Appendix A

Table S1. Oregon sub-basins included in the study, identified by USGS 8th field hydrologic unit code (HUC8) and sub-basin name.

HUC8 #	Name	HUC8#	Name
16040201	Upper Quinn	17070307	Trout
17050116	Upper Malheur	17080001	Lower Columbia-Sandy
17050201	Brownlee Reservoir	17090001	Middle Fork Willamette
17050202	Burnt	17090003	Upper Willamette
17050203	Powder	17090004	Mckenzie
17060101	Hells Canyon	17090005	North Santiam
17060102	Imnaha	17090006	South Santiam
17060103	Lower Snake-Asotin	17090011	Clackamas
17060104	Upper Grande Ronde	17100301	North Umpqua
17060105	Wallowa	17100302	South Umpqua
17060106	Lower Grande Ronde	17100307	Upper Rogue
17070101	Middle Columbia-Lake Wallula	17100309	Applegate
17070102	Walla Walla	17100310	Lower Rogue
17070103	Umatilla	17100311	Illinois
17070105	Middle Columbia-Hood	17120002	Silvies
17070201	Upper John Day	17120005	Summer Lake
17070202	North Fork John Day	17120006	Lake Abert
17070203	Middle Fork John Day	17120007	Warner Lakes
17070204	Lower John Day	18010201	Williamson
17070301	Upper Deschutes	18010202	Sprague
17070302	Little Deschutes	18010203	Upper Klamath Lake
17070304	Upper Crooked	18010206	Upper Klamath
17070305	Lower Crooked	18020001	Goose Lake
17070306	Lower Deschutes		

Appendix B

Table S2. Bull Trout and Brook Trout presence, by HUC8 and sub-basin name. X indicates species presence based on ODFW fish habitat database.

HUC8 #	HUC Name	Bull Trout	Brook Trout
16040201	Upper Quinn		X
17050116	Upper Malheur	X	X
17050201	Brownlee Reservoir	X	X
17050202	Burnt		X
17050203	Powder	X	X
17060101	Hells Canyon	X	
17060102	Imnaha	X	
17060103	Lower Snake-Asotin	X	
17060104	Upper Grande Ronde	X	X
17060105	Wallowa	X	X
17060106	Lower Grande Ronde	X	
17070101	Middle Columbia-Lake Wallula	X	
17070102	Walla Walla	X	
17070103	Umatilla	X	
17070105	Middle Columbia-Hood	X	X
17070201	Upper John Day	X	X
17070202	North Fork John Day	X	X
17070203	Middle Fork John Day	X	X
17070204	Lower John Day	X	
17070301	Upper Deschutes	X	X
17070302	Little Deschutes	X	X
17070304	Upper Crooked	X	X
17070305	Lower Crooked	X	
17070306	Lower Deschutes	X	X
17070307	Trout	X	
17080001	Lower Columbia-Sandy	X	X
17090001	Middle Fork Willamette	X	X
17090003	Upper Willamette	X	
17090004	Mckenzie	X	X
17090005	North Santiam	X	X
17090006	South Santiam	X	X
17090011	Clackamas	X	X
17100301	North Umpqua		X
17100302	South Umpqua		X
17100307	Upper Rogue		X

HUC8 #	HUC Name	Bull Trout	Brook Trout
17100309	Applegate		X
17100310	Lower Rogue		X
17100311	Illinois		X
17120002	Silvies		X
17120005	Summer Lake		X
17120006	Lake Abert		X
17120007	Warner Lakes		X
18010201	Williamson		X
18010202	Sprague	X	X
18010203	Upper Klamath Lake	X	X
18010206	Upper Klamath		X
18020001	Goose Lake		X

Appendix C

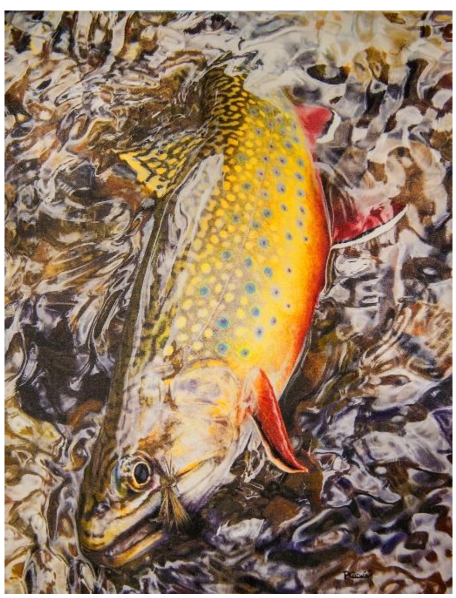
Researcher Survey 1

Hello,
My name is Michael Manning, I'm a graduate student at Oregon State University in the Fisheries Science program. My project is focused on modeling the risk of hybridization between native and introduced salmonids based on landscape variables. My approach is an adaptation of Intrinsic Potential Model described by Burnett et al. (2007), where I will be looking at the spawning habitat preferences of *Salvelinus confluentus* (native to the region) and *S. fontinalis* (introduced). To better define the variables that will be included in the model, I am conducting a survey of researchers who have published work related to *S. fontinalis*.

The survey has four questions and should take no more than five minutes to complete. The questions cover stream temperature, gradient, discharge, and valley width index (VWI). Valley width index is the ratio between the valley floor and the active channel width and will be used to describe valley confinement in relation to the stream reach being modelled.

This is the first part of a two-part survey. Based on survey responses a series of graphs will be produced, those graphs will be shared with you later this summer to obtain your opinion on inflection points and other observed trends in *S. fontinalis* spawning preferences.

Everyone who completes these surveys will be entered in a drawing to receive a printed copy of the Brook Trout print drawn by Pamela Corwin, a wildlife and fisheries biologist with the South Carolina Department of Natural Resources, that was featured on cover of the Jan/Feb 2020 issue of S.C. Wildlife.



Thank you for your time, and if you have any questions or concerns please don't hesitate to contact me.

Michael A. Manning
Department of Fisheries and Wildlife
Oregon State University

Brook Trout Habitat Preference Survey 1

Instructions: Thank you for completing the Brook Trout spawning habitat survey.

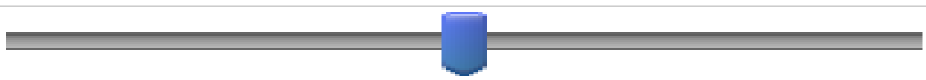
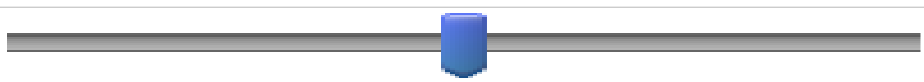
We are developing a GIS model to assess the risk of hybridization between native Bull Trout (*Salvelinus confluentus*) and introduced Brook Trout (*S. fontinalis*) in Oregon. Part of our predictive model includes an adaptation of the Intrinsic Potential Model (Burnett et. al, 2007) that uses landscape characteristics (i.e., topography) to model stream reaches most suitable as spawning habitat. To better define in our model the range of habitat conditions used by spawning *S. fontinalis* we are surveying experts that have published work related to habitat use by this species. Based on your experience, please indicate spawning *S. fontinalis* habitat preferences for the parameters listed below.

This is the first part of a two-part survey. Based on survey responses a series of graphs will be produced, those graphs will be shared with you later this summer to obtain your opinion on inflection points and other observed trends in *S. fontinalis* spawning preferences.

The link to this survey will expire at 11:59 pm (PDT UTC -7:00, Pacific Time) on Sunday, September 6th.

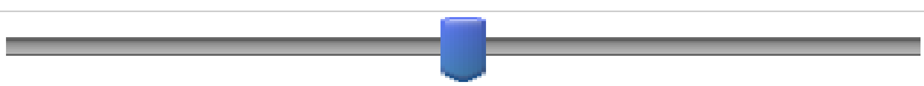
Q1 Temperature affects all aspects of aquatic life. Using the sliders below, please select what you believe are the critical upper and lower stream temperature (Celsius) limits for S. *fontinalis* spawning. If you are unsure or don't believe that stream temperature is important, leave both sliders set at zero.

O^{C}

	0 3 5 8 10 13 15 18 20 23 25
Lower Limit	
Upper Limit	

Q2 Stream Gradient. Using the slider below, please select what you believe is the maximum stream gradient where you would expect to find spawning *S. fontinalis*.

Stream Gradient (%)

	1 3 5 7 9 11 13 15
	

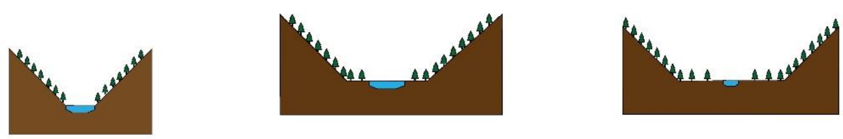
Q3 Stream Discharge. Please use the sliders below to select what you consider the minimum and maximum mean monthly stream discharge rates preferred by spawning *S. fontinalis*.

Mean Monthly Discharge (m^3/s)

	0	3	5	8	10	13	15	18	20	23	25
Minimum Monthly Discharge											
Maximum Monthly Discharge											

Q4 Valley Constraint. Measured as Valley Width Index, the ratio of valley floor width to channel width. A VWI of 5.0 or less is considered constrained, while a VWI of 10.0 or greater is considered unconstrained. Please use the sliders below to identify the range of valley constraint preferred by spawning *S. fontinalis.*

Constrained Valley Moderate Valley Constraint Unconstrained Valley



	0	5	10	15
Minimum VWI				
Maximu m VWI				

If you believe that other habitat characteristics critical for spawning *S. fontinalis* have been overlooked, the ranges for the parameters above are incorrect, or have any other comments, please provide them in the space below.

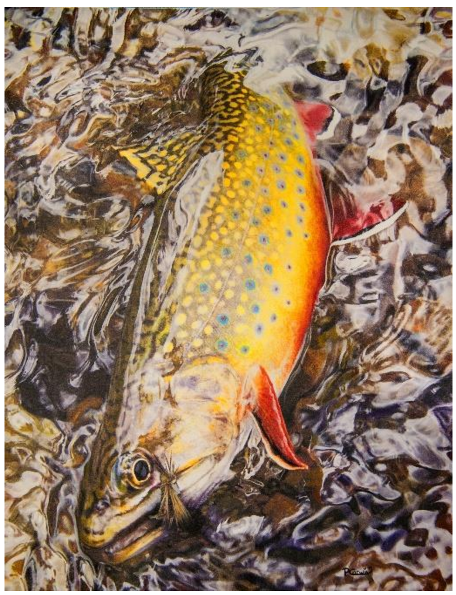
Researcher Survey 2

Hello,
My name is Michael Manning, I'm a graduate student at Oregon State University in the Fisheries Science program. Late in the summer of 2020 you were contacted and asked to participate in survey I was conducting about Brook Trout (*Salvelinus fontinalis*) **spawning habitat** preferences. This is the second part of the Brook Trout Spawning Habitat Survey.

The survey has four questions and should take no more than ten minutes to complete. The responses to the first survey were used to develop Suitability Index (SI) curves for **Brook Trout spawning habitat**. The SI curves included in this survey are based on response means from the earlier survey. The purpose of this survey is to better define those curves before they are incorporated into the hybridization risk model.

Each of the SI curves include inflection points representing absolute minimum & maximum thresholds, as well as optimal minimum and maximum values. You are asked to use the sliders corresponding to each point to select the appropriate values for the related landscape characteristic.

Everyone who completes these surveys will be entered in a drawing to receive a printed copy of the Brook Trout print drawn by Pamela Corwin, a wildlife and fisheries biologist with the South Carolina Department of Natural Resources, that was featured on cover of the Jan/Feb 2020 issue of S.C. Wildlife. The survey links are created for each of you individually, please do not forward your survey. If there is someone that you think should be included, please email me their information and a link will be created for them.



Thank you for your time, and if you have any questions or concerns please don't hesitate to contact me.

Michael A. Manning
Department of Fisheries and Wildlife
Oregon State University

Brook Trout Habitat Preference Survey 2

Instructions: Thank you for completing the Brook Trout Spawning Habitat Survey 2.0.

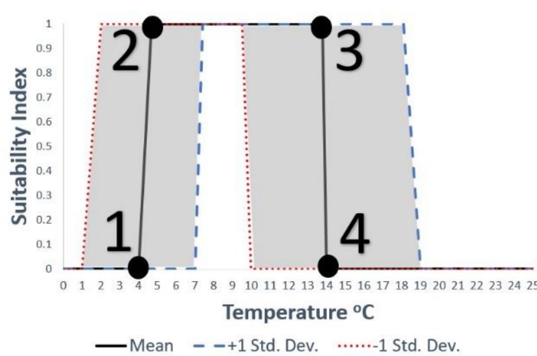
We are developing a model to quantify the risk of hybridization between native Bull Trout (*Salvelinus confluentus*) and introduced Brook Trout (*S. fontinalis*) in Oregon, based on specific landscape variables. Our approach includes an adaptation of the Intrinsic Potential Model (Burnett et. al, 2007) that uses landscape characteristics (i.e., topography) to model stream reaches most suitable as **Brook Trout spawning habitat**.

This is the follow-up to the Brook Trout Spawning Habitat Survey completed in the Fall of 2020. The results of the Fall survey were used to develop Suitability Index (SI) curves based on the minimum and maximum values from your responses. The proposed SI curves are presented below. This second survey requires that the SI curves be refined to include optimum ranges, as well as the tails of the distributions. Please use the slider that corresponds to the inflection points in each diagram to identify the appropriate thresholds for each curve.

To start the survey, please click the arrow below.

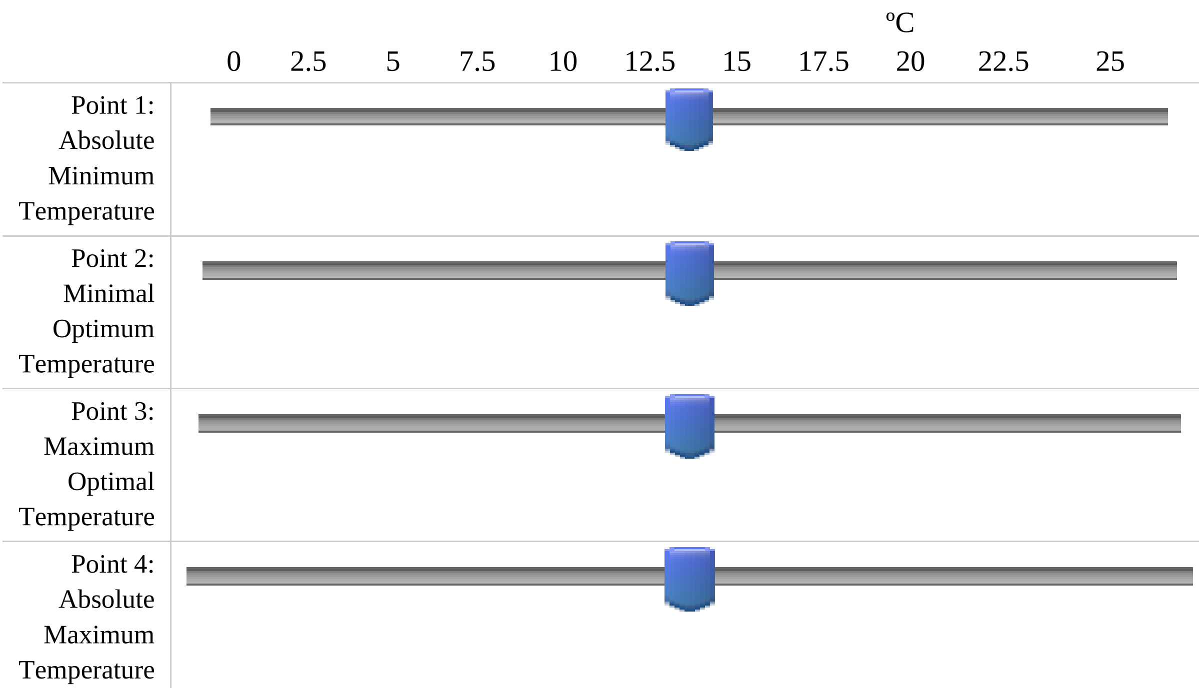
Q1 – Stream Temperature: In the first survey, respondents were asked to select critical upper and lower stream temperature (Celsius) limits for **Brook Trout spawning conditions**. The responses for the Lower Limit ranged from 0.0ºC to 10.3ºC, with a mean of 4.7ºC, a median of 4.6ºC, and a standard deviation of 2.7ºC. The responses for the Upper Limit ranged from 7.2ºC to 22.0ºC, with a mean of 13.8ºC, a median of 12.6ºC, and a standard deviation of 4.3ºC.

In the diagram below, Point 1 represents the absolute minimum stream temperature for **Brook Trout spawning**. Point 2 represents the minimum limit of the optimum range in stream temperatures. Point 3 represents the maximum limit of the optimum range in stream temperatures, and Point 4 represents the absolute maximum stream temperature for **Brook Trout spawning**.



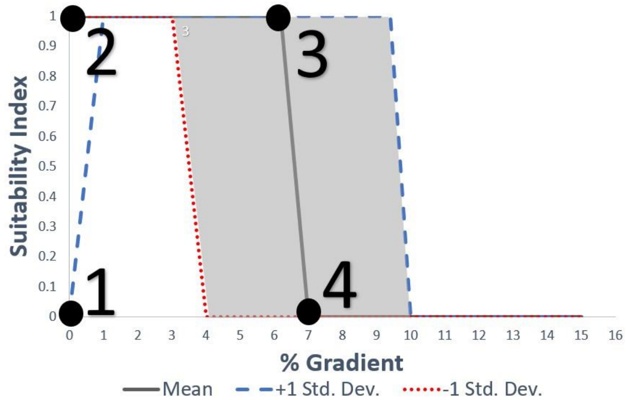
Using the sliders below, please select the appropriate temperature for each of the points above.

Point 1: Please select the absolute minimum stream temperature required for **Brook Trout spawning**.
Point 2: Please select the minimum optimal stream temperature for **Brook Trout spawning**.
Point 3: Please select the maximum optimal stream temperature for **Brook Trout spawning**.
Point 4: Please select the absolute maximum stream temperature for **Brook Trout spawning**.



Q2 – Gradient: In the first survey, respondents were asked to select the Maximum Gradient suitable for **Brook Trout spawning**. The responses for the Maximum Gradient ranged from 1.0% to 15.0%, with a mean of 6.2%, a median of 5.3%, and a standard deviation of 3.2.

In the diagram below, Point 1 represents the absolute minimum stream gradient for **Brook Trout spawning**. Point 2 represents the optimal minimum stream gradient. Point 3 represents the optimal maximum stream gradient and Point 4 represents the maximum stream gradient for **Brook Trout spawning**.



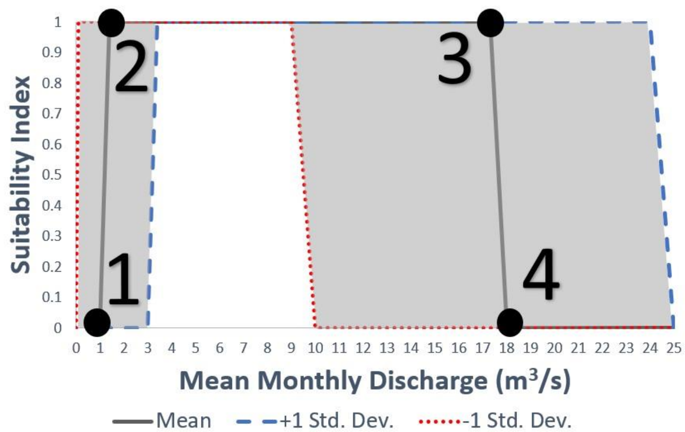
Using the sliders below, please select the appropriate gradient for each of the points above.

Point 1: Please select the absolute minimum stream gradient for **Brook Trout spawning**.
Point 2: Please select the minimum optimal stream gradient for **Brook Trout spawning**.
Point 3: Please select the maximum optimal stream gradient for **Brook Trout spawning**.
Point 4: Please select the absolute maximum stream gradient for **Brook Trout spawning**.

	Stream Gradient (%) 0 3 6 9 12 15
Point 1: Absolute Minimum Gradient	
Point 2: Minimum Optimal Gradient	
Point 3: Maximum Optimal Gradient	
Point 4: Absolute Maximum Gradient	

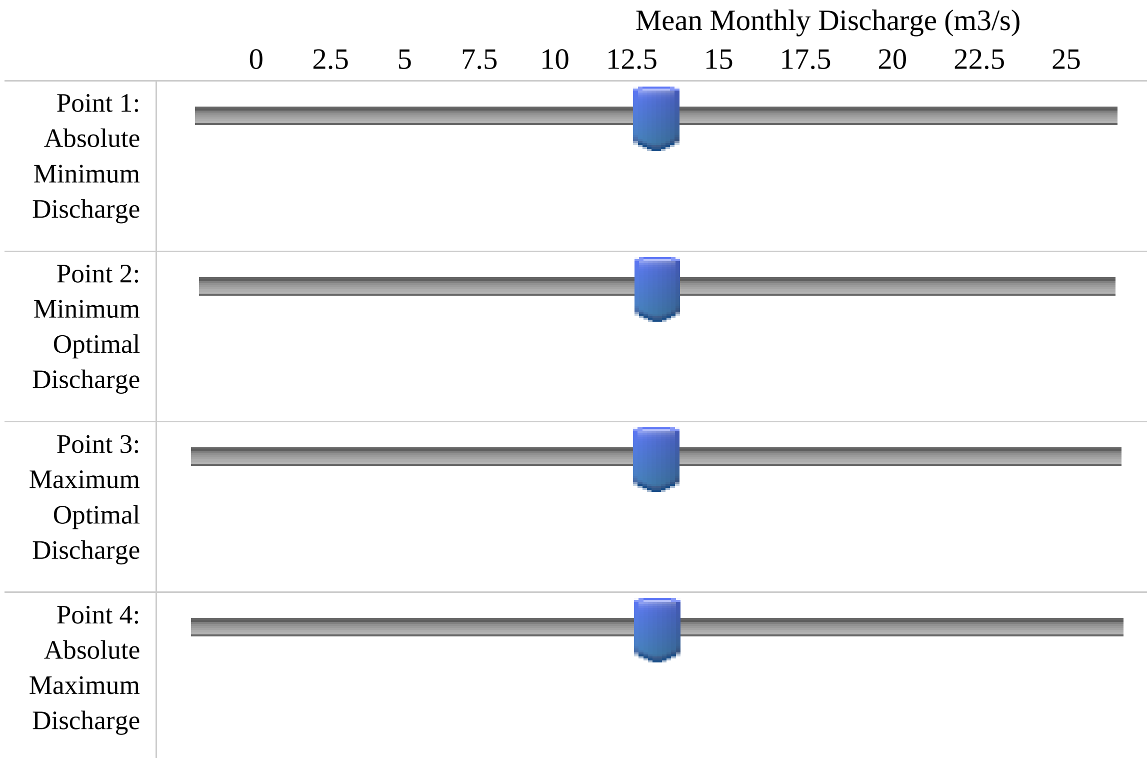
Q3 – Discharge: Respondents to the first survey were asked to identify the minimum and maximum monthly discharge rates during **Brook Trout spawning**. Responses for Minimum Discharge ranged from 0.1 to 7.3 m^3/s, with a mean of 1.4 m^3/s, a median of 0.3 m^3/s, and a standard deviation of 2.0 m^3/s. Responses for Maximum Discharge ranged from 7.1 to 25.0 m^3/s, with a mean of 17.3 m^3/s, a median of 15.4 m^3/s, and a standard deviation of 7.8 m^3/s.

