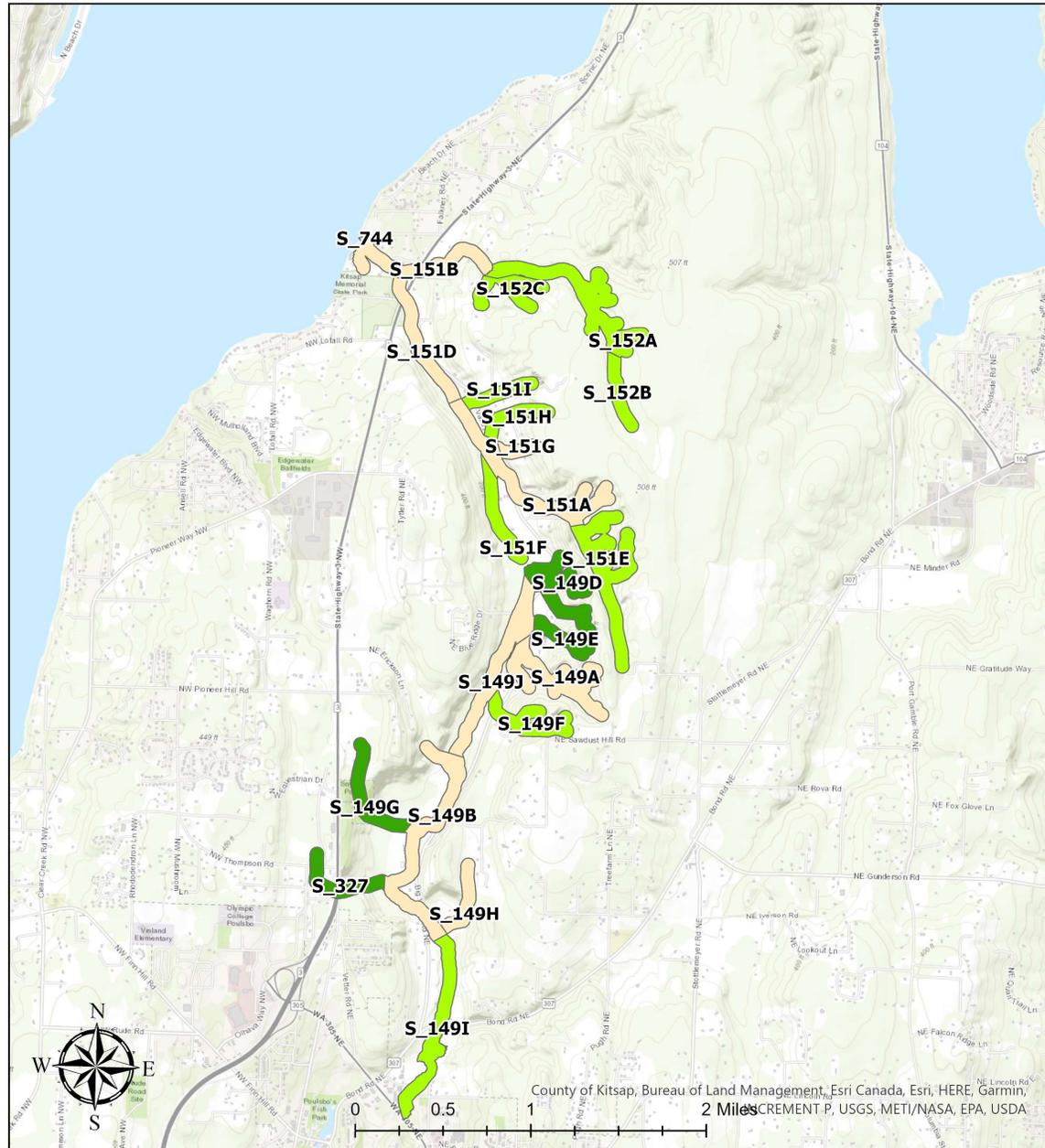
Kinman Creek - Shorelines

- ▶ Scenario 3 - Combination of 1 and 2: Armor removal and shoreline vegetation improvement
 - ▶ Goal - improve forage fish habitat, sediment transport, shade, and large woody debris inputs

MU_ID	Current Armor Score	Current Shoreline Vegetation Score	Current Overall Score	Actions	Resulting Armor Score	Resulting Shoreline Vegetation Score	Resulting Overall Score
MU_69	42.1	20.2	54.1	Remove 1,800ft of shoreline armoring and plant 1,100ft of shoreline vegetation	52.0	30.7	60.9