In the diagram below, Point 1 represents the absolute minimum discharge for Brook Trout spawning. Point 2 represents the optimal minimum discharge. Point 3 represents the optimal maximum discharge and Point 4 represents the absolute maximum discharge for **Brook Trout spawning.**



Using the sliders below, please select the appropriate discharge for each of the points above.

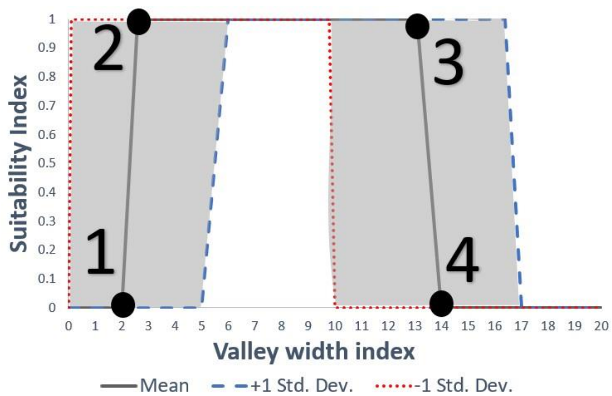
Point 1: Please select the absolute minimum stream discharge for **Brook Trout spawning.**
Point 2: Please select the minimum optimal stream discharge for **Brook Trout spawning.**
Point 3: Please select the maximum optimal stream discharge for **Brook Trout spawning.**
Point 4: Please select the absolute maximum stream discharge for **Brook Trout spawning.**


Mean Monthly Discharge (m3/s)
0
2.5
5
7.5
10
12.5
15
17.5
20
22.5
25
Point 1: Absolute Minimum Discharge
Point 2: Minimum Optimal Discharge
Point 3: Maximum Optimal Discharge
Point 4: Absolute Maximum Discharge

Q4 – Valley Constraint: Measured as Valley Width Index, the ratio of valley floor width to channel width. A VWI of 5.0 or less is considered constrained, while a VWI of 10.0 or greater is considered unconstrained.

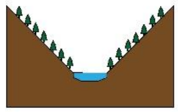
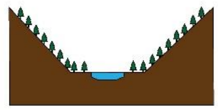
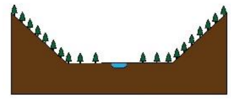
The responses from the first survey for the Minimum Valley Width Index (VWI) ranged from 0.0 to 14.0, with a mean of 2.6, a median of 1.0, and a standard deviation of 3.4. The responses for the Maximum VWI ranged from 4.0 to 15.0, with a mean of 13.1, a median of 15.0, and a standard deviation of 3.03.

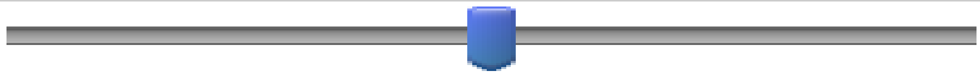
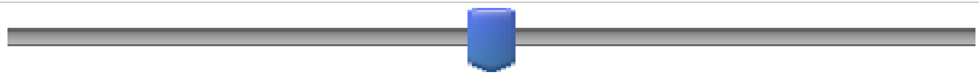
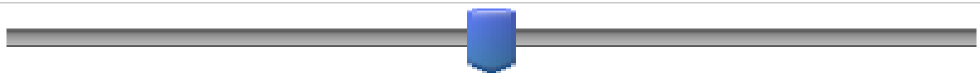
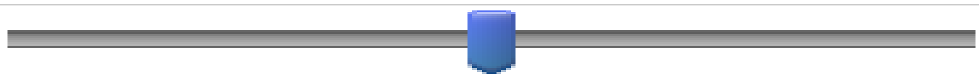
In the diagram below, Point 1 represents the minimum VWI for **Brook Trout spawning**. Point 2 represents the optimal minimum VWI. Point 3 represents the optimal maximum VWI, and Point 4 represents the maximum VWI for **Brook Trout spawning**.



Using the sliders below, please select the appropriate VWI for each of the points above.

Point 1: Please select the absolute minimum VWI for **Brook Trout spawning**.
Point 2: Please select the minimum optimal VWI for **Brook Trout spawning**.
Point 3: Please select the maximum optimal VWI for **Brook Trout spawning**.
Point 4: Please select the absolute maximum VWI for **Brook Trout spawning**.

			
	Constrained Valley	Moderate Valley Constraint	Unconstrained Valley

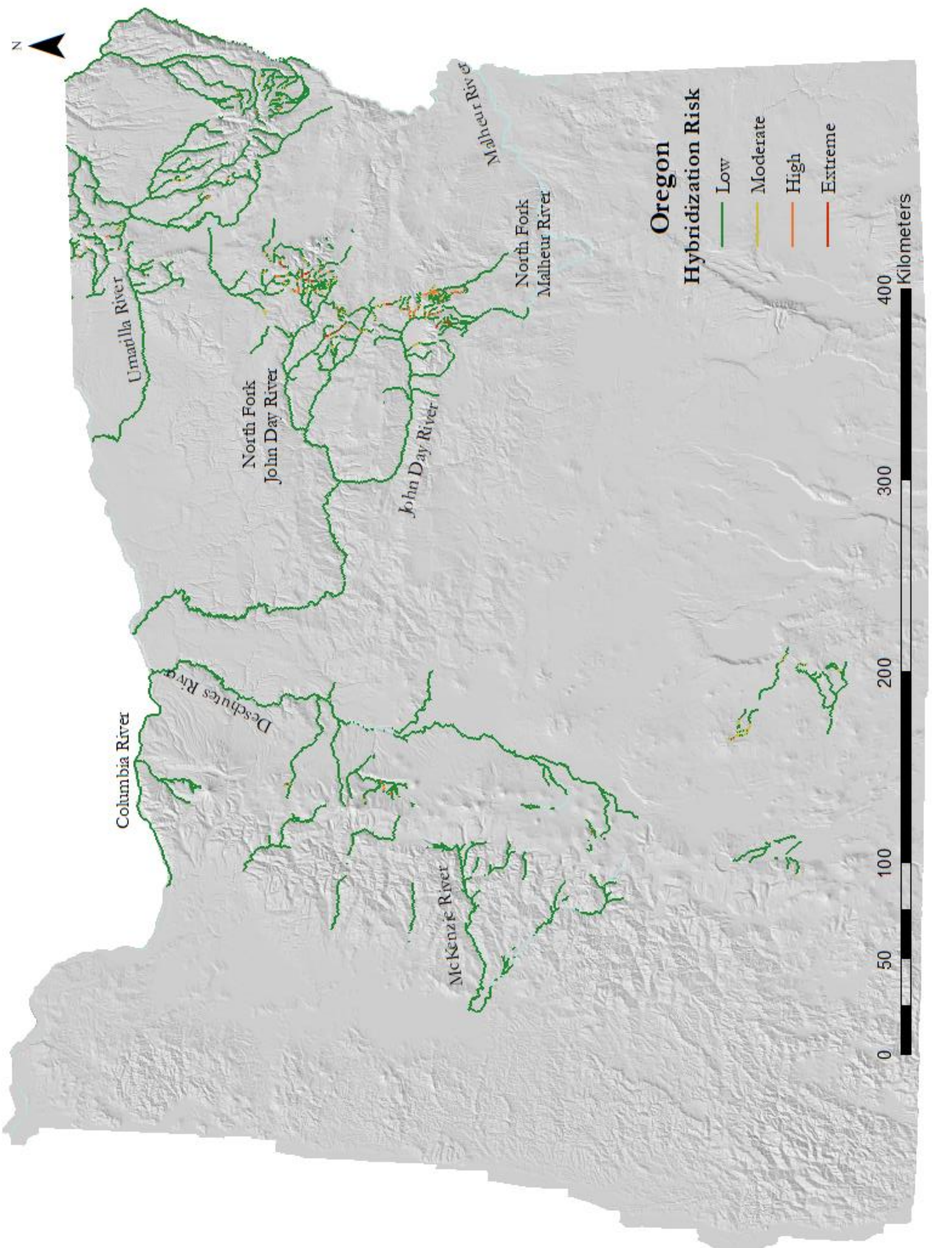
	0 5 10 15
Point 1: Absolute Minimum VWI	
Point 2: Minimum Optimal VWI	
Point 3: Maximum Optimal VWI	
Point 4: Absolute Maximum VWI	

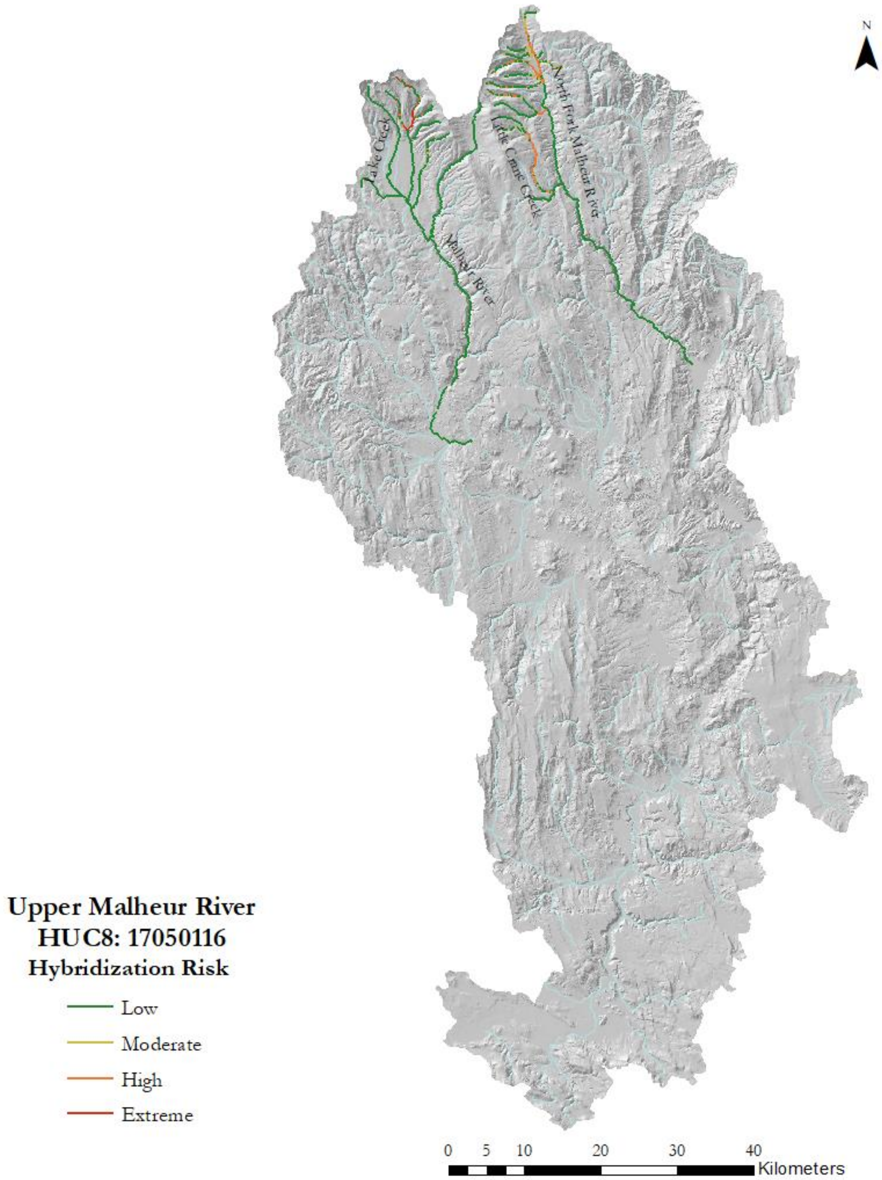
If you have any other comments, please provide them in the space below.

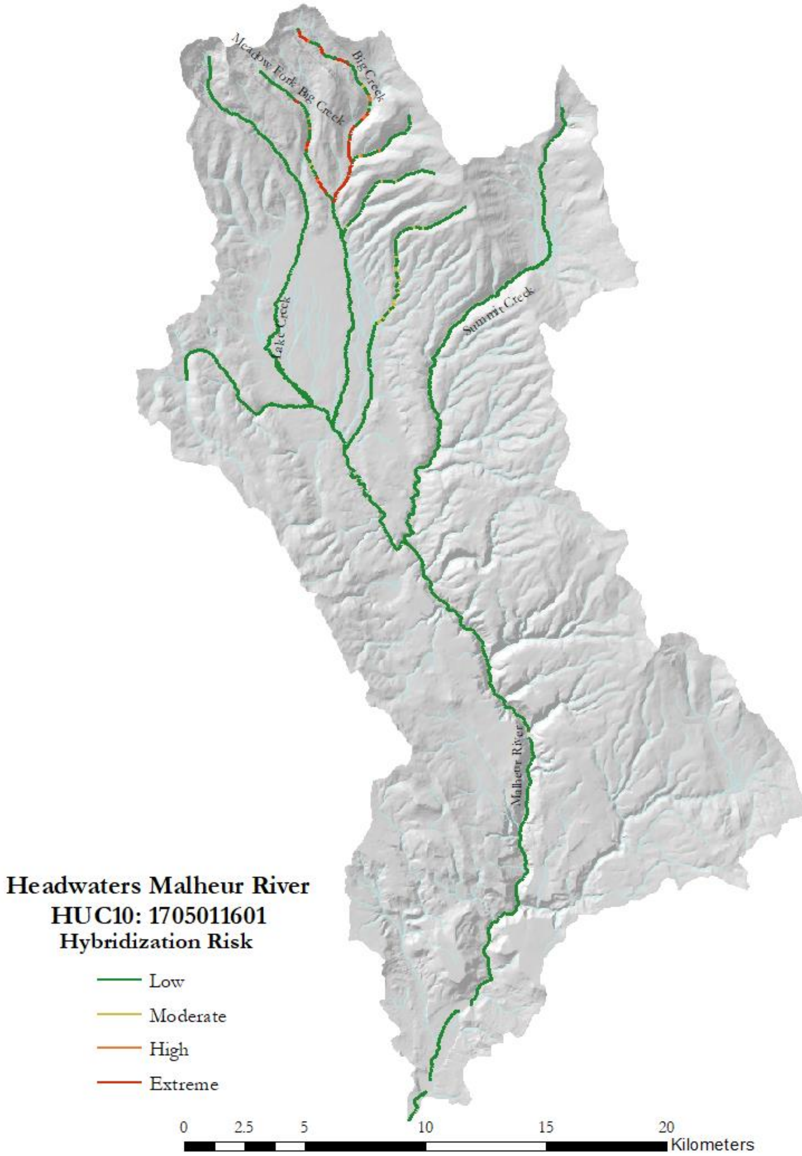
Appendix D

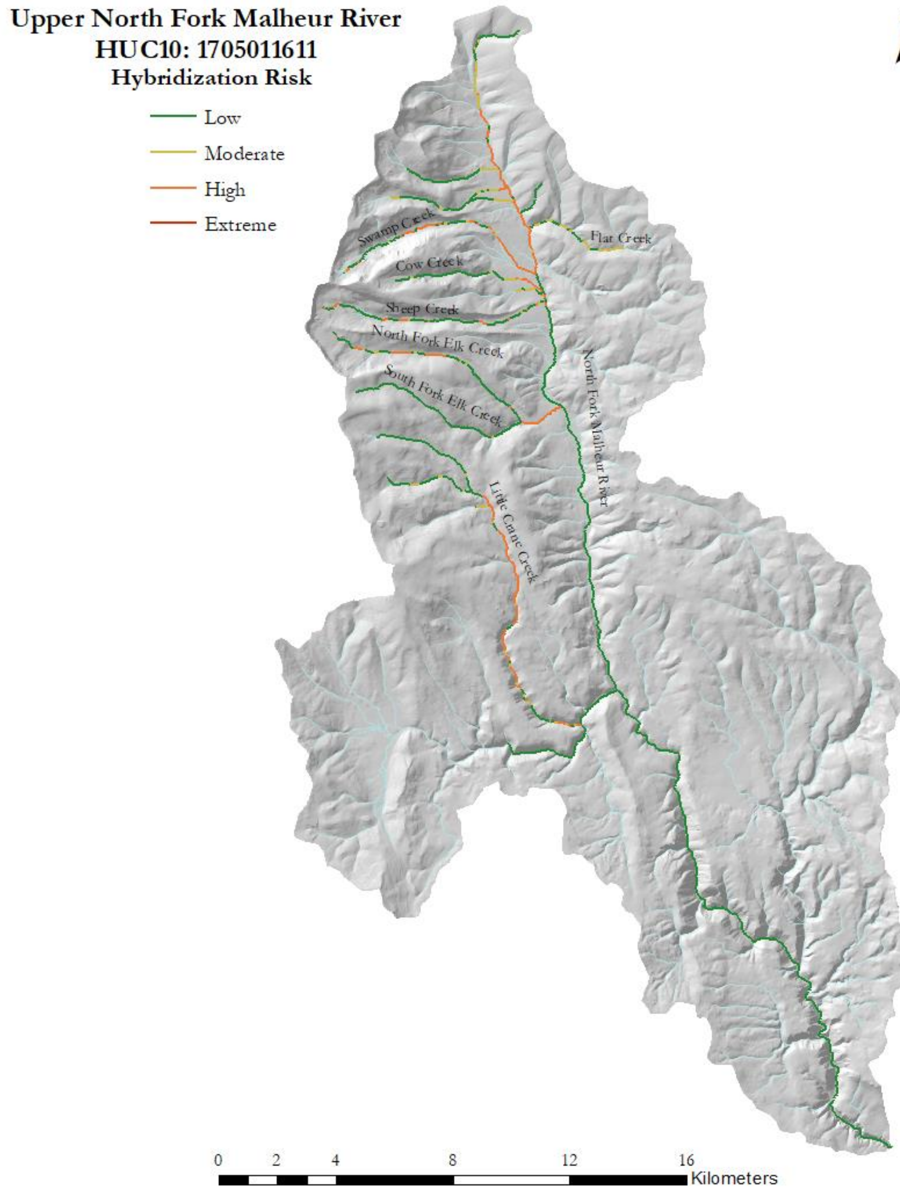
Risk Maps

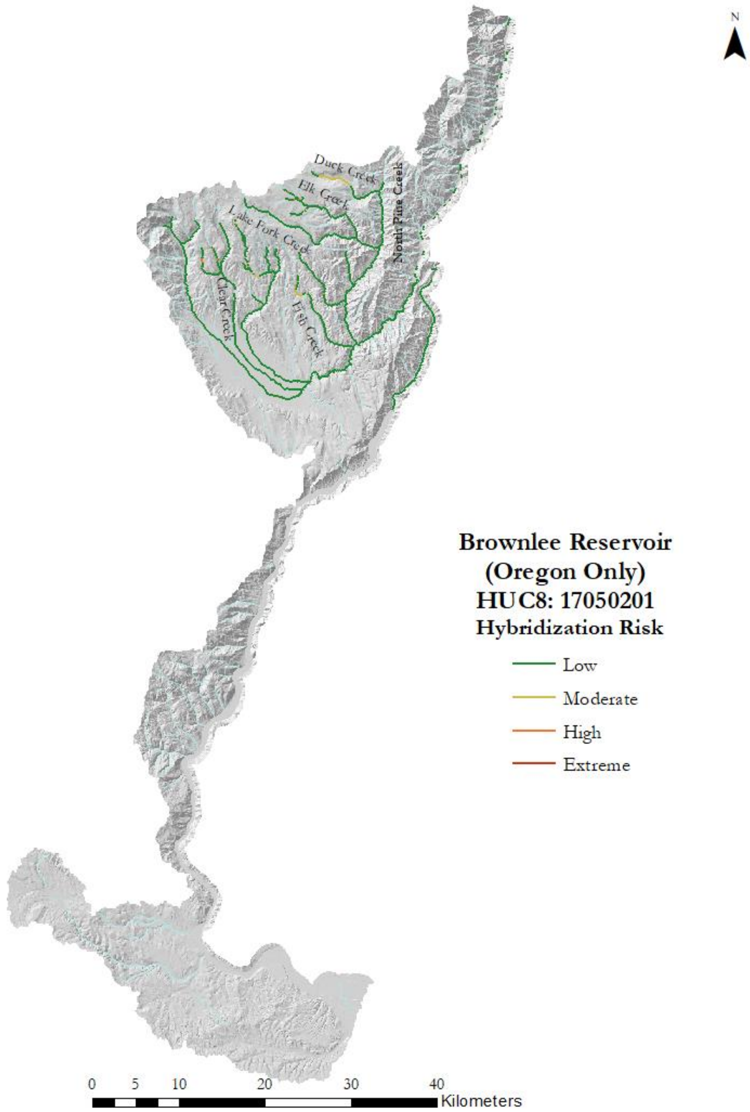
Example maps illustrating hybridization risk at the state level and for each HUC8 sub-basin in the study area based on Tables S1 and S2. Additional maps at the watershed (HUC10) scale are included to show greater detail of reaches with Moderate to Extreme risk within their respective sub-basins.

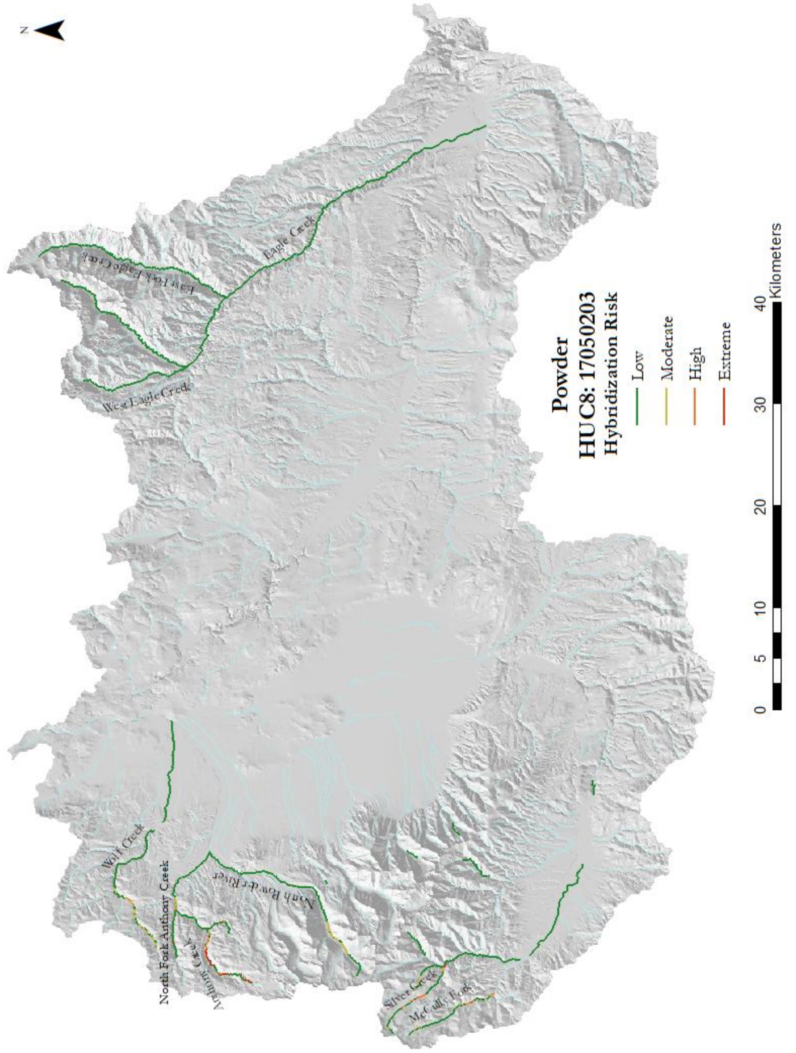

Oregon
Hybridization Risk
Low
Moderate
High
Extreme
0
50
100
200
300
400
Kilometers
N
Umatilla River
North Fork John Day River
John Day River
North Fork Malheur River
Malheur River
Columbia River
Deschutes River
McKenzie River

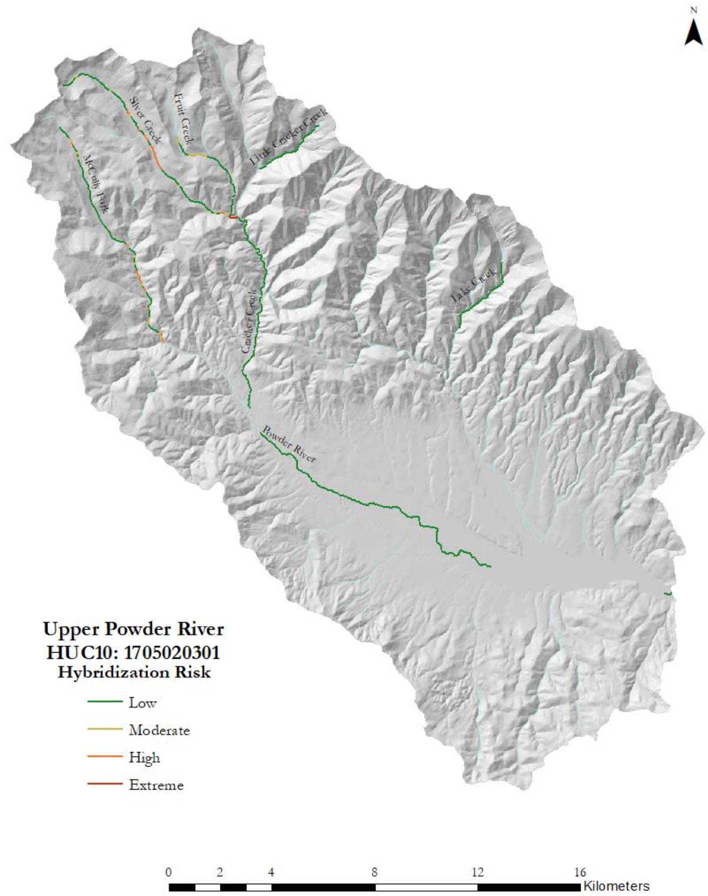

N
Upper Malheur River
HUC8: 17050116
Hybridization Risk
Low
Moderate
High
Extreme
0 5 10 20 30 40
Kilometers

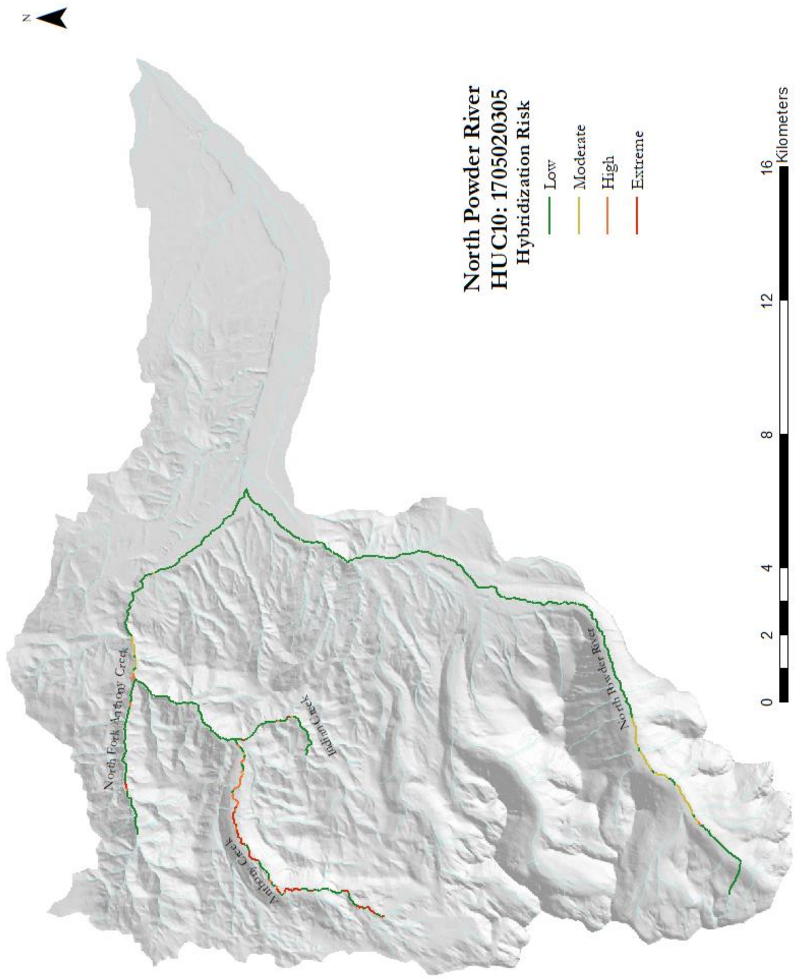

Meadow Fork Big Creek
Big Creek
Lake Creek
Summit Creek
Malheur River
Headwaters Malheur River
HUC10: 1705011601
Hybridization Risk
Low
Moderate
High
Extreme
0
2.5
5
10
15
20
Kilometers
N

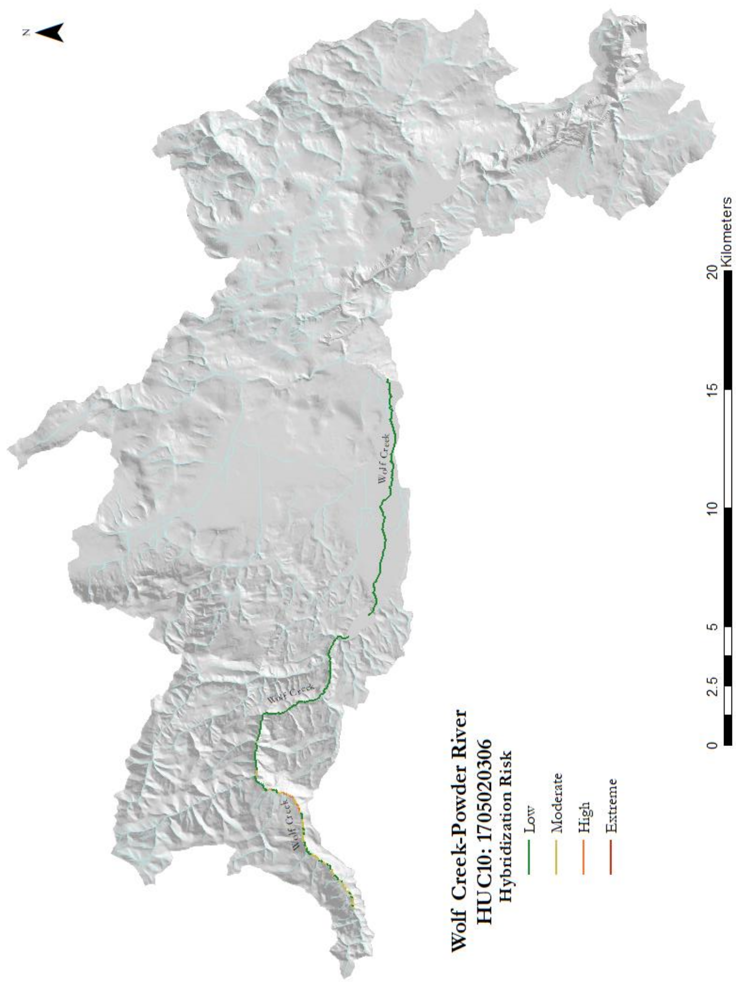

Upper North Fork Malheur River
HUC10: 1705011611
Hybridization Risk
Low
Moderate
High
Extreme
N
Swamp Creek
Flat Creek
Cow Creek
Sheep Creek
North Fork Elk Creek
South Fork Elk Creek
North Fork Malheur River
Little Camp Creek
0
2
4
8
12
16
Kilometers

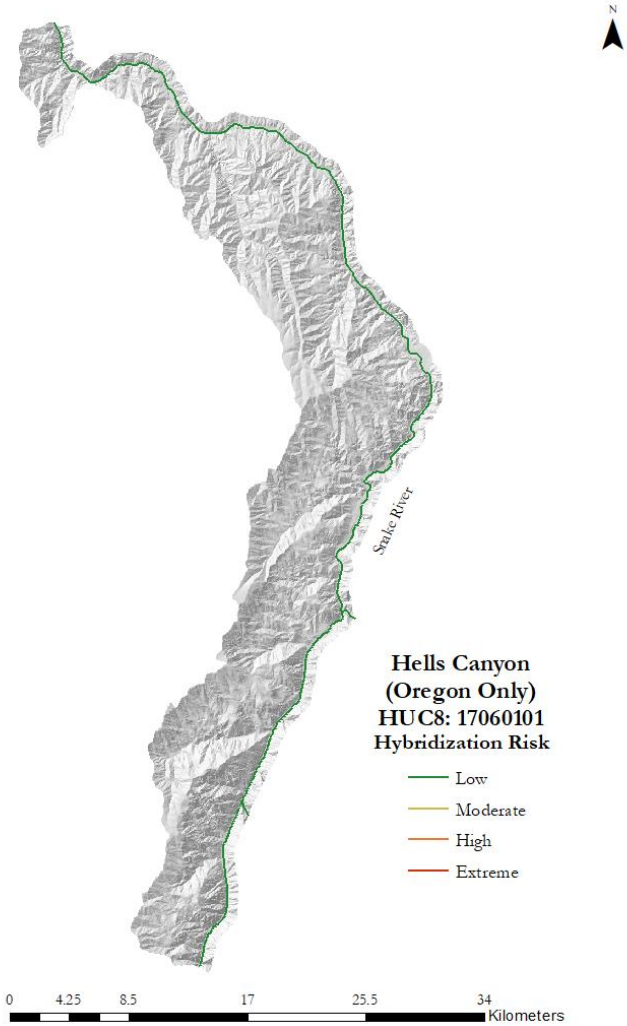

Brownlee Reservoir
(Oregon Only)
HUC8: 17050201
Hybridization Risk
Low
Moderate
High
Extreme
Duck Creek
Elk Creek
Lake Fork Creek
North Pine Creek
Clear Creek
Fish Creek
N
0 5 10 20 30 40
Kilometers

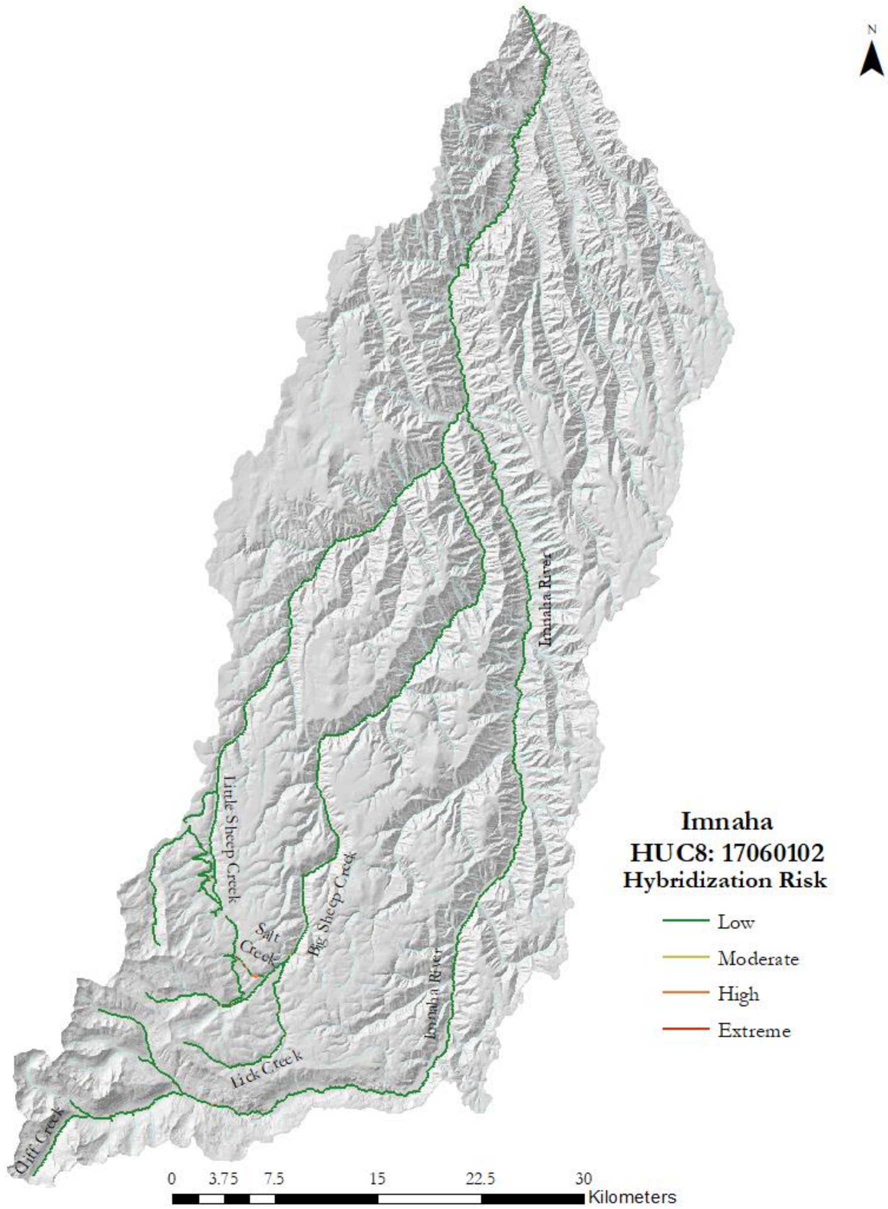

N
Powder
HUC8: 17050203
Hybridization Risk
Low
Moderate
High
Extreme
0
5
10
20
30
40
Kilometers
Eagle Creek
West Eagle Creek
Wolf Creek
North Fork Anthony Creek
North Powder River
Silver Creek
McCully Fork

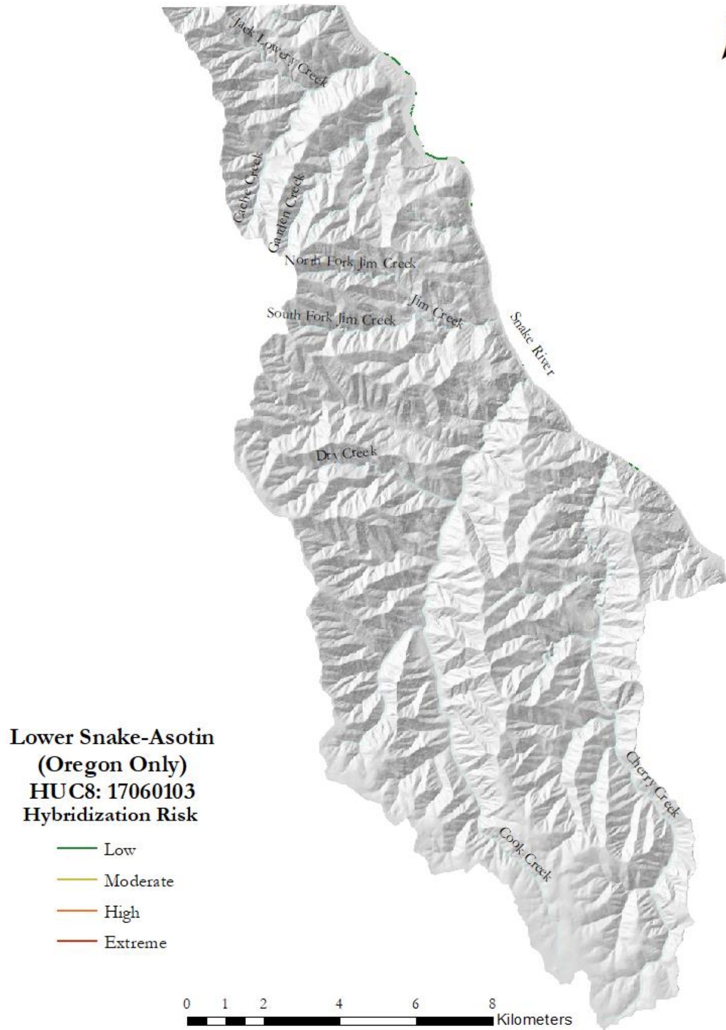

N
Silver Creek
Fruit Creek
Little Cracker Creek
McCully Fork
Cracker Creek
Lake Creek
Powder River
Upper Powder River
HUC10: 1705020301
Hybridization Risk
Low
Moderate
High
Extreme
0
2
4
8
12
16
Kilometers

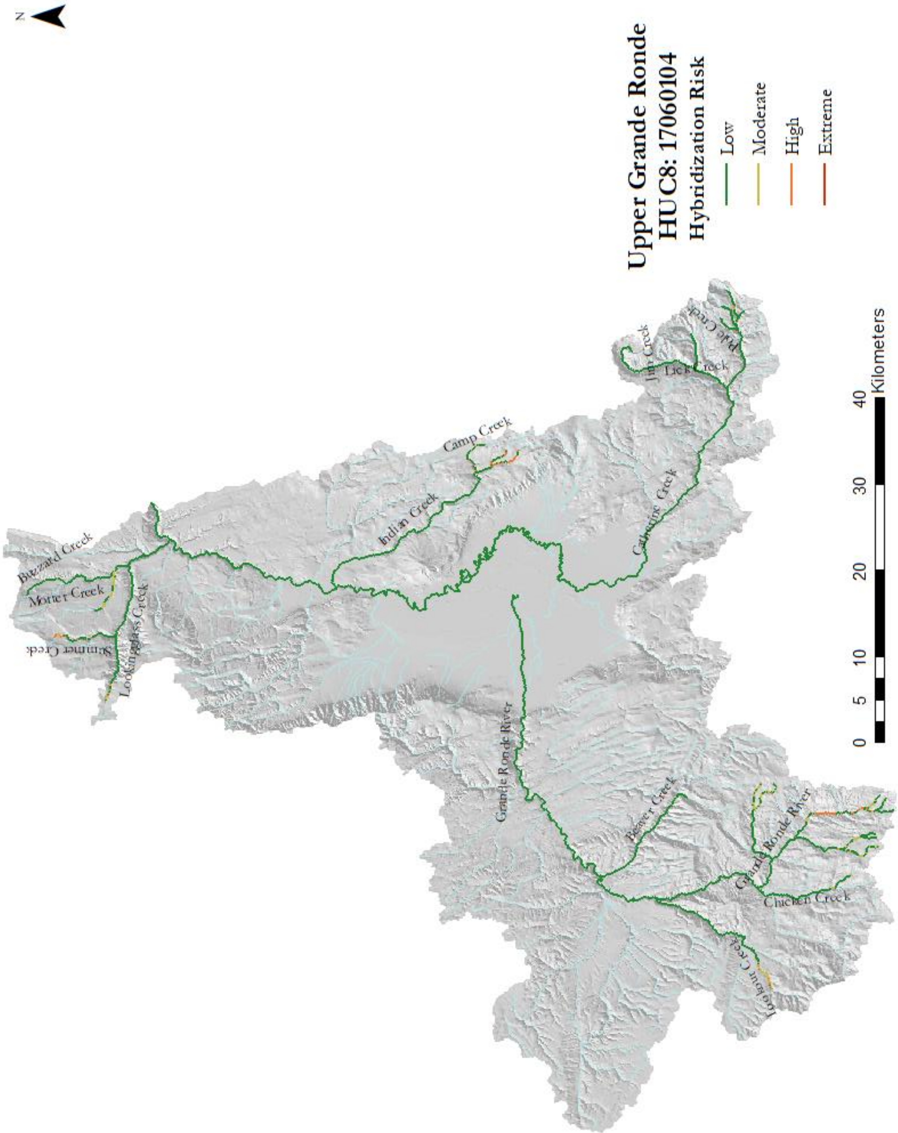

North Powder River
HUC10: 1705020305
Hybridization Risk
Low
Moderate
High
Extreme
0
2
4
8
12
16
Kilometers