Potential Partners: Shore Friendly, Parks, GPC

Kinman Creek Streams



Legend

- Medium
- High
- Very High

Kinman Creek Watershed

Kinman Creek Streams

► 9 of 22 stream units below DLOS

MU_ID	% Riparian	BIBI Score	WQ Test	Fish Passage Barriers	Overall Score
S_149B	35%	51.53	Pass both	1 full, 7 partial	42.5
S_151A	62%	n/a	Fail pt 2	1 full, 1 partial	43.1
S_744	3.9%	n/a	Fail pt 2	None	50.6
S_151B	71%	59.1	Fail pt 2	3 full, 1 partial	42.8
S_151D	66%	59.1	Fail pt 2	1 full	48.3
S_149A	79%	26.5	Pass both	1 full, 1 partial	57.2
S_149H	68%	76.57	Pass both	2 full	58.6
S_149J	76%	26.5	Pass both	3 full, 3 partial	49.0
S_151G	85%	n/a	Fail pt 2	1 partial	59.9

Kinman Creek

Dogfish Creek

Kinman Creek Streams

- ▶ Scenario 4 - Remove full blockage barriers
 - ▶ Goal - improve fish passage to allow salmon to reach healthy upper tributaries

MU_ID	Current Fish Passage Score	Current Overall Score	Action	Resulting Fish Passage Score	Resulting Overall Score
S_151A	30	43.1	Remove 1 full barrier	50	49.7
S_151B	1	42.8	Remove 3 full barriers	50	55.0
S_151D	30	48.3	Remove 1 full barrier	100	65.8
S_149A	30	57.2	Remove 1 full barrier	50	62.2
S_149H	1	58.6	Remove 2 full barriers	100	83.4
S_149J	1	49.0	Remove 3 full barriers	30	56.2

Potential Partners: Kitsap County Roads, KCD, WSDOT

Kinman Creek Streams

- ▶ Scenario 5 - PIC Program to improve water quality in Kinman Creek
 - ▶ Goal - address water quality issues to improve B-IBI and overall watershed health

MU_ID	Current Water Quality Score	Current Overall Score	Action	Resulting Water Quality Score	Overall Score
S_151A	50 (fails pt 2)	43.1	PIC Program	100	59.7
S_744	50 (fails pt 2)	50.6	PIC Program	100	67.3
S_151B	50 (fails pt 2)	42.8	PIC Program	100	55.3
S_151D	50 (fails pt 2)	48.3	PIC Program	100	60.8
S_151G	50 (fails pt 2)	59.9	PIC Program	100	76.6