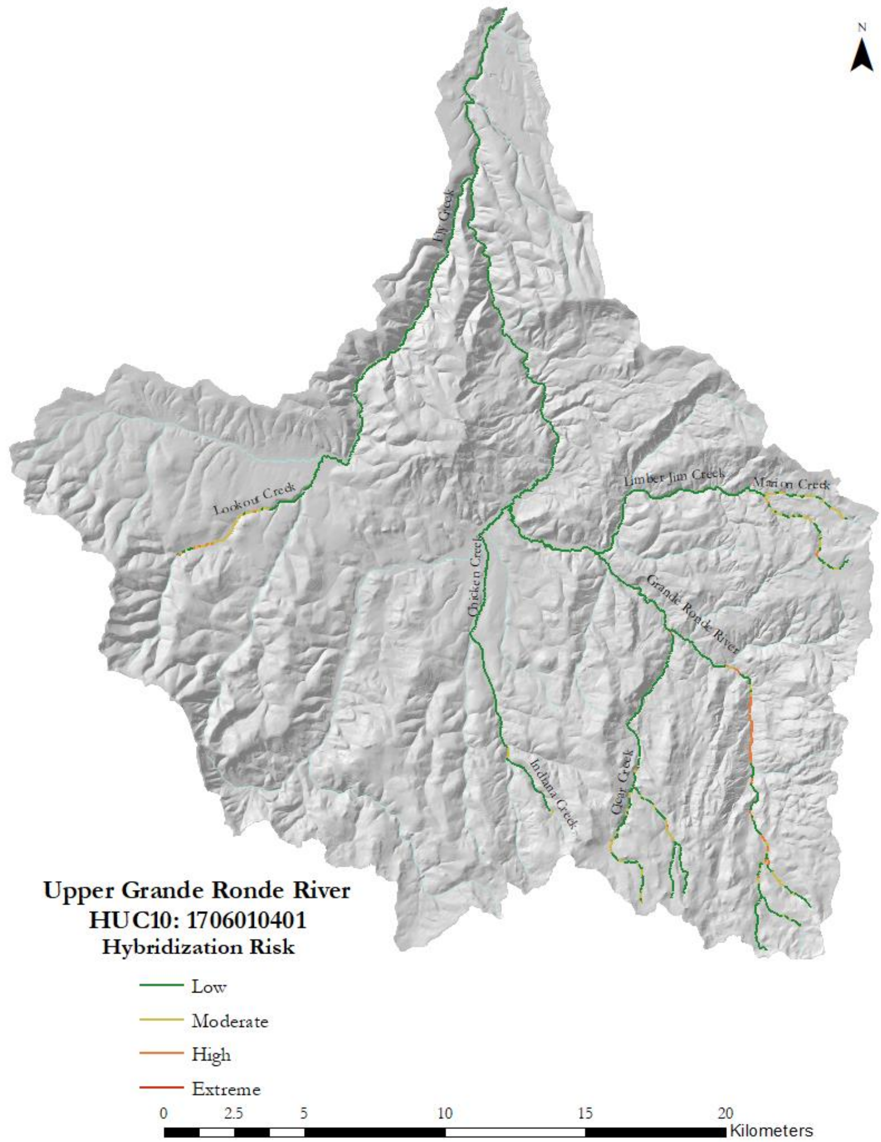

Wolf Creek-Powder River
HUC10: 1705020306
Hybridization Risk
Low
Moderate
High
Extreme
Wolf Creek
Wolf Creek
Wolf Creek
0
2.5
5
10
15
20
Kilometers
N

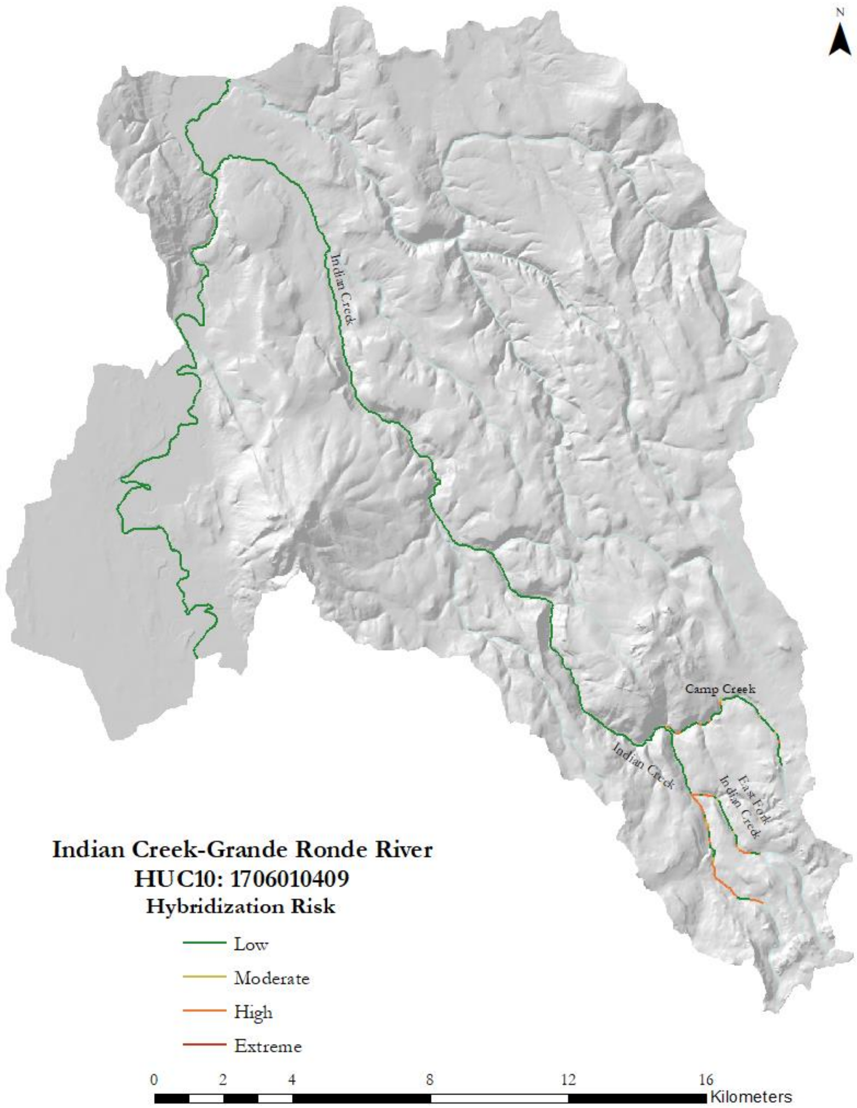

N
Snake River
Hells Canyon
(Oregon Only)
HUC8: 17060101
Hybridization Risk
Low
Moderate
High
Extreme
0
4.25
8.5
17
25.5
34
Kilometers

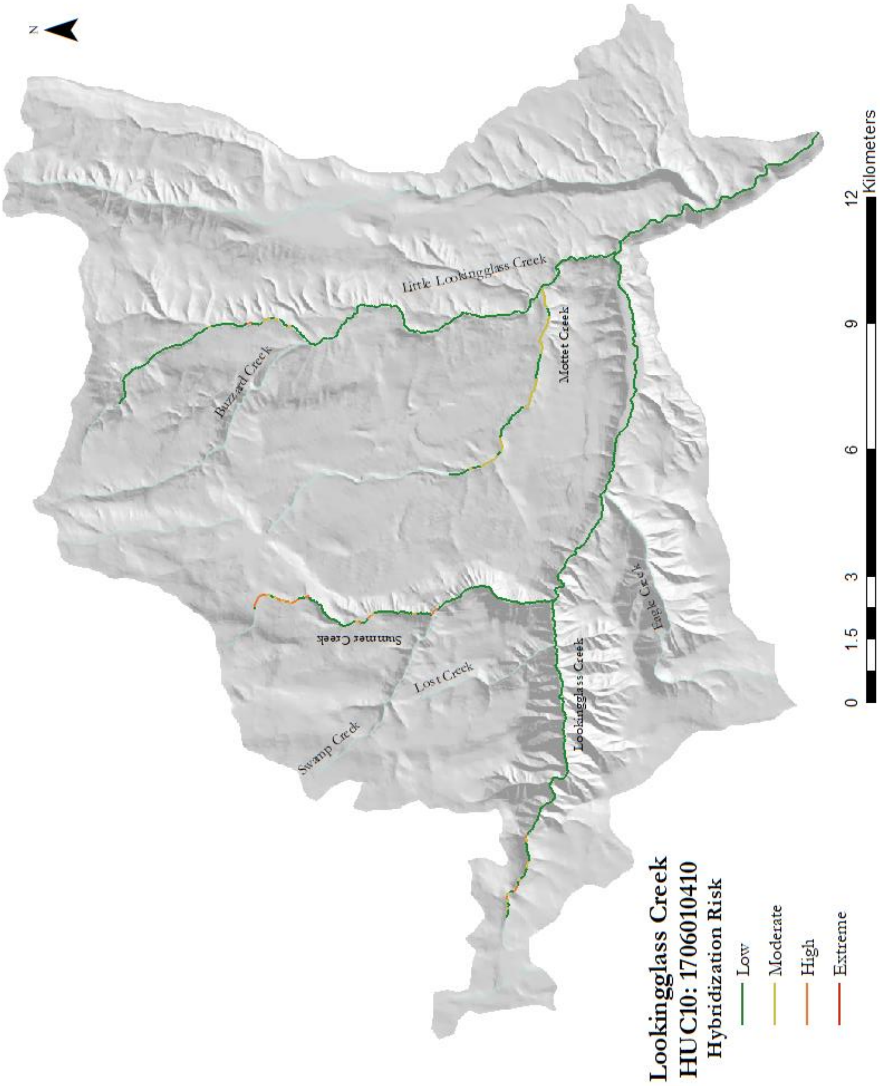

N
Imnaha
HUC8: 17060102
Hybridization Risk
Low
Moderate
High
Extreme
Imnaha River
Imnaha River
Little Sheep Creek
Big Sheep Creek
Salt Creek
Lick Creek
Cliff Creek
0
3.75
7.5
15
22.5
30
Kilometers

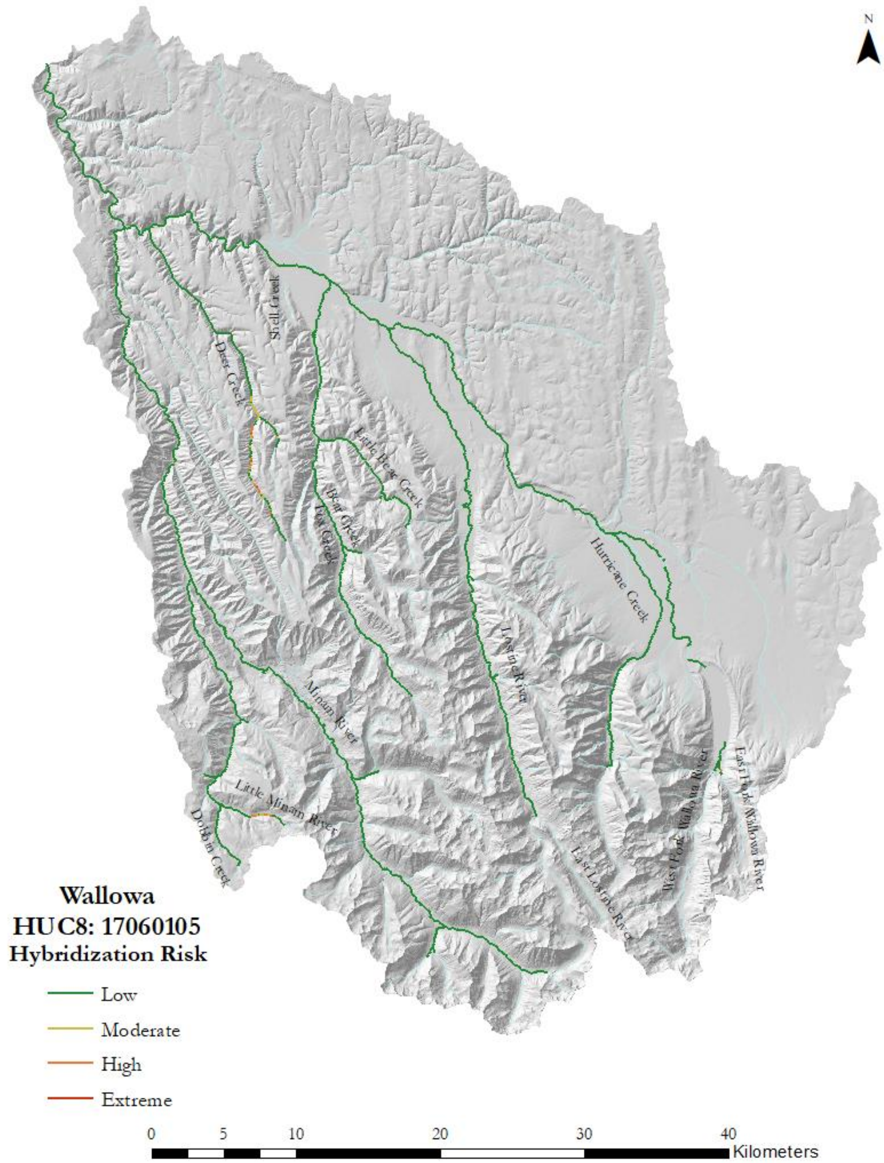

N
Jack Lowery Creek
Cache Creek
Garden Creek
North Fork Jim Creek
South Fork Jim Creek
Jim Creek
Snake River
Dry Creek
Cherry Creek
Cook Creek
Lower Snake-Asotin
(Oregon Only)
HUC8: 17060103
Hybridization Risk
Low
Moderate
High
Extreme
0 1 2 4 6 8
Kilometers

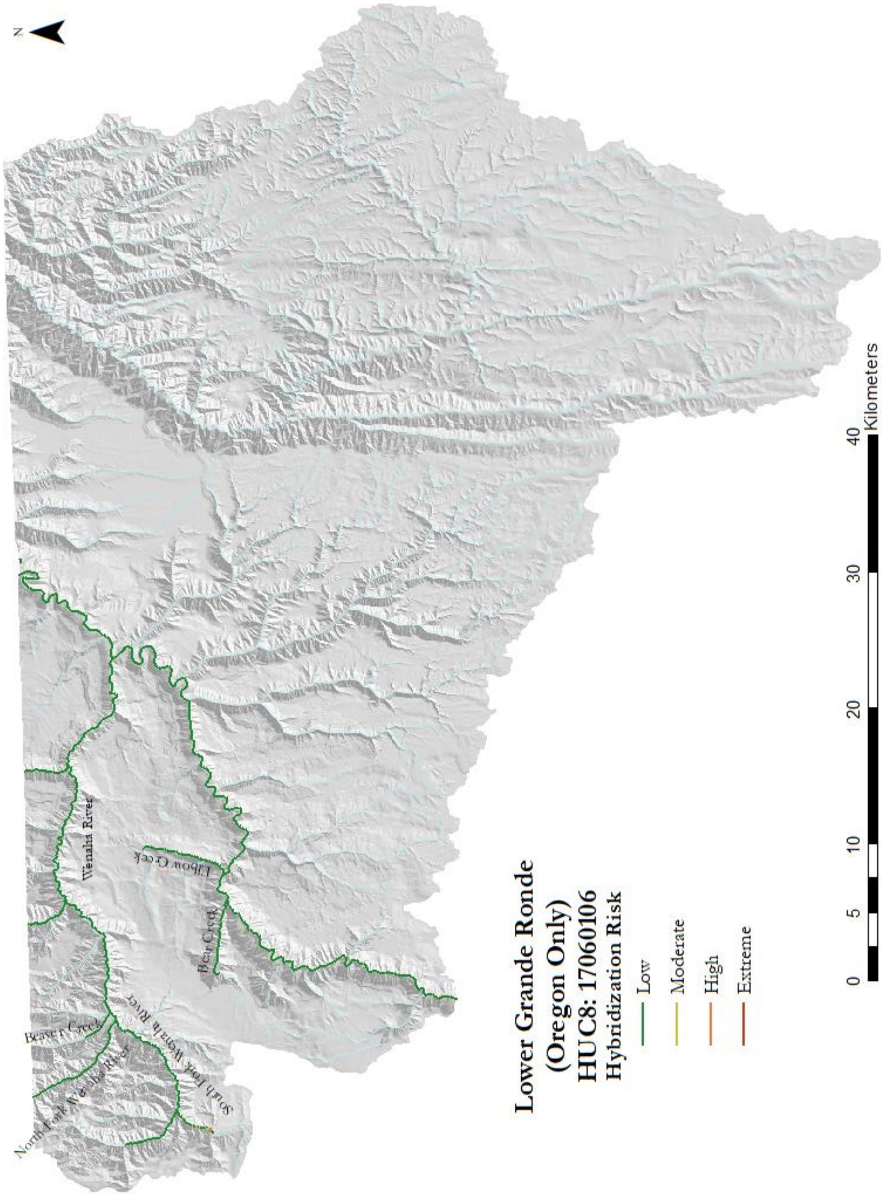

Upper Grande Ronde
HUC8: 17060104
Hybridization Risk
Low
Moderate
High
Extreme
0 5 10 20 30 40 Kilometers
N
Buzzard Creek
Summer Creek
Indian Creek
Camp Creek
Lick Creek
Grande Ronde River
Chicken Creek

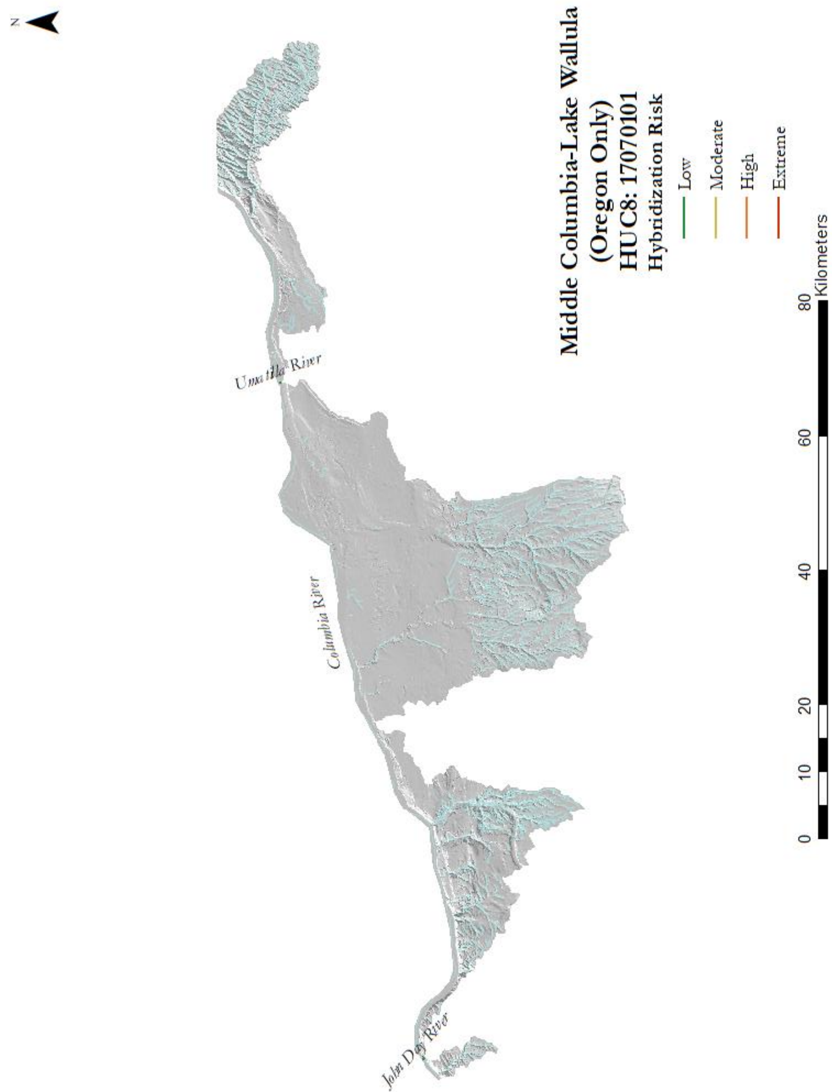

N
Lookout Creek
Chicken Creek
Limber Jim Creek
Marion Creek
Grande Ronde River
Indiana Creek
Clear Creek
Upper Grande Ronde River
HUC10: 1706010401
Hybridization Risk
Low
Moderate
High
Extreme
0
2.5
5
10
15
20
Kilometers


N
Indian Creek
Camp Creek
Indian Creek
East Fork Indian Creek
Indian Creek-Grande Ronde River
HUC10: 1706010409
Hybridization Risk
Low
Moderate
High
Extreme
0 2 4 8 12 16 Kilometers

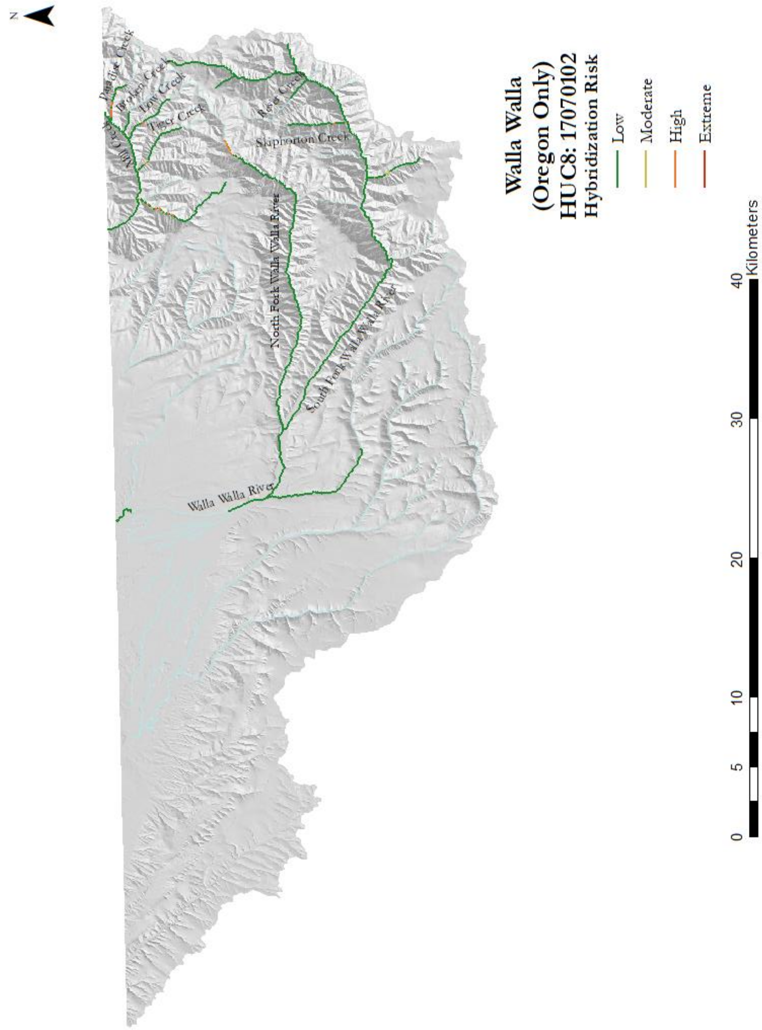

N
Little Lookingglass Creek
Mottet Creek
Buzzard Creek
Summer Creek
Lost Creek
Swamp Creek
Lookingglass Creek
Eagle Creek
0 1.5 3 6 9 12
Kilometers
Lookingglass Creek
HUC10: 1706010410
Hybridization Risk
Low
Moderate
High
Extreme