Potential Partners: KPHD, KCD, DOH

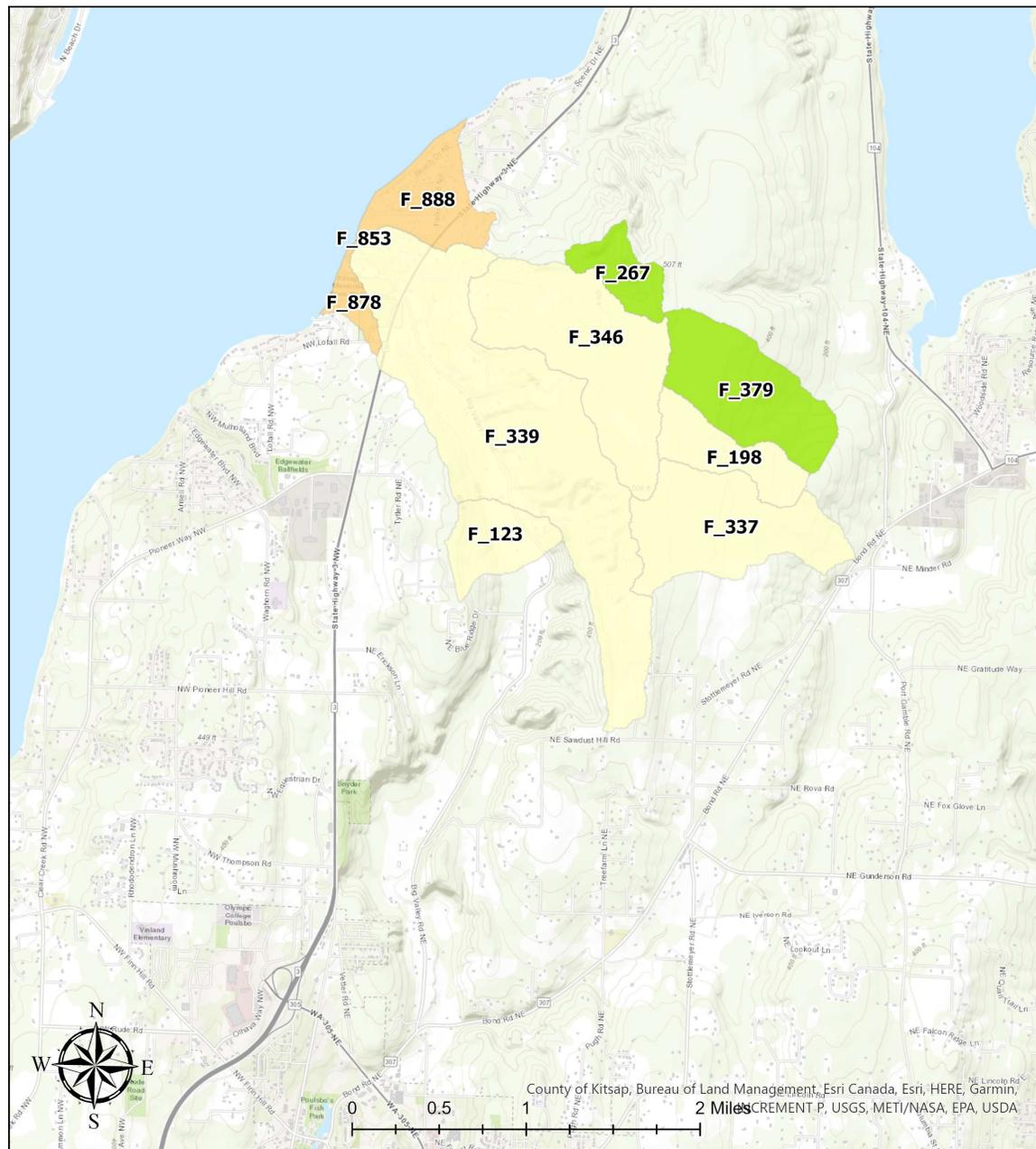
Kinman Creek Streams

- ▶ Scenario 6 - Combination Scenario - Conduct a PIC program and remove full blockage fish passage barriers.
 - ▶ Goal - improve fish passage and water quality for overall watershed health

MU_ID	Current Water Quality Score	Current Fish Passage Score	Current Overall Score	Action	Resulting Water Quality Score	Resulting Fish Passage Score	Overall Score
S_151A	50 (fails pt 2)	30	43.1	PIC Program + remove 1 full barrier	100	50	66.4
S_744	50 (fails pt 2)	100	50.6	PIC Program	100	100	67.3
S_151B	50 (fails pt 2)	1	42.8	PIC Program + remove 3 full barriers	100	50	67.5
S_151D	50 (fails pt 2)	30	48.3	PIC Program + remove 1 full barrier	100	100	78.3
S_151G	50 (fails pt 2)	50	59.9	PIC Program	100	50	76.6

Potential Partners: KPHD, KCD, DOH, Roads, WSDOT

Kinman Creek Forests



Legend

- High
- Low
- Medium
- Very Low

Kinman Creek Watershed

Kinman Creek Forests

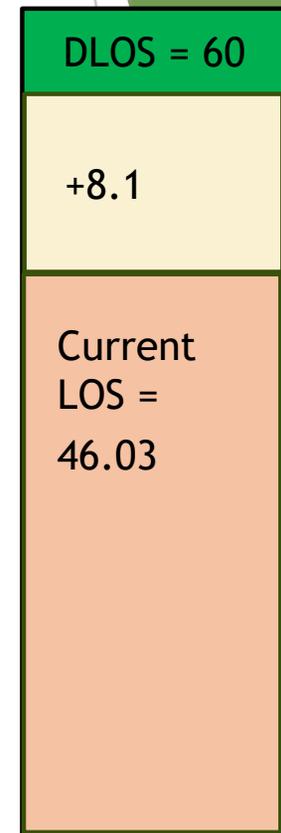
MU_ID	Percent Forest Cover	Percent Mature Forest Cover	Overall Score
F_123	70%	20%	47.8
F_339	73%	13%	46.7
F_346	84%	8.6%	52.7
F_853	12%	0%	3.0
F_878	63%	8.1%	38.1
F_888	48%	1.4%	25.2
*Weighted Overall Score			46.03

*Forest asset LOS and DLOS was set at the weighted average based on the management unit size across a watershed.

Kinman Creek Forests

- ▶ Scenario 7 - Improve forest cover to 85% in all Management Units
 - ▶ Goal - improve overall forest cover to improve groundwater intrusion and cool water reaching the stream

MU_ID	Current Forest Cover Score	Action	Resulting Forest Cover Score
F_123	60.1	Plant/protect 21.6 acres of forest	80.0
F_339	63.6	Plant/protect 133.3 acres of forest	80.0
F_346	79.0	Plant/protect 38.5 acres of forest	80.0
F_853	6.0	Plant/protect 1.1 acres of forest	80.0
F_878	50.2	Plant/ protect 11.1 acres of forest	80.0
F_888	30.1	Plant/protect 68.7 acres of forest	80.0



Total Action Acres	374.2 acres	Weighted Overall Score	54.16
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Potential Partners: Parks, KCD, GPC, DNR

Kinman Creek Forests

- ▶ Scenario 8 - Improve mature forest to 25% in all MUs
 - ▶ Goal - improve hydrologic maturity of the watershed to provide cool water to Kinman creek via groundwater.

MU_ID	Current Mature Forest Cover Score	Action	Resulting Mature Forest Cover Score
F_123	35.5	Acquire/protect 7.9 acres of mature forest	40.0
F_339	29.8	Acquire/protect 133.1 acres of mature forest	40.0
F_346	26.4	Acquire/protect 82 acres of mature forest	40.0
F_853	0	Acquire/protect .4 acres of mature forest	40.0
F_878	25.9	Acquire/protect 8.4 acres of mature forest	40.0
F_888	20.3	Acquire/protect 43.3 acres of mature forest	40.0

DLOS = 60
+5.9
Current LOS = 46.03

Total Action Acres	275.1 acres	Weighted Overall Score	51.88
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Potential Partners: Parks, KCD, GPC, DNR

Kinman Creek Forests

- ▶ Scenario 9 - Combination of 1 and 2 - Focus efforts on F_339 and F_346 to improve forest cover to 85% and mature forest to 25%
 - ▶ Goal - improve hydrologic maturity and overall groundwater intrusion to provide cool water to Kinman Creek

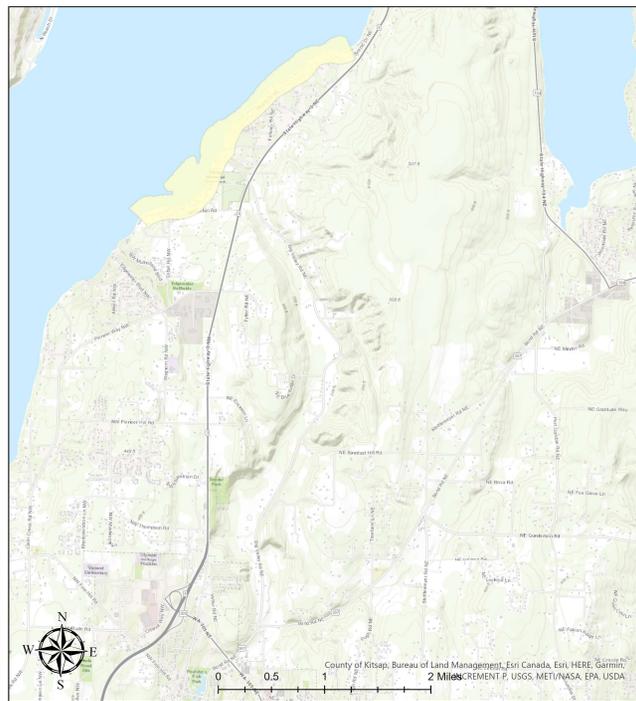
MU_ID	Current Forest Cover Score	Current Mature Forest Cover Score	Action	Resulting Forest Cover Score	Resulting Mature Forest Cover Score
F_339	63.6	29.8	Plant/protect 133.3 acres of forest and Acquire/protect 133.1 acres of mature forest	80.0	40.0
F_346	79.0	26.4	Plant/protect 38.5 acres of forest and Acquire/protect 82 acres of mature forest	80.0	40.0