N
Deer Creek
Little Bear Creek
Bear Creek
Hurricane Creek
Lostine River
Minam River
Little Minam River
Dobbin Creek
East Lostine River
West Fork Wallowa River
East Fork Wallowa River
Wallowa
HUC8: 17060105
Hybridization Risk
Low
Moderate
High
Extreme
0
5
10
20
30
40
Kilometers

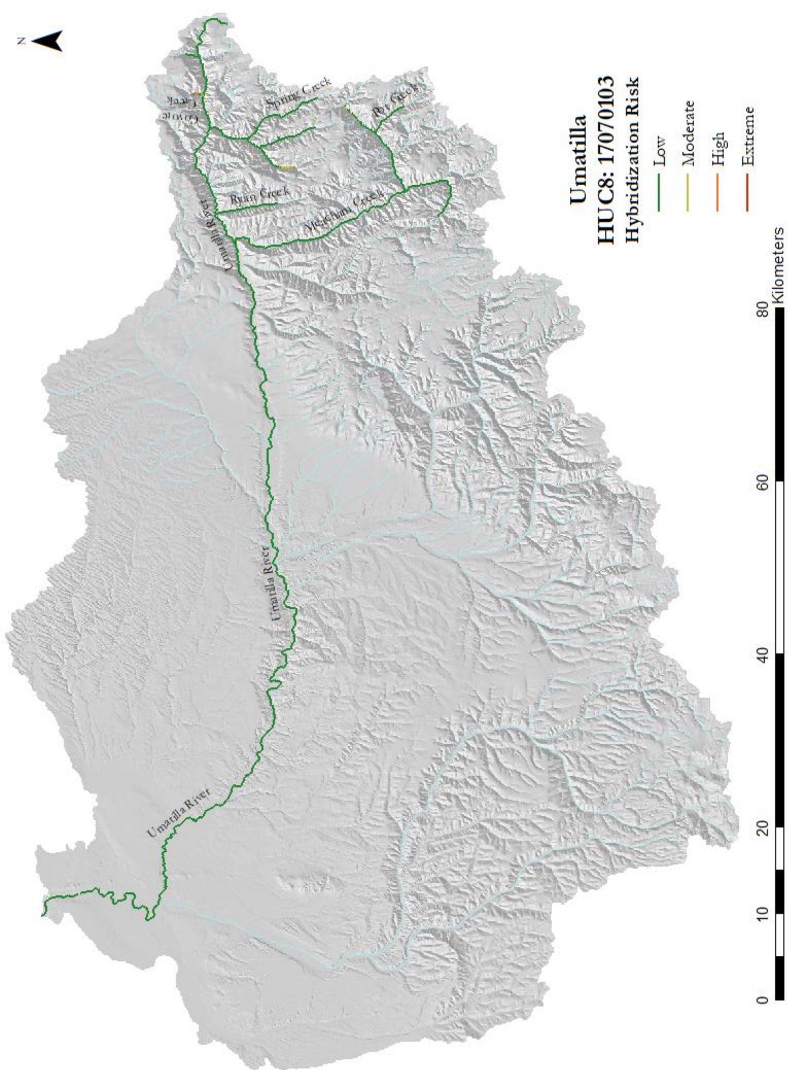

Lower Grande Ronde
(Oregon Only)
HUC8: 17060106
Hybridization Risk
Low
Moderate
High
Extreme
0
5
10
20
30
40
Kilometers
N
Wenaha River
Elbow Creek
Beaver Creek
South Fork Wenaha River
North Fork Wenaha River

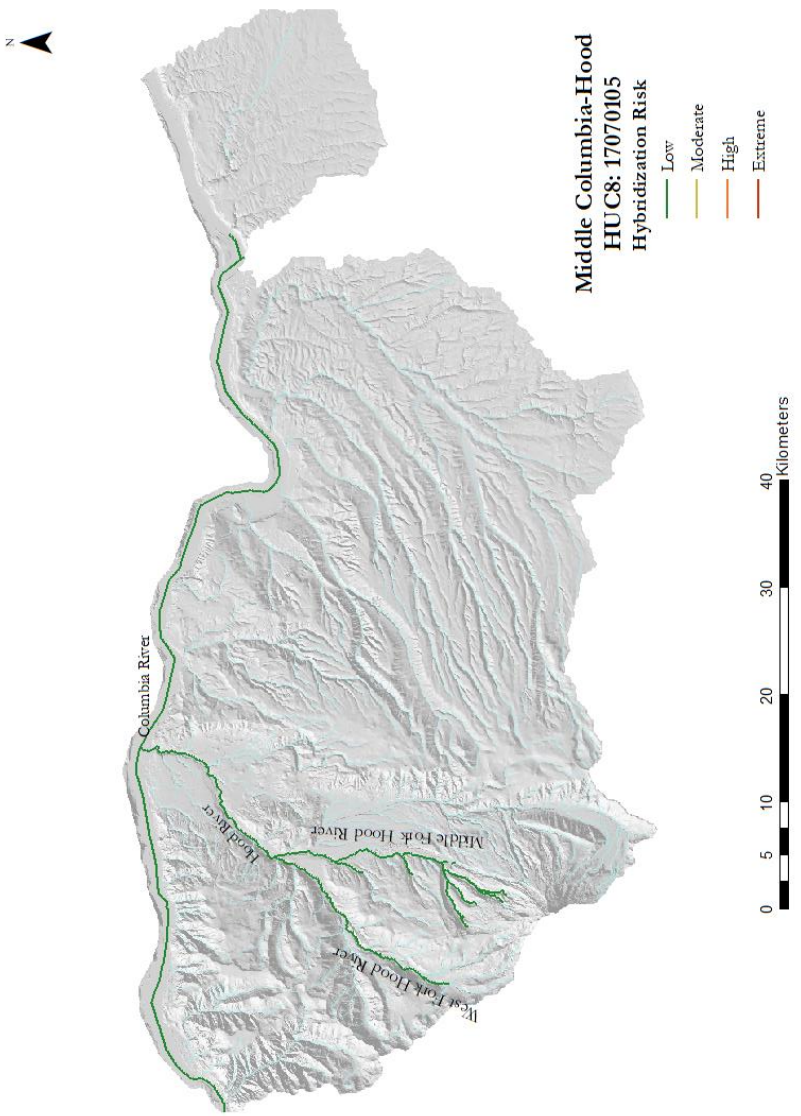


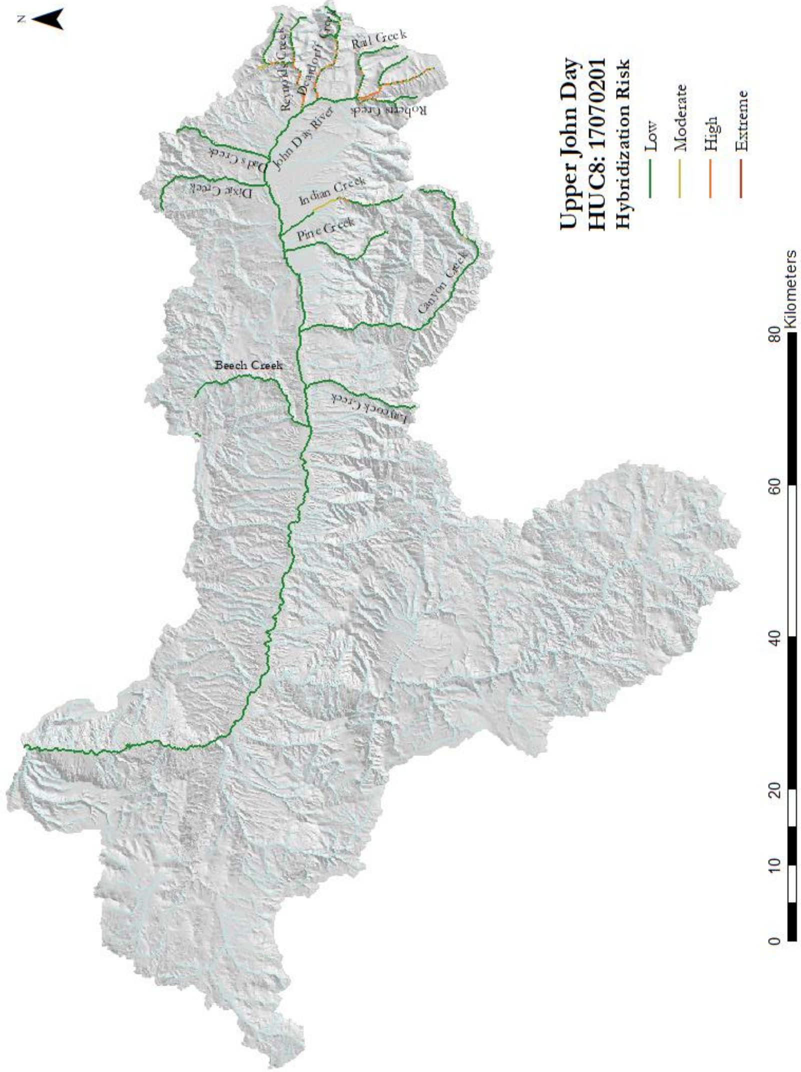
N
Middle Columbia-Lake Wallula
(Oregon Only)
HUC8: 17070101
Hybridization Risk
Low
Moderate
High
Extreme
0
10
20
40
60
80
Kilometers
Umatilla River
Columbia River
John Day River

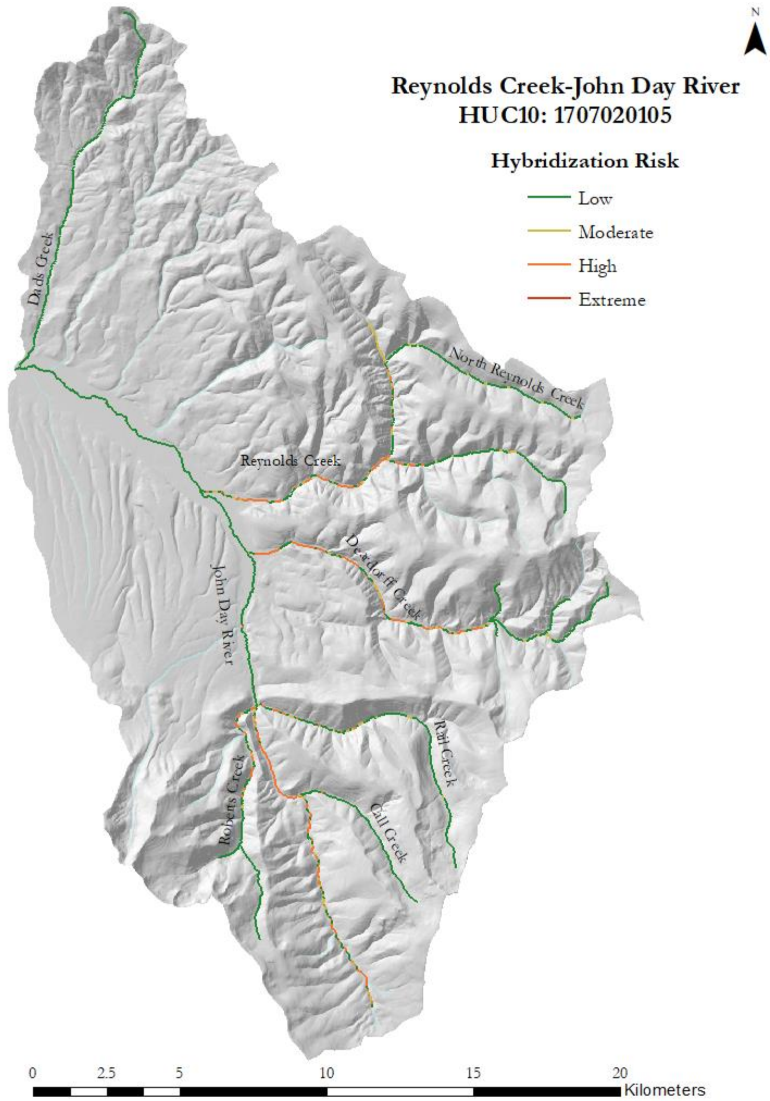


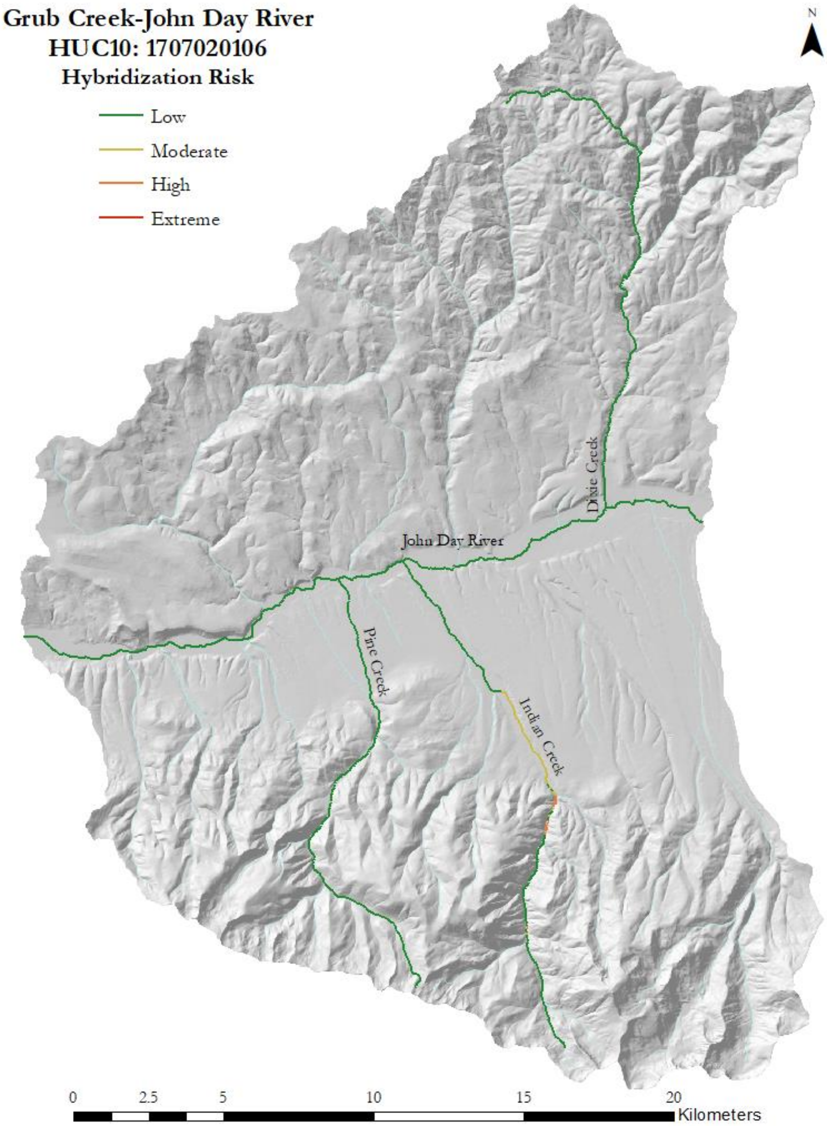
N
Walla Walla
(Oregon Only)
HUC8: 17070102
Hybridization Risk
Low
Moderate
High
Extreme
0
5
10
20
30
40
Kilometers
North Fork Walla Walla River
South Fork Walla Walla River
Walla Walla River


N
Umatilla
HUC8: 17070103
Hybridization Risk
Low
Moderate
High
Extreme
0
10
20
40
60
80
Kilometers
Umatilla River
Spring Creek
Ryan Creek
Meacham Creek

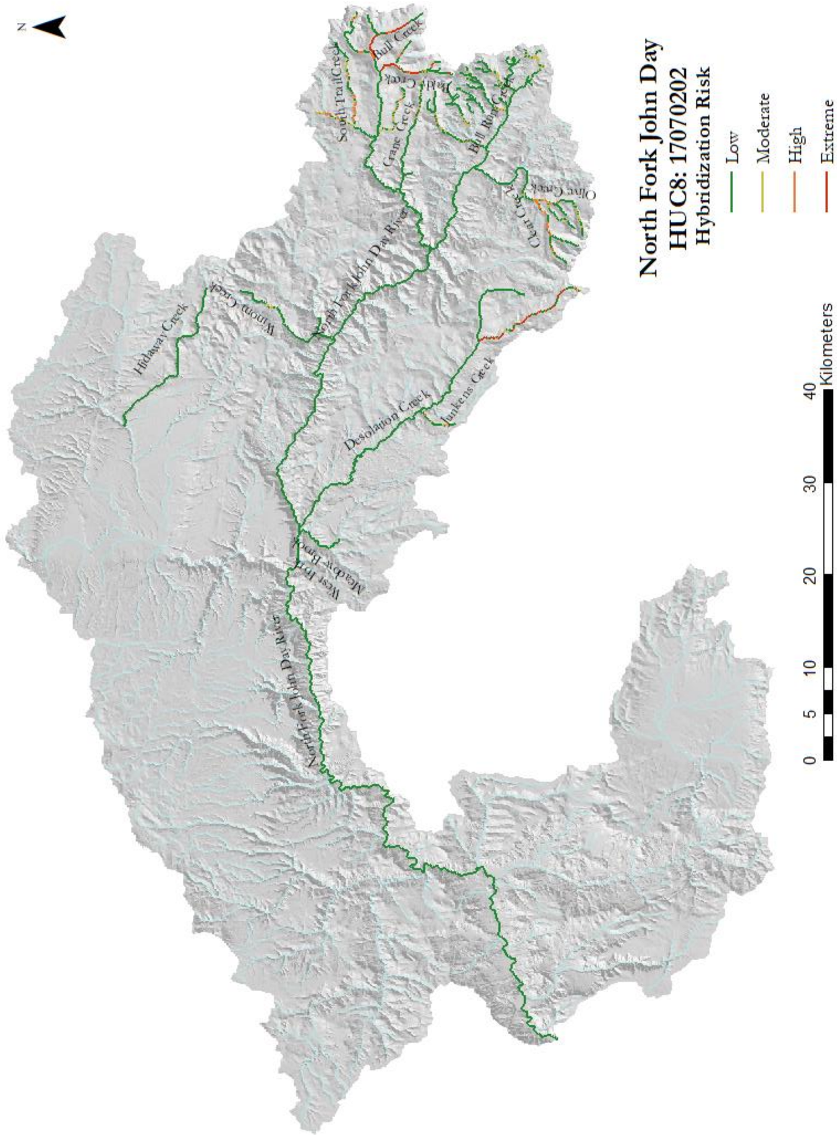

N
Middle Columbia-Hood
HUC8: 17070105
Hybridization Risk
Low
Moderate
High
Extreme
Columbia River
Hood River
Middle Fork Hood River
West Fork Hood River
0 5 10 20 30 40
Kilometers

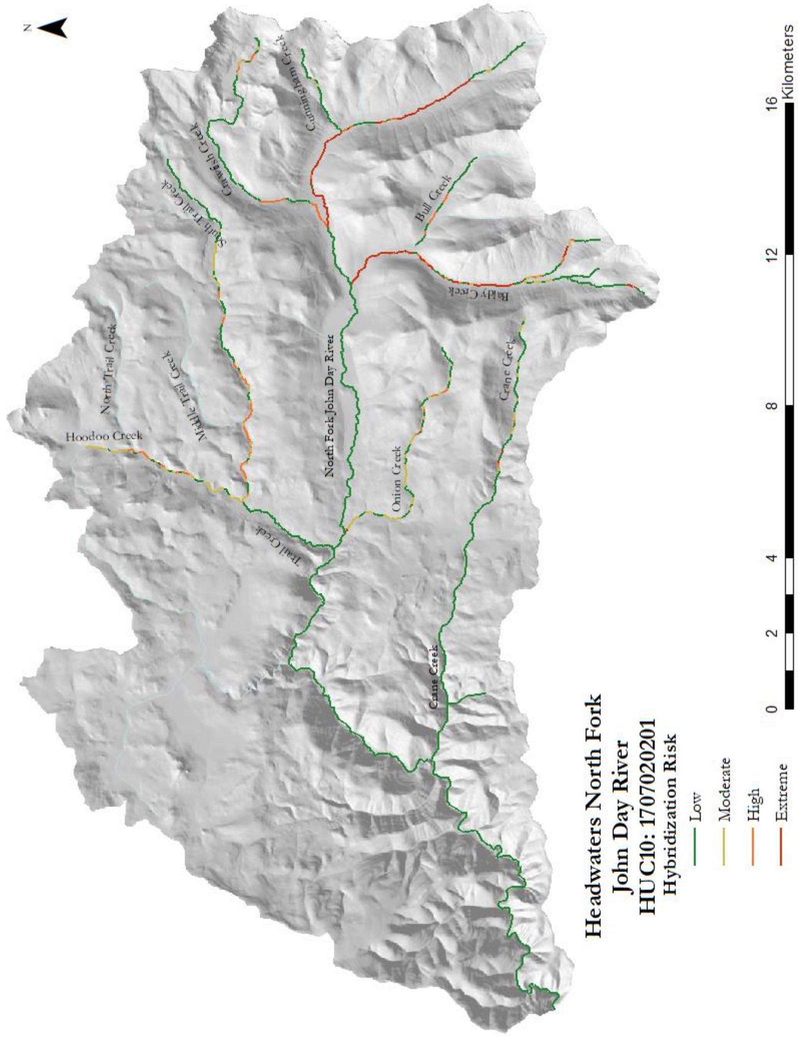

N
Upper John Day
HUC8: 17070201
Hybridization Risk
Low
Moderate
High
Extreme
Kilometers
0
10
20
40
60
80
Rail Creek
Roberts Creek
John Day River
Dixie Creek
Indian Creek
Pine Creek
Canyon Creek
Beech Creek
Laycock Creek

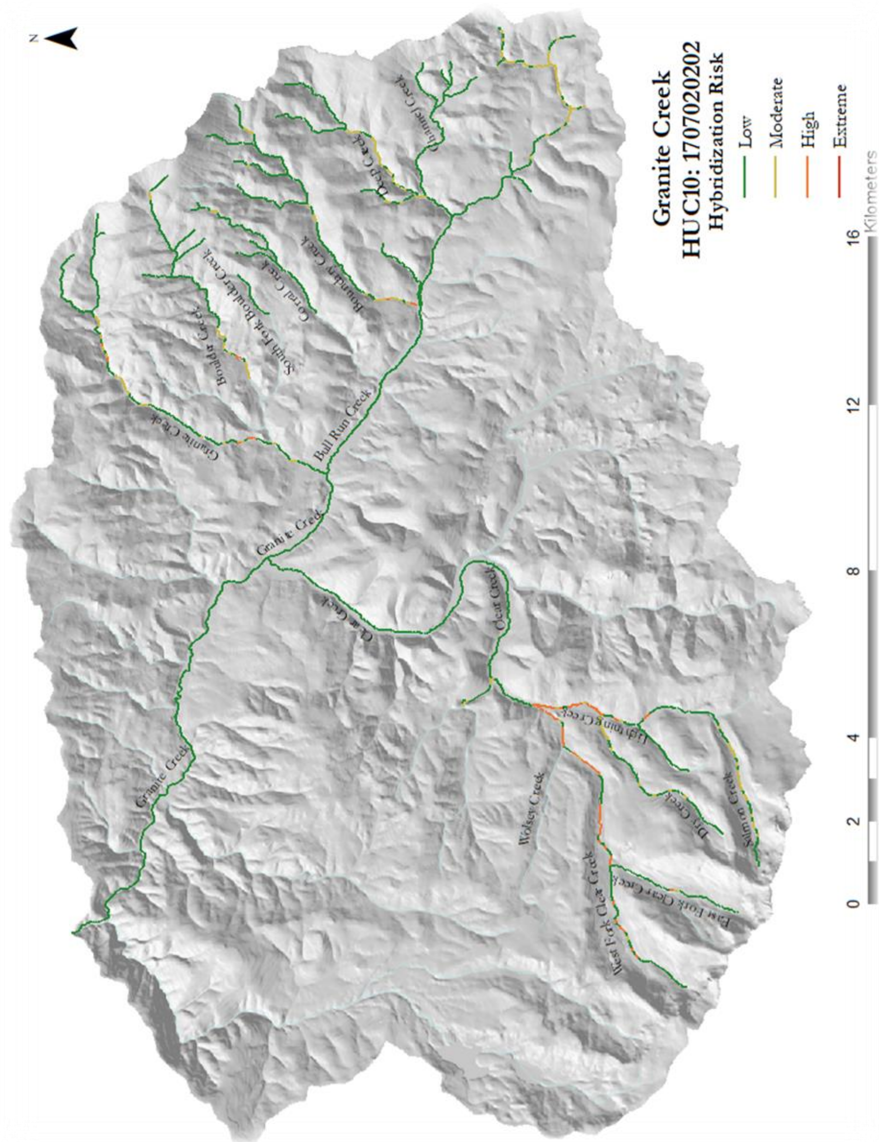

Reynolds Creek-John Day River
HUC10: 1707020105
Hybridization Risk
Low
Moderate
High
Extreme
N
Dads Creek
North Reynolds Creek
Reynolds Creek
Deardorff Creek
John Day River
Rail Creek
Roberts Creek
Call Creek
0
2.5
5
10
15
20
Kilometers



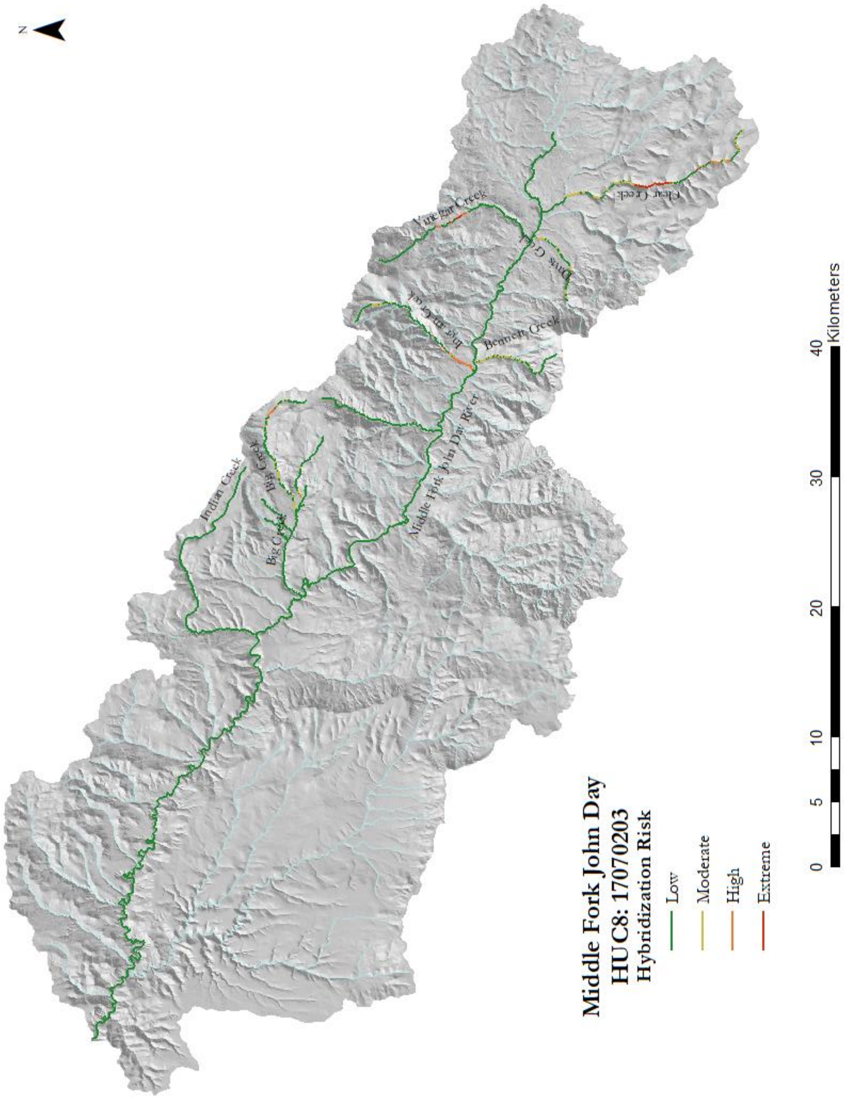
Grub Creek-John Day River
HUC10: 1707020106
Hybridization Risk
Low
Moderate
High
Extreme
John Day River
Dixie Creek
Pine Creek
Indian Creek
0
2.5
5
10
15
20
Kilometers
N

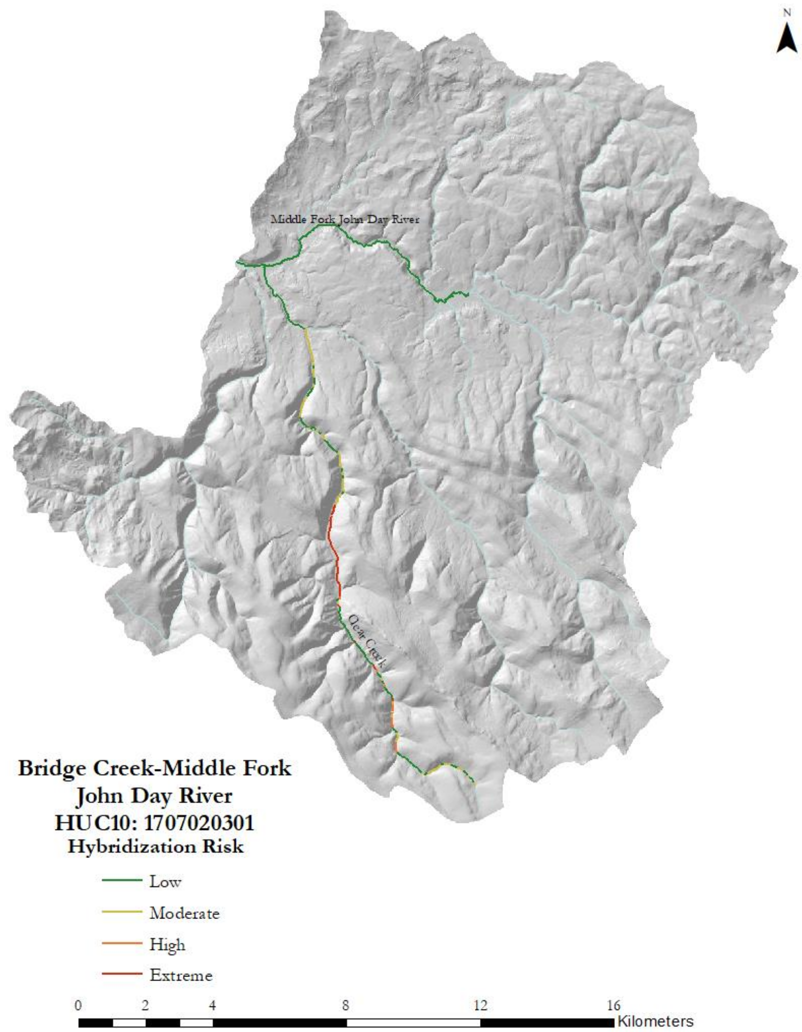

North Fork John Day
HUC8: 17070202
Hybridization Risk
Low
Moderate
High
Extreme
0 5 10 20 30 40 Kilometers
Hidaway Creek
North Fork John Day River
Desolation Creek

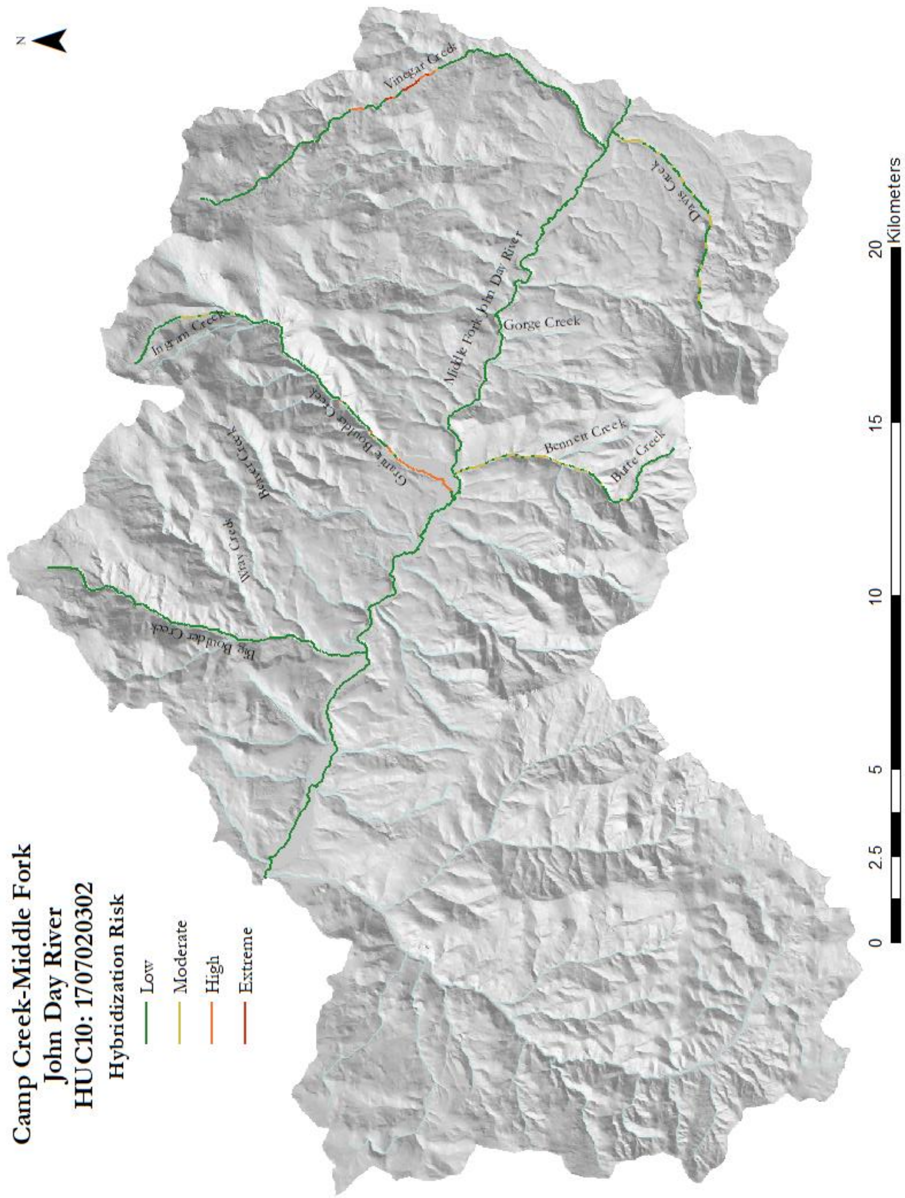

Headwaters North Fork
John Day River
HUC10: 1707020201
Hybridization Risk
Low
Moderate
High
Extreme
0
2
4
8
12
16
Kilometers
Cunningham Creek
Crawfish Creek
South Trail Creek
North Trail Creek
Middle Trail Creek
Hoodoo Creek
Trail Creek
North Fork John Day River
Onion Creek
Bull Creek
Baldy Creek
Crane Creek
Crane Creek


Granite Creek
HUC10: 1707020202
Hybridization Risk
Low
Moderate
High
Extreme
0
2
4
8
12
16
Kilometers
Granite Creek
Bull Run Creek
Boulder Creek
South Fork Boulder Creek
Corral Creek
Clear Creek
Wolsey Creek
Dry Creek
West Fork Clear Creek
East Fork Clear Creek

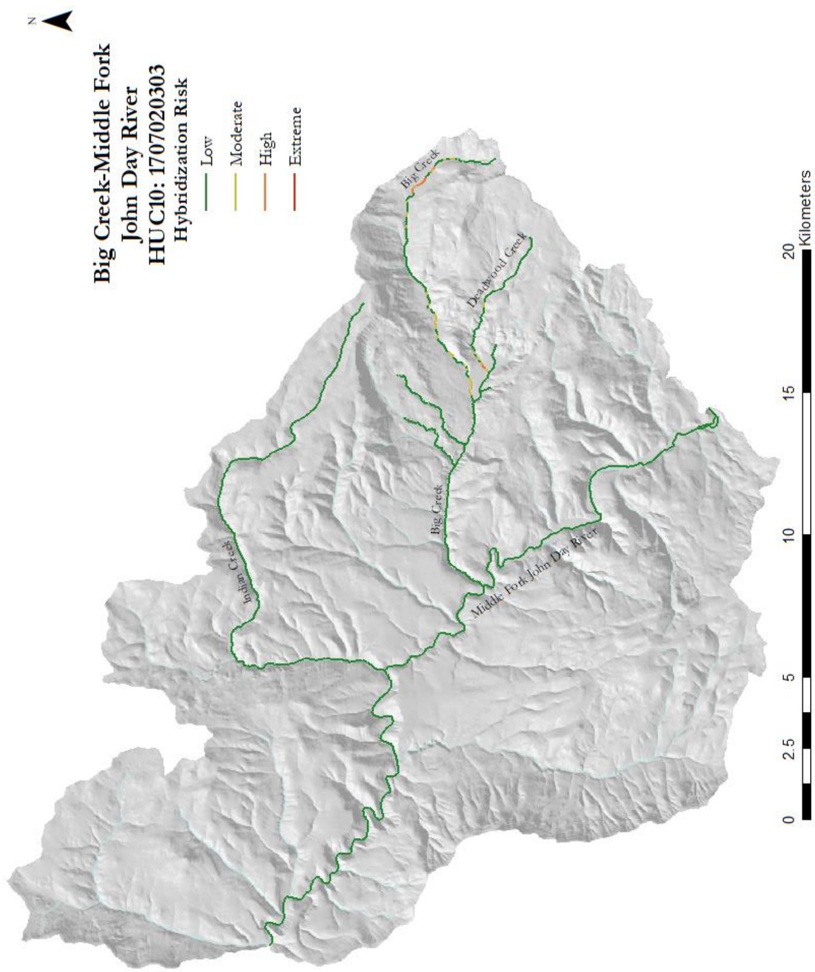

N
Desolation Creek
North Fork Desolation Creek
Junkens Creek
South Fork Desolation Creek
Desolation Creek
HUC10: 1707020204
Hybridization Risk
Low
Moderate
High
Extreme
0
2.5
5
10
15
20
Kilometers

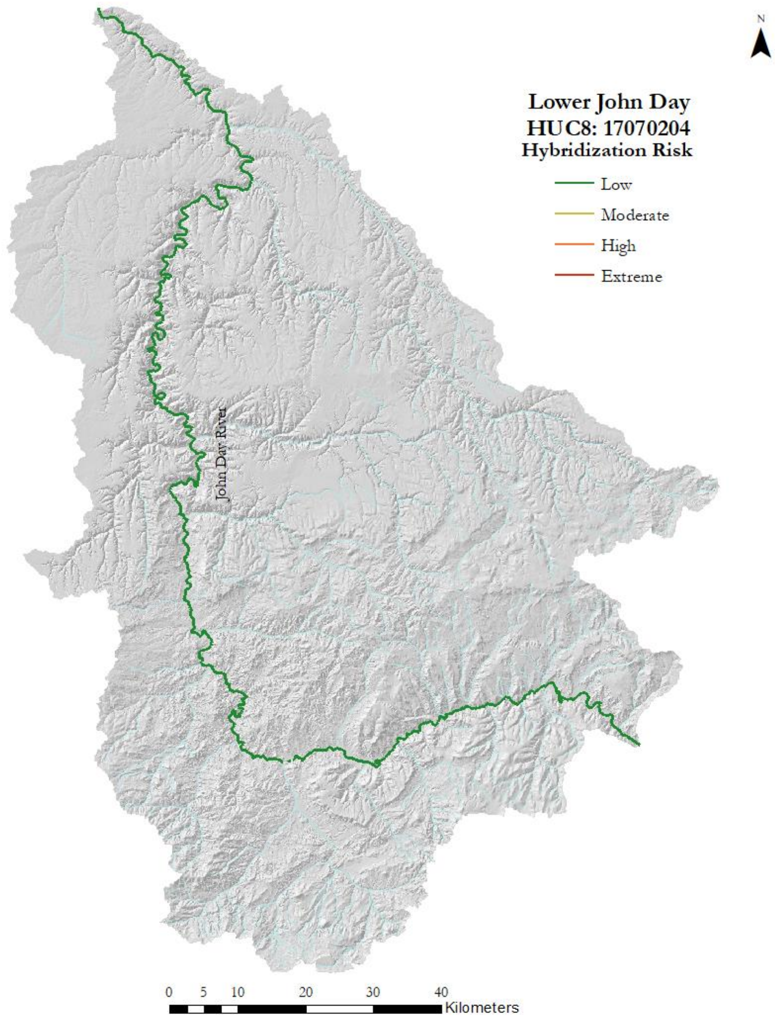

N
Vinegar Creek
Clear Creek
Indian Creek
Big Creek
Middle Fork John Day River
Middle Fork John Day
HUC8: 17070203
Hybridization Risk
Low
Moderate
High
Extreme
0 5 10 20 30 40 Kilometers

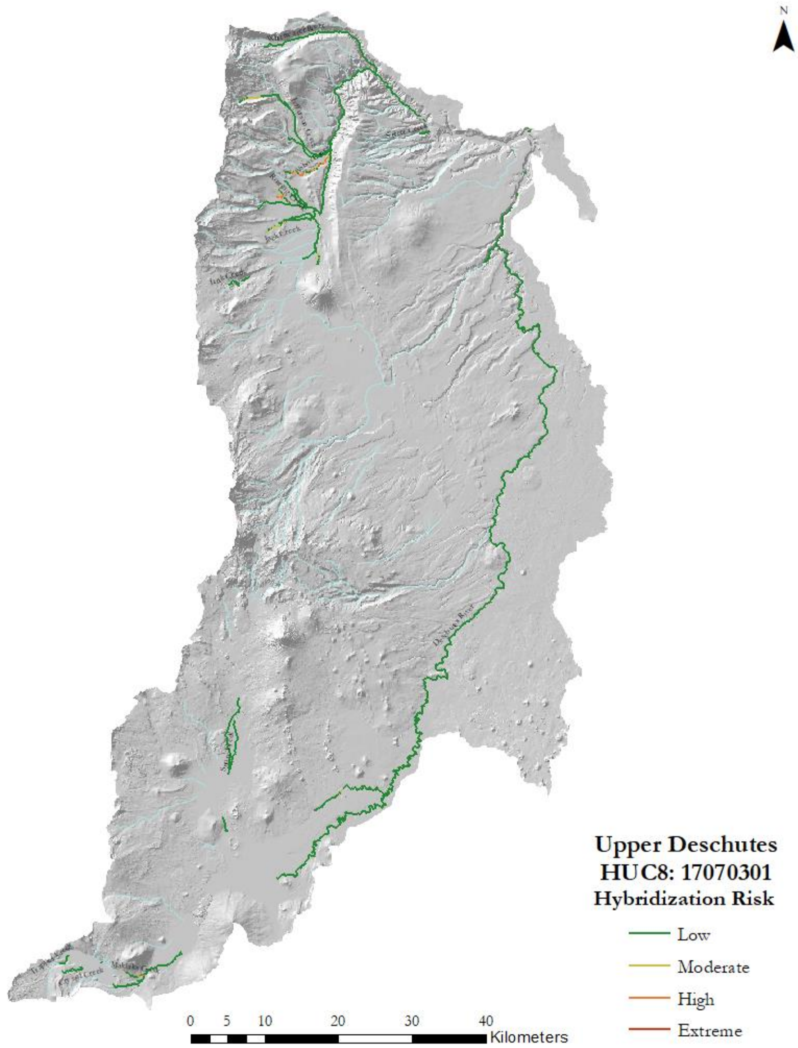

N
Middle Fork John Day River
Bridge Creek-Middle Fork
John Day River
HUC10: 1707020301
Hybridization Risk
Low
Moderate
High
Extreme
0
2
4
8
12
16
Kilometers