DLOS = 60
+9.2
Current LOS = 46.03

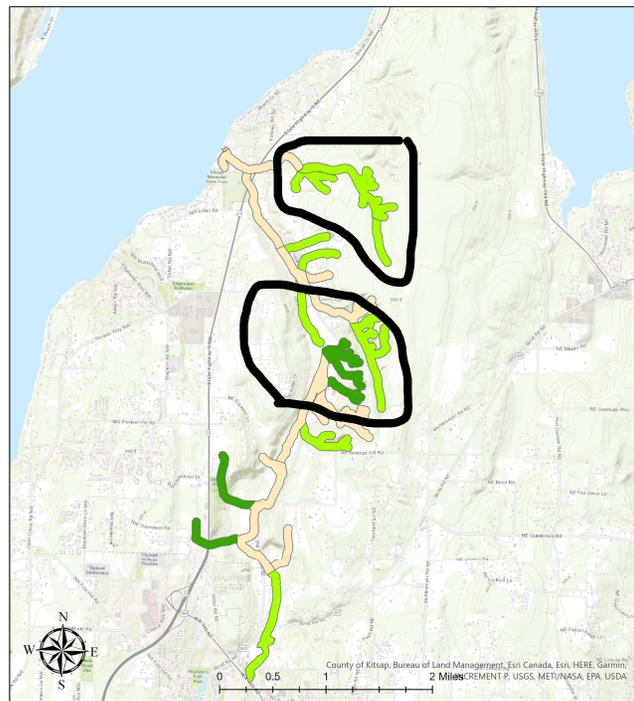
Total Action Acres	215.3 acres	Weighted Overall Score	55.25
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Potential Partners: Parks, KCD, GPC, DNR

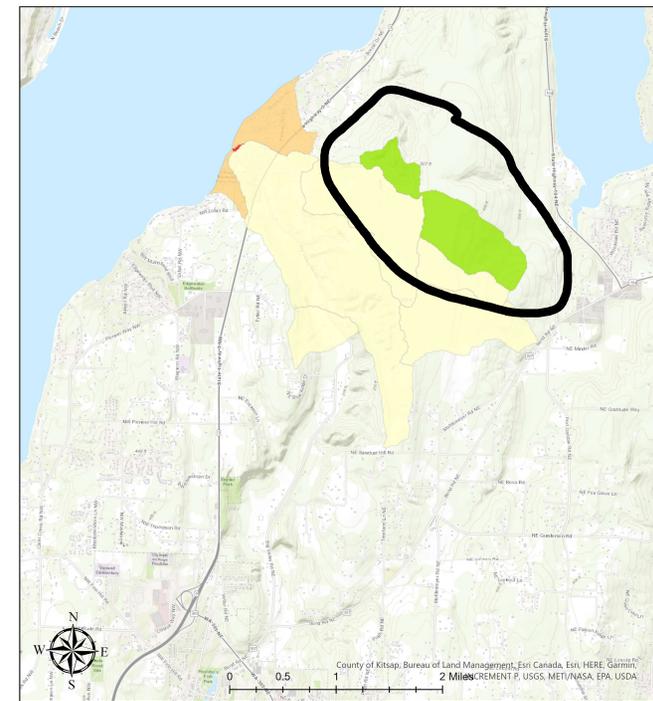
Kinman Creek Watershed Areas to Protect



Kinman Creek Watershed



Kinman Creek Watershed



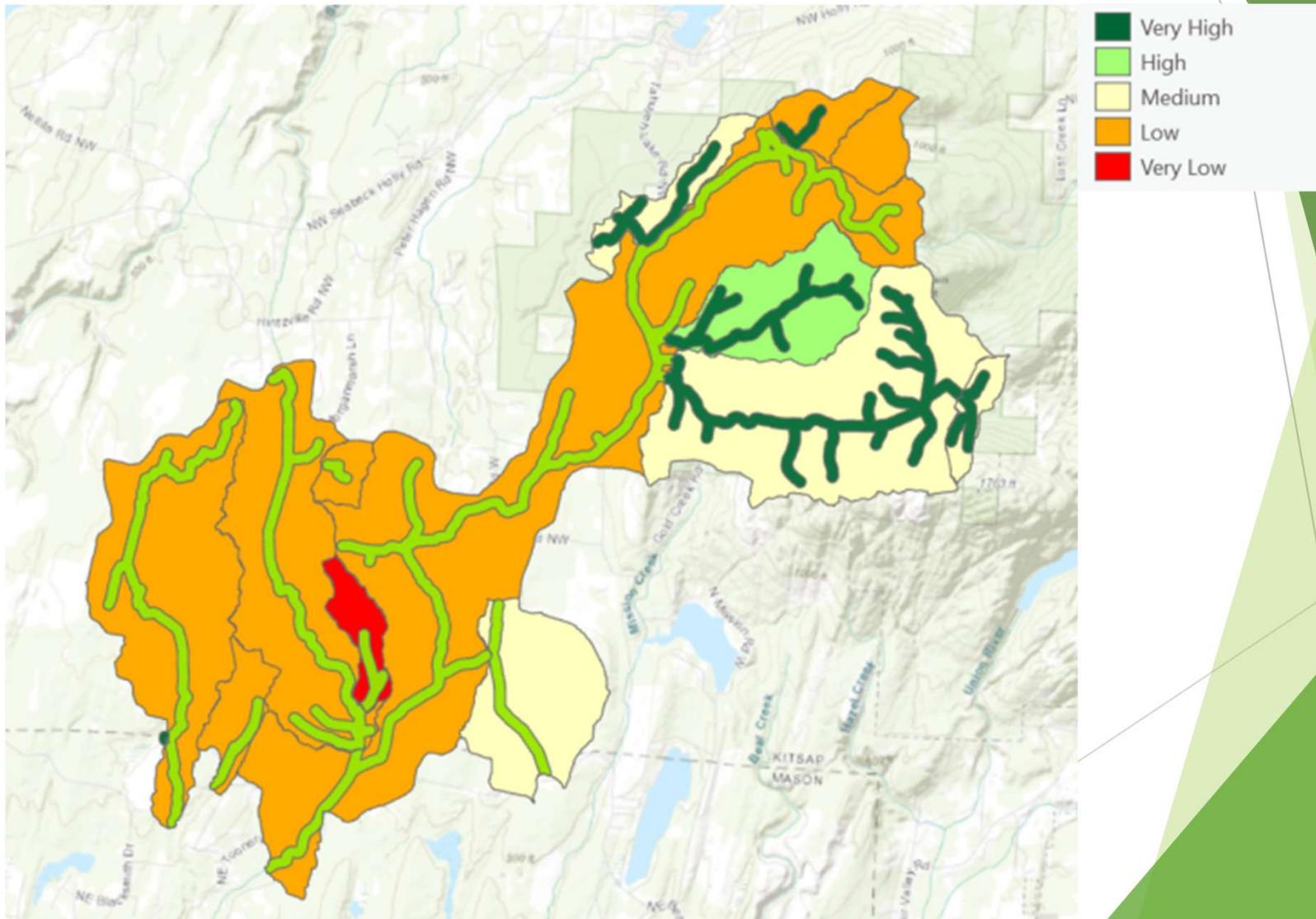
Kinman Creek Watershed

Scenario Review - Kinman Creek

Scenario	Asset	Action	LOS Improvement
1	Shoreline	Decrease armoring by removing 3,200ft	+ 6
2	Shoreline	Improve shoreline vegetation by planting 2,100ft	+ 6.6
3	Shoreline	Decrease armoring by removing 1,800ft and improve shoreline vegetation by planting 1,100ft	+ 6.8
4	Stream	Remove 11 full blockage fish passage barriers across six MUs	+ 12.2
5	Stream	Conduct a PIC program to improve water quality	+ 14
6	Stream	Remove 5 full blockage fish passage barriers and conduct a PIC program to improve water quality	+22.3
7	Forest	Improve forest cover by planting/protecting 374 acres	+ 8.1
8	Forest	Improve mature forest cover by acquiring/protecting 275 acres	+ 5.9
9	Forest	Improve forest cover by planting/protecting 172 acres and mature forest cover by acquiring/protecting 215 acres	+ 9.2