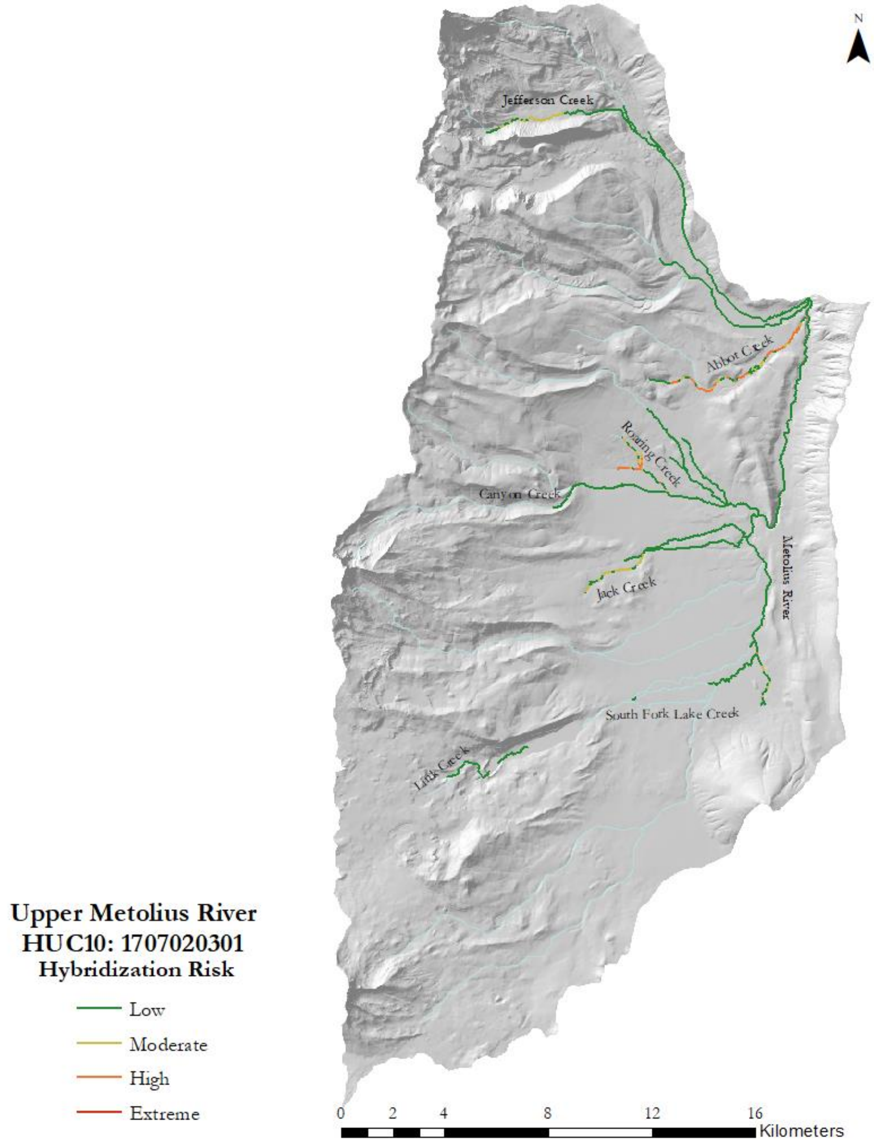


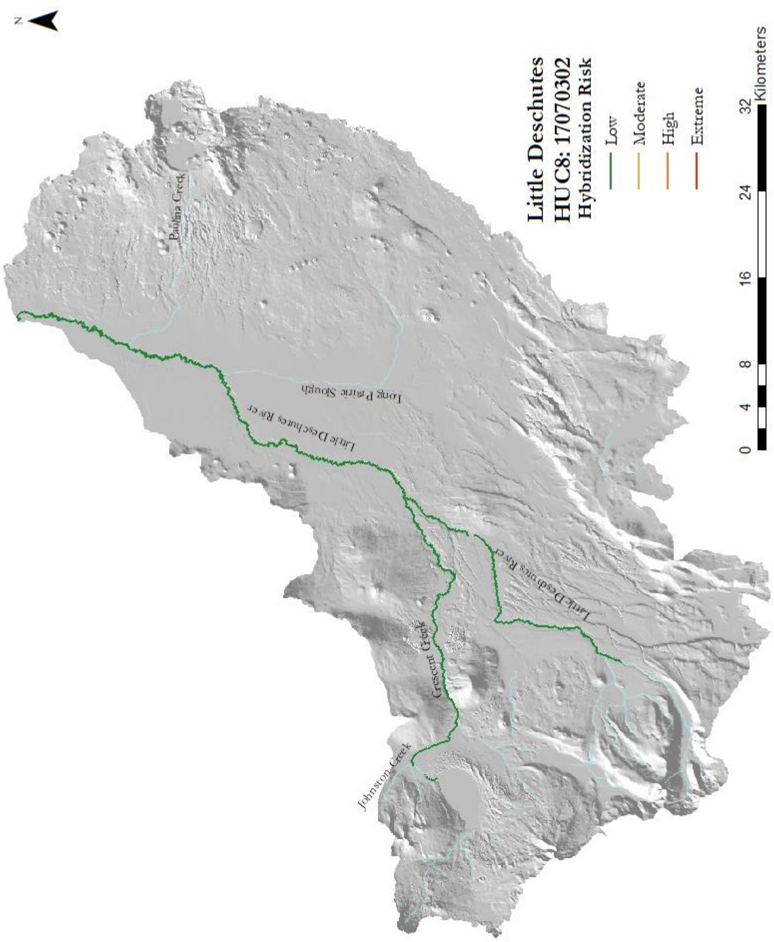
Camp Creek-Middle Fork
John Day River
HUC10: 1707020302
Hybridization Risk
Low
Moderate
High
Extreme
N
Vinegar Creek
Davis Creek
Middle Fork John Day River
Gorge Creek
Ingram Creek
Granite Boulder Creek
Bennett Creek
Butte Creek
Beaver Creek
Wray Creek
Big Boulder Creek
0
2.5
5
10
15
20
Kilometers

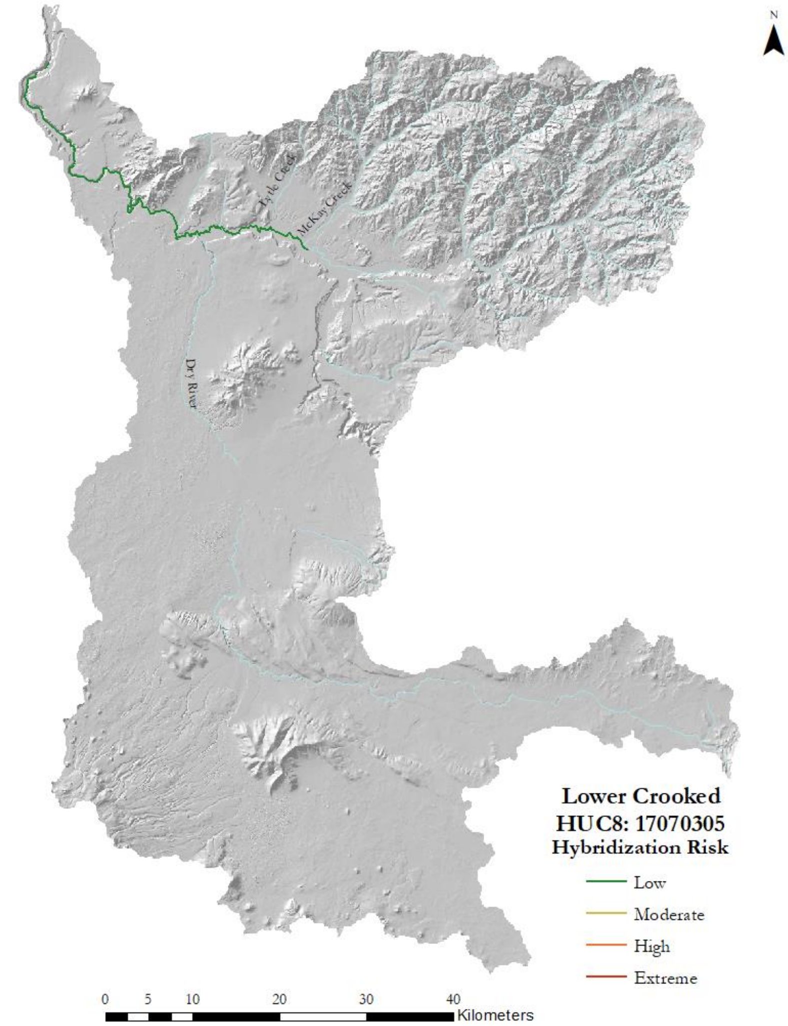

Big Creek-Middle Fork
John Day River
HUC10: 1707020303
Hybridization Risk
Low
Moderate
High
Extreme
N
Big Creek
Deadwood Creek
Big Creek
Indian Creek
Middle Fork John Day River
0
2.5
5
10
15
20
Kilometers


Lower John Day
HUC8: 17070204
Hybridization Risk
Low
Moderate
High
Extreme
N
John Day River
0 5 10 20 30 40
Kilometers

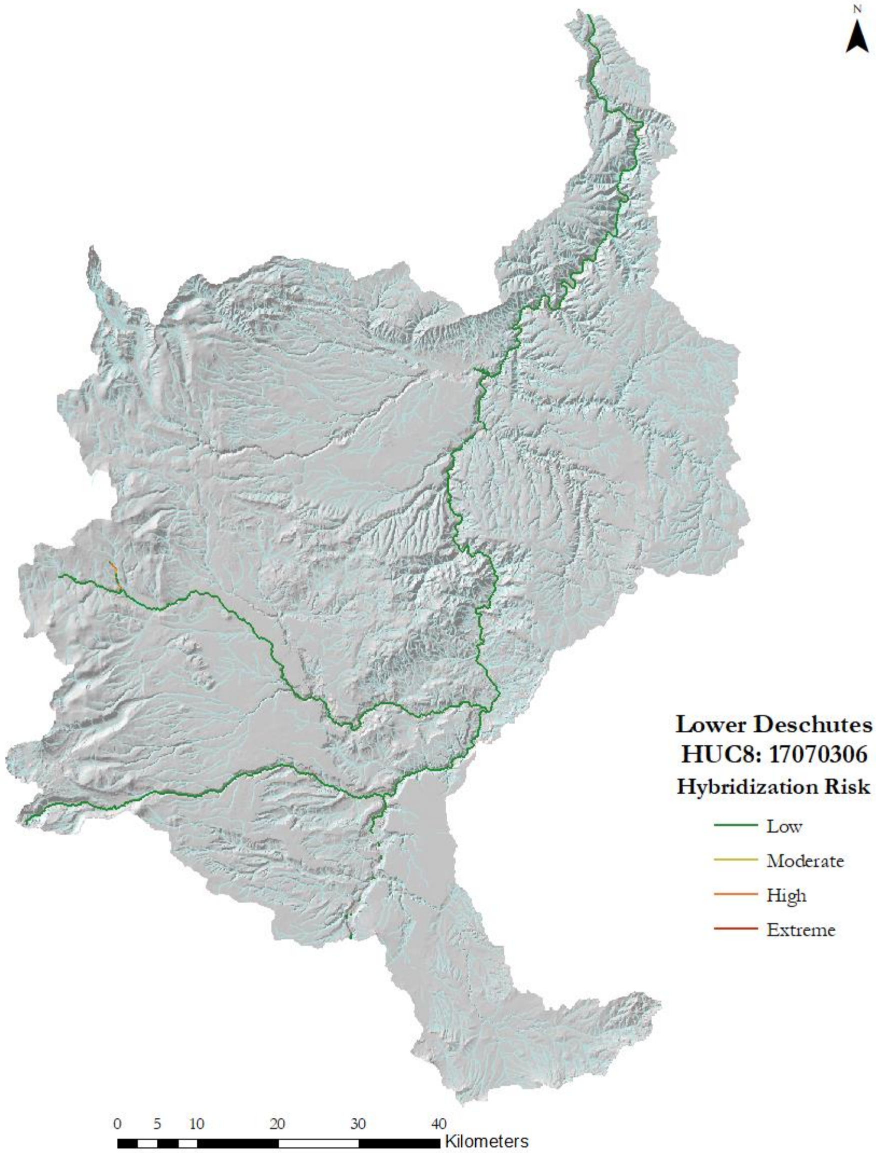

N
Upper Deschutes
HUC8: 17070301
Hybridization Risk
Low
Moderate
High
Extreme
0 5 10 20 30 40
Kilometers

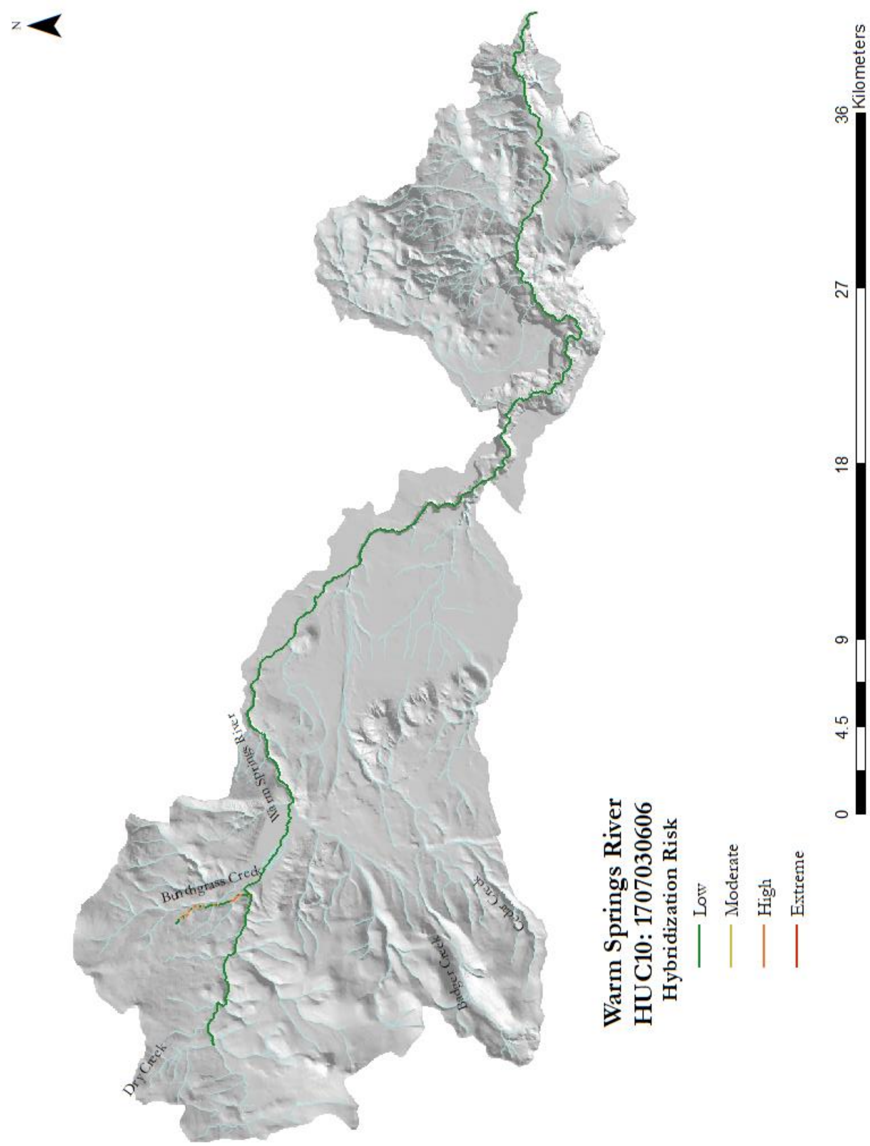

Jefferson Creek
Abbot Creek
Roaring Creek
Canyon Creek
Metolius River
Jack Creek
South Fork Lake Creek
Link Creek
N
Upper Metolius River
HUC10: 1707020301
Hybridization Risk
Low
Moderate
High
Extreme
0 2 4 8 12 16
Kilometers

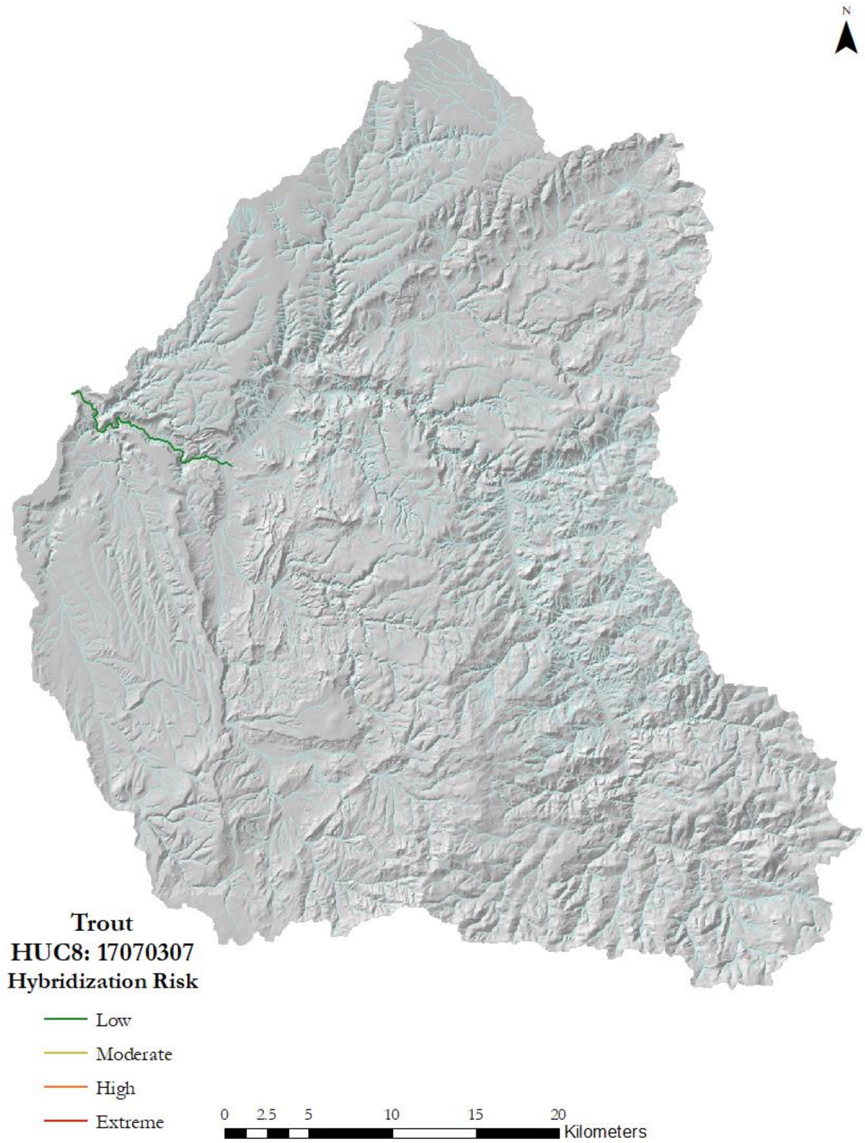

Little Deschutes
HUC8: 17070302
Hybridization Risk
Low
Moderate
High
Extreme
0
4
8
16
24
32
Kilometers
N
Long Prairie Slough
Little Deschutes River
Little Deschutes River
Crescent Creek
Johnston Creek

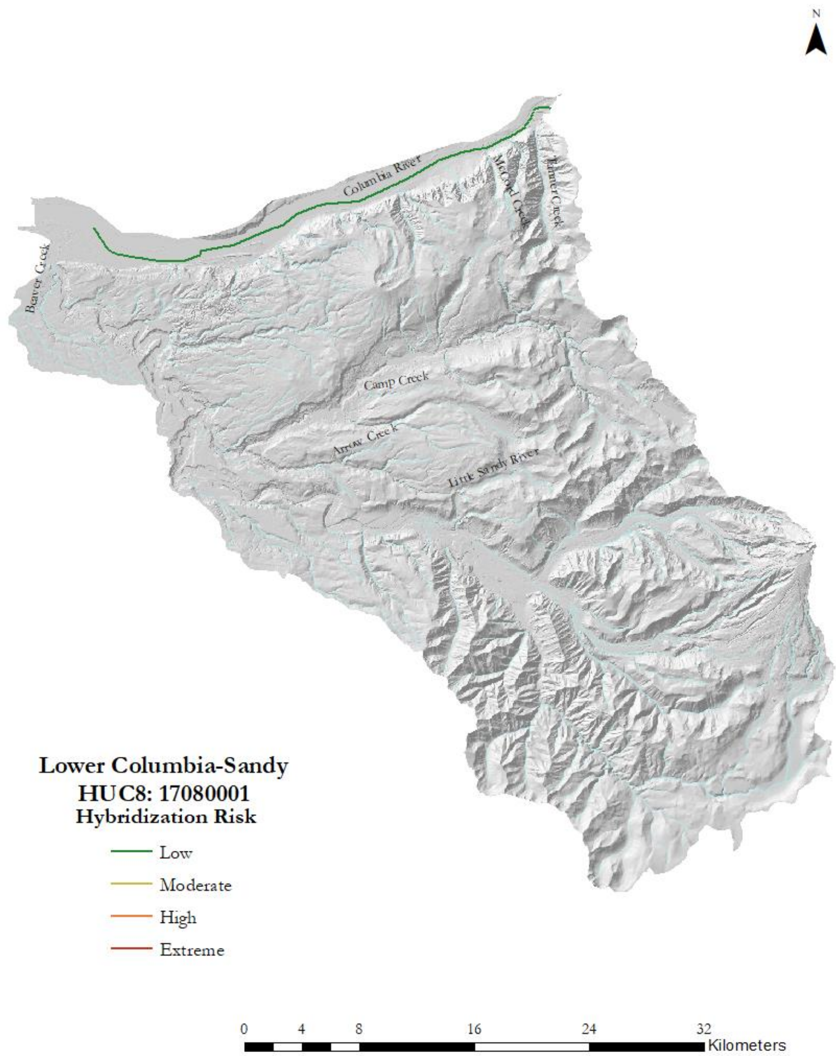


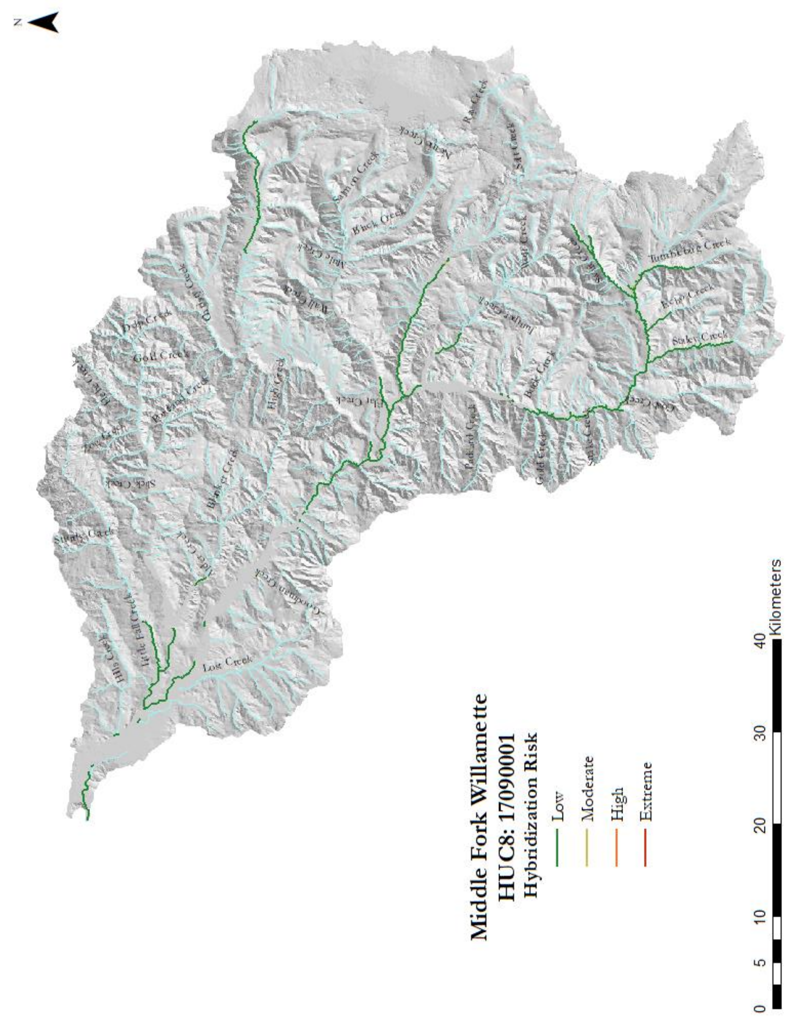
N
Dry River
McKay Creek
Lower Crooked
HUC8: 17070305
Hybridization Risk
Low
Moderate
High
Extreme
0
5
10
20
30
40
Kilometers