Skokomish Tribe Areas of Interest

Tahuya River Headwaters



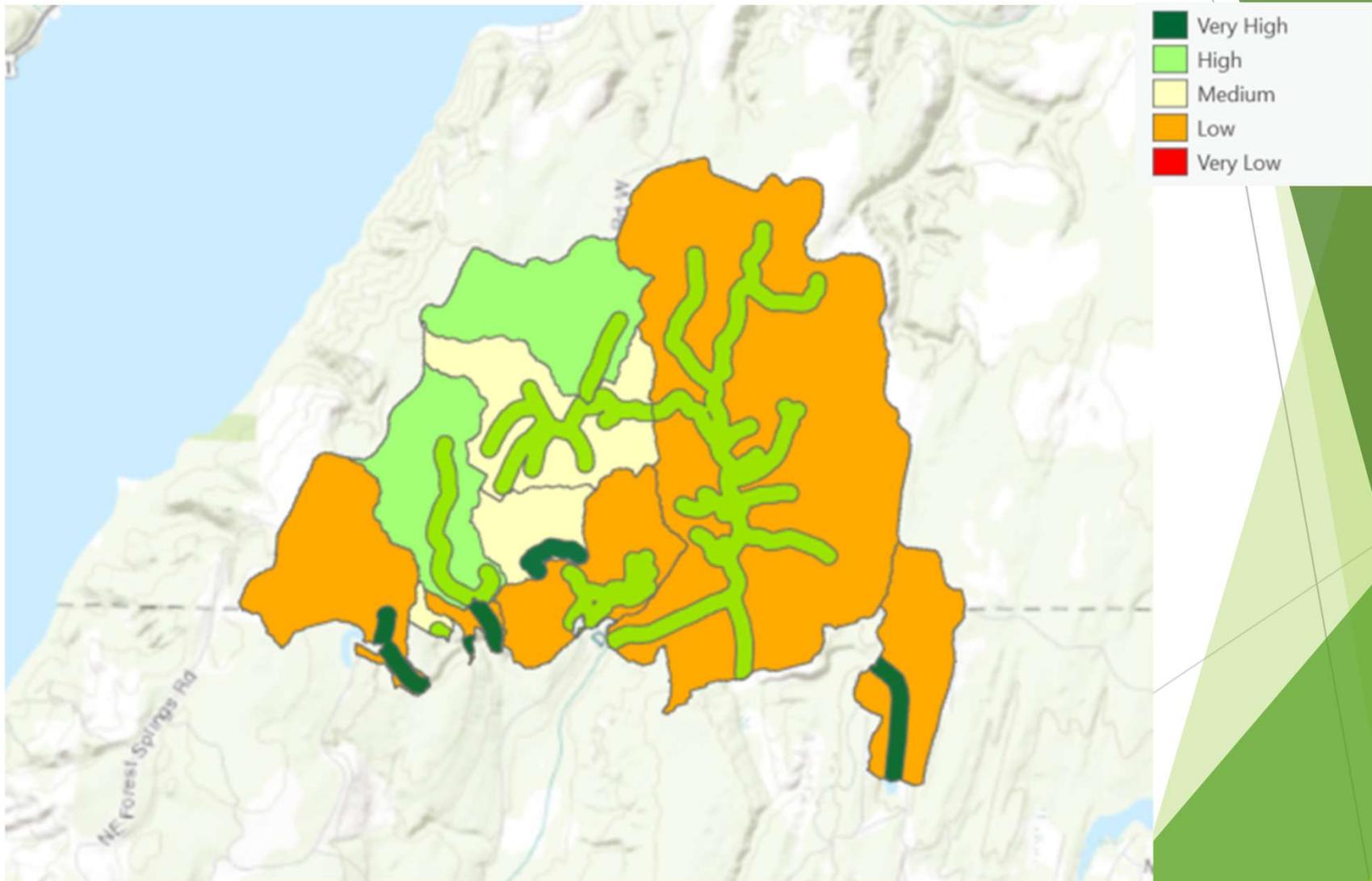
Skokomish Tribe Areas of Interest

Tahuya River Headwaters

- ▶ Streams
 - ▶ All 13 stream management units are currently at or above the DLOS of High
- ▶ Forests
 - ▶ 12 of 13 forest management units are below the DLOS of High
 - ▶ Weighted average for Tahuya River headwaters - 39.33 (Low)
- ▶ Shorelines
 - ▶ There are no shorelines management units connected to the Tahuya River headwater units in Kitsap County

Skokomish Tribe Areas of Interest

Dewatto River Headwaters



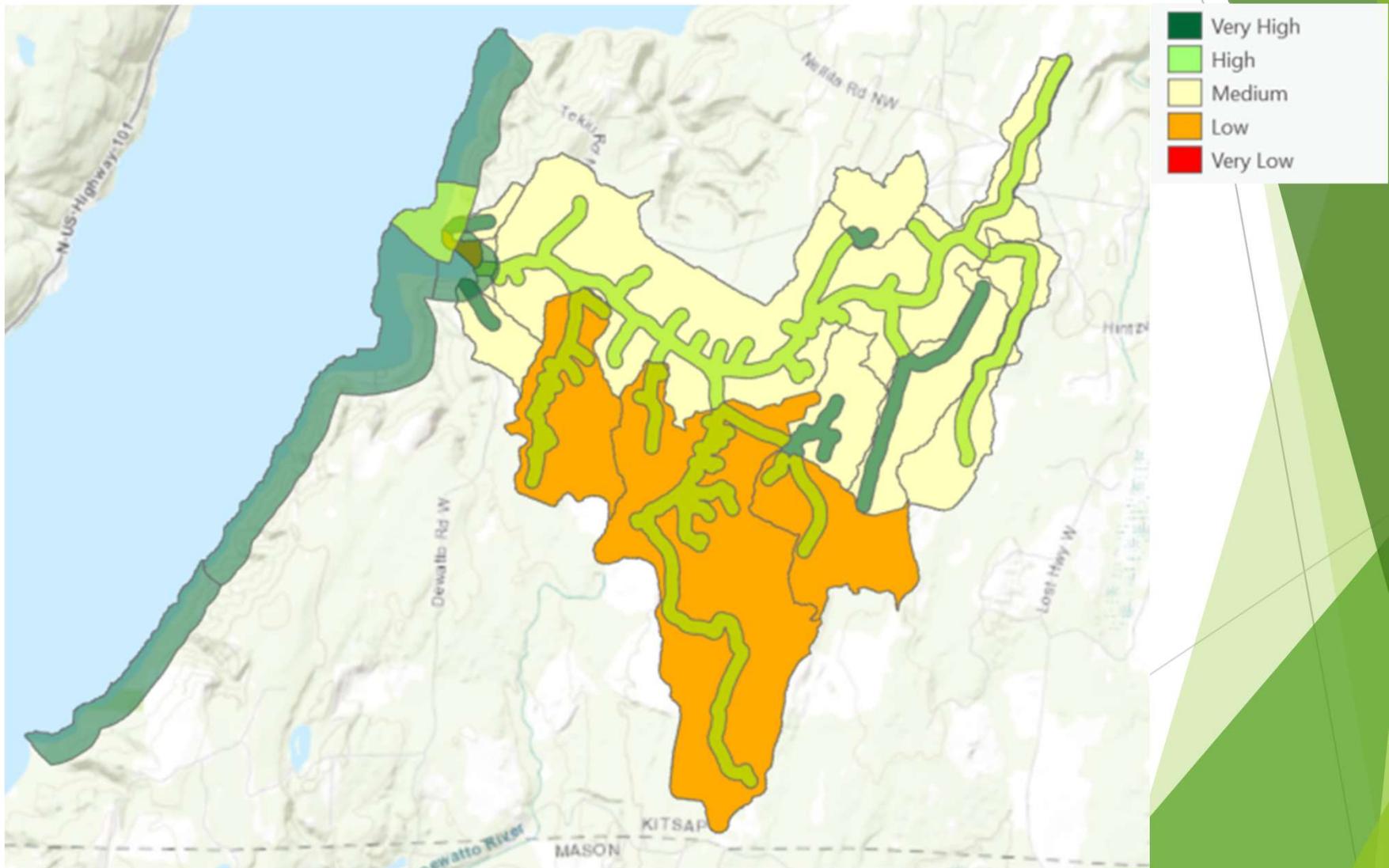
Skokomish Tribe Areas of Interest

Dewatto River Headwaters

- ▶ Streams
 - ▶ All 9 stream management units are currently at or above the DLOS of High
- ▶ Forests
 - ▶ 7 of 9 forest management units are below the DLOS of High
 - ▶ Weighted average for Dewatto River headwaters = 34.31 (Low)
- ▶ Shorelines
 - ▶ There are no shoreline management units connected to the Dewatto River headwaters in Kitsap County

Skokomish Tribe Areas of Interest

Anderson Creek



Skokomish Tribe Areas of Interest

Anderson Creek

- ▶ Streams
 - ▶ All 11 stream management units are currently at or above the DLOS of High.
- ▶ Forests
 - ▶ All 12 forest management units in the Anderson Creek watershed are below the DLOS of High
 - ▶ Weighted average for Anderson Creek = 43.27 (Medium)
- ▶ Shorelines
 - ▶ All 5 shoreline management units near Anderson Creek and south near Dewatto River are at or above the DLOS of High.