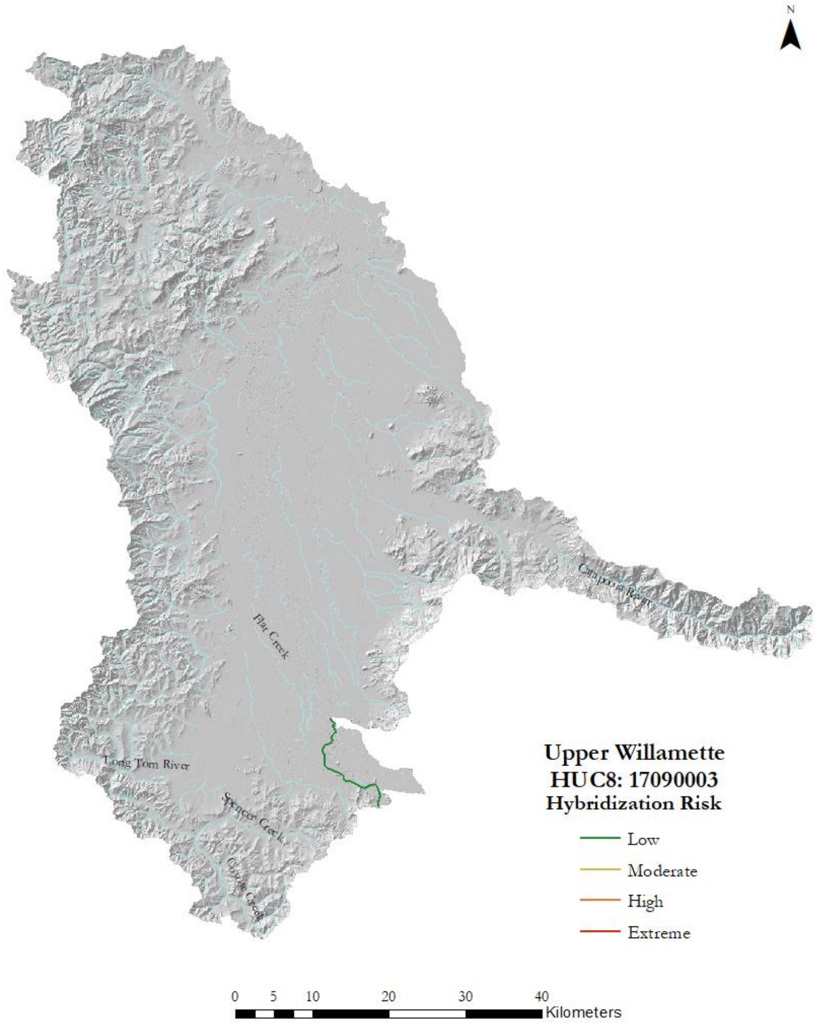

N
Lower Deschutes
HUC8: 17070306
Hybridization Risk
Low
Moderate
High
Extreme
0 5 10 20 30 40
Kilometers

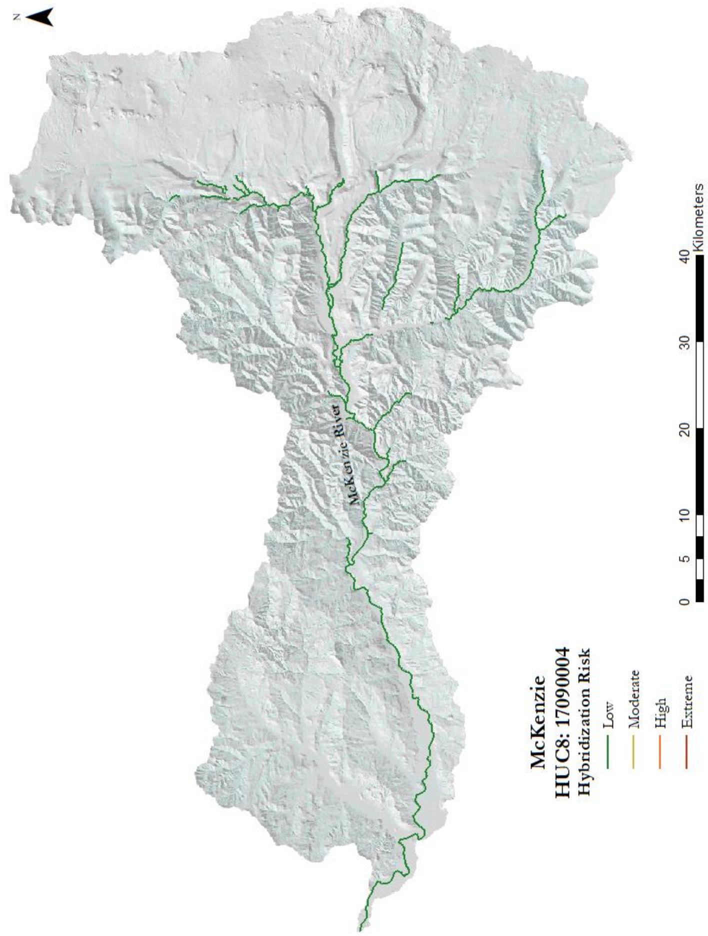

Warm Springs River
HUC10: 1707030606
Hybridization Risk
Low
Moderate
High
Extreme
0
4.5
9
18
27
36
Kilometers
Warm Springs River
Dry Creek

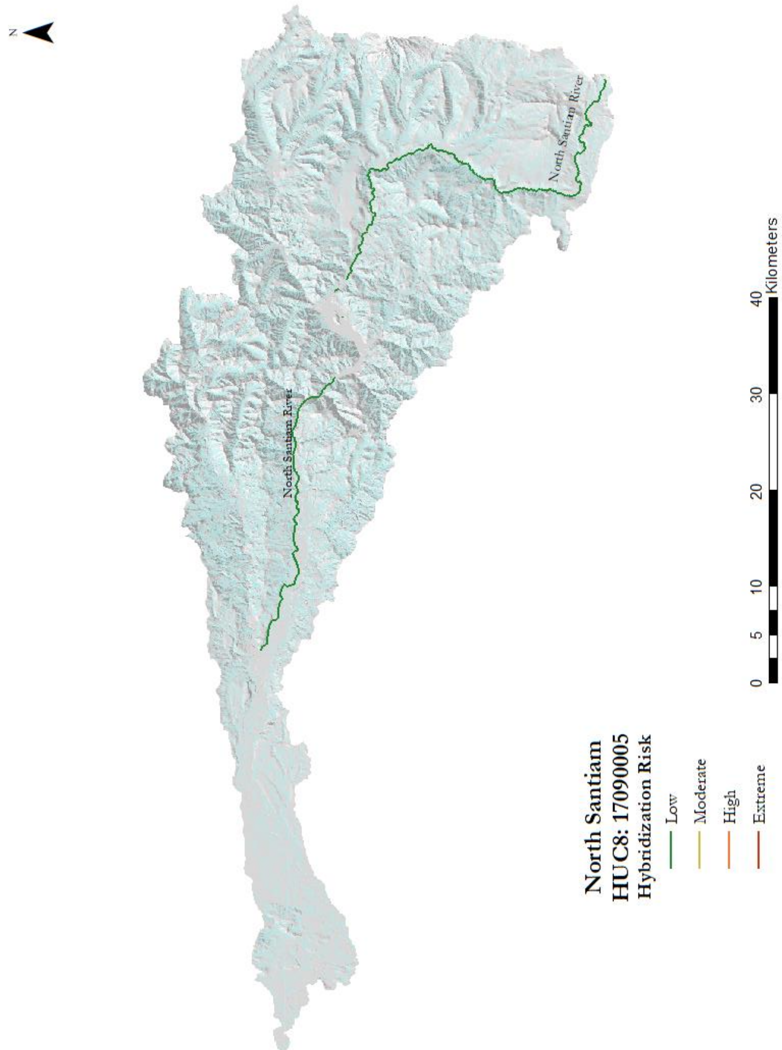

N
Trout
HUC8: 17070307
Hybridization Risk
Low
Moderate
High
Extreme
0 2.5 5 10 15 20
Kilometers

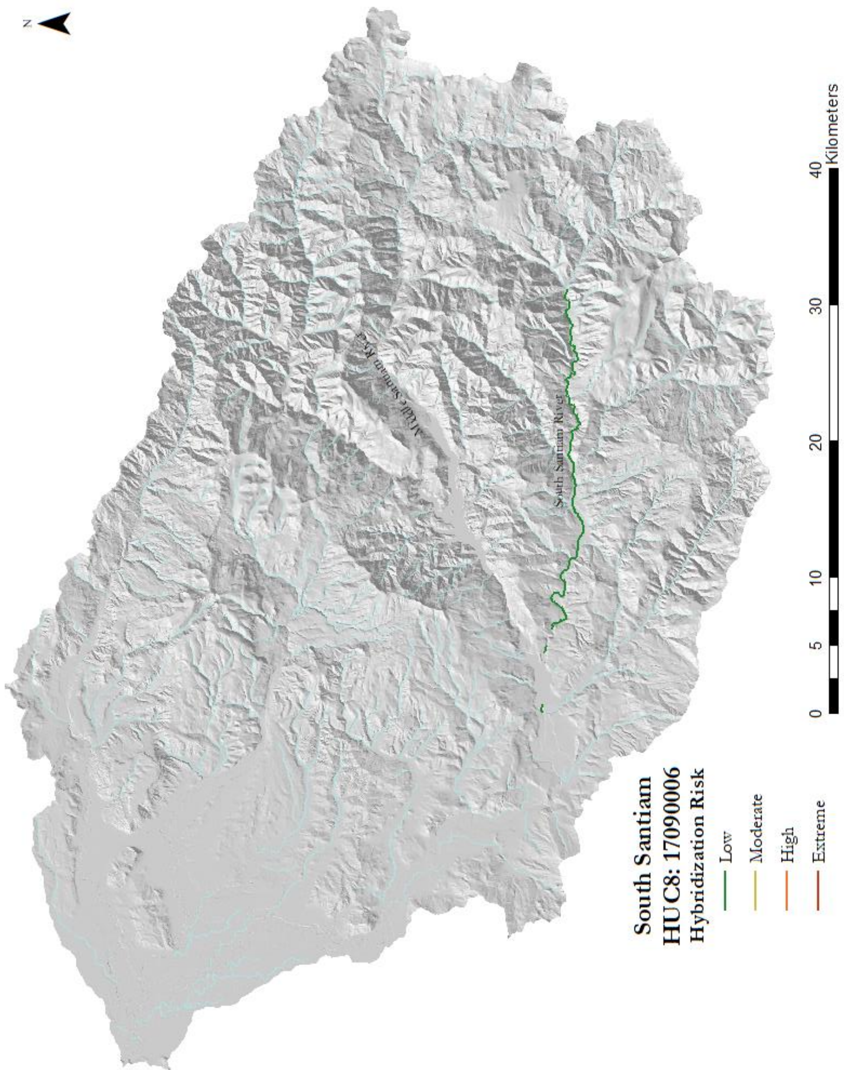

N
Columbia River
McCord Creek
Tanner Creek
Beaver Creek
Camp Creek
Arrow Creek
Little Sandy River
Lower Columbia-Sandy
HUC8: 17080001
Hybridization Risk
Low
Moderate
High
Extreme
0 4 8 16 24 32
Kilometers

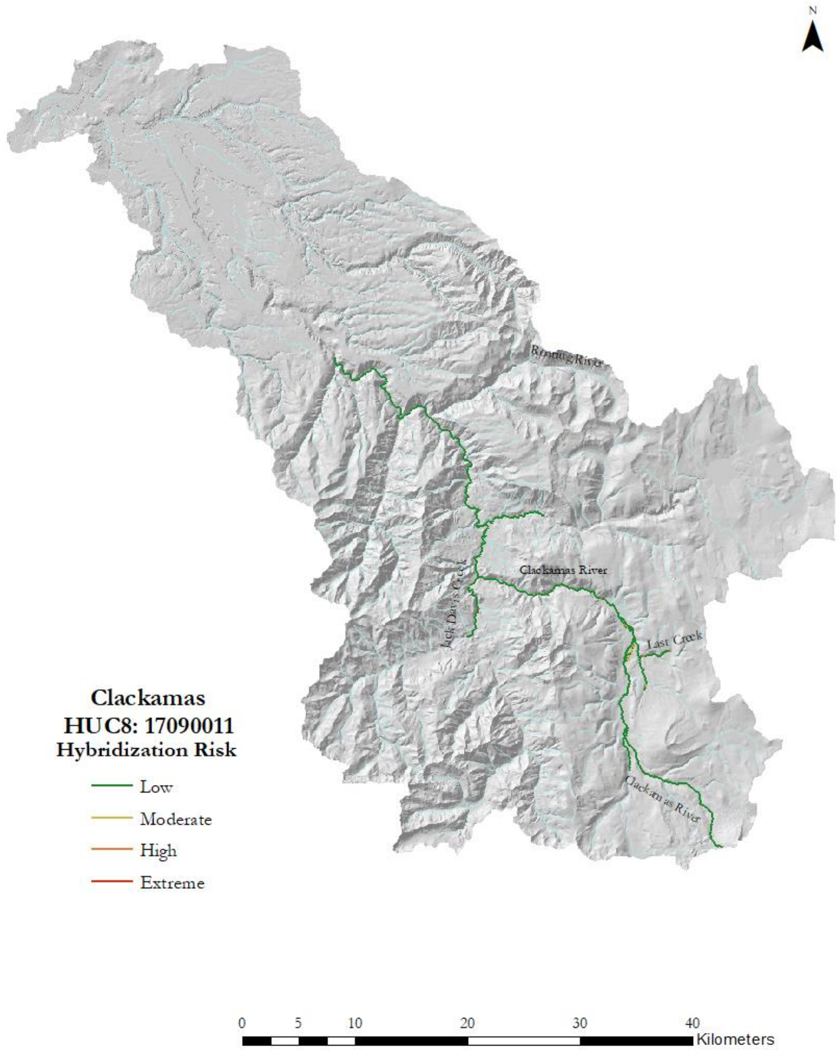

Middle Fork Willamette
HUC8: 17090001
Hybridization Risk
Low
Moderate
High
Extreme
0
5
10
20
30
40
Kilometers

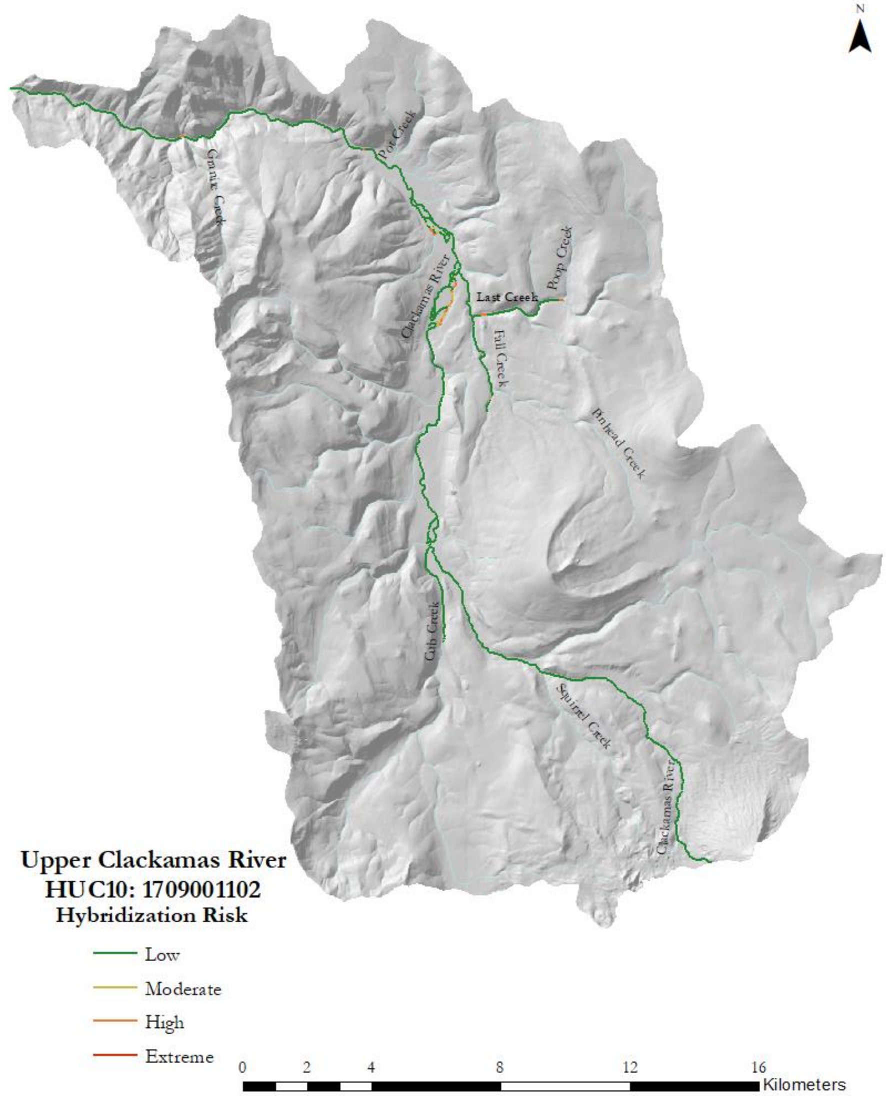

N
Flat Creek
Long Tom River
Spencer Creek
Coyote Creek
Upper Willamette
HUC8: 17090003
Hybridization Risk
Low
Moderate
High
Extreme
0 5 10 20 30 40
Kilometers

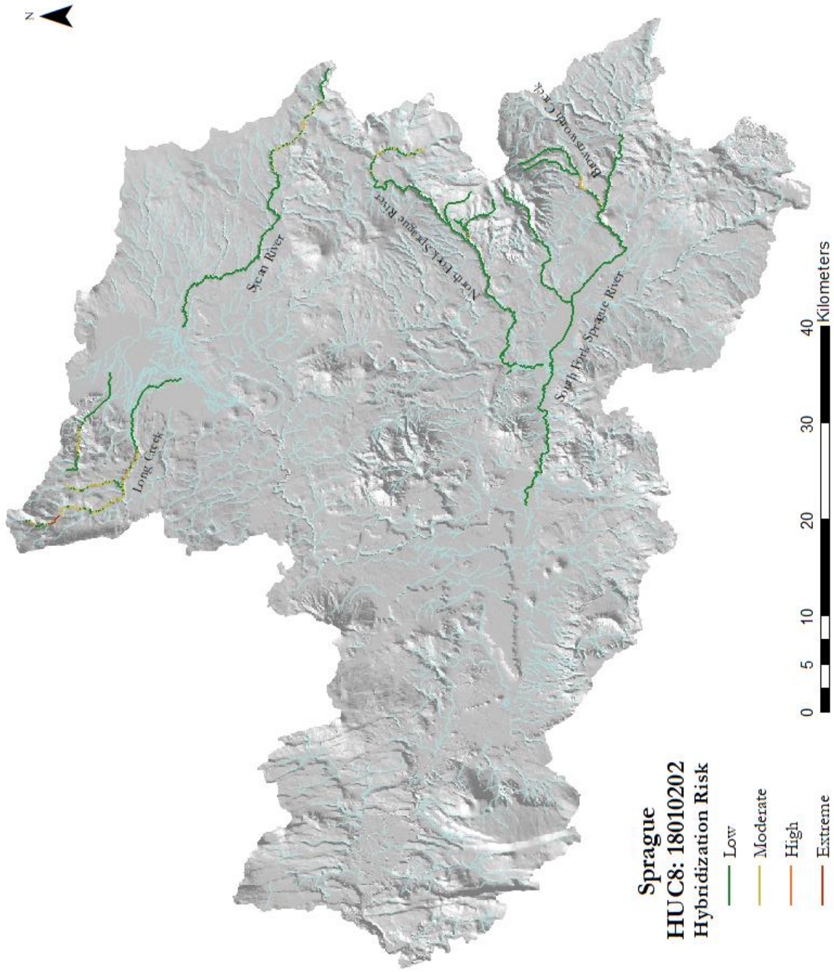

N
McKenzie River
McKenzie
HUC8: 17090004
Hybridization Risk
Low
Moderate
High
Extreme
0
5
10
20
30
40
Kilometers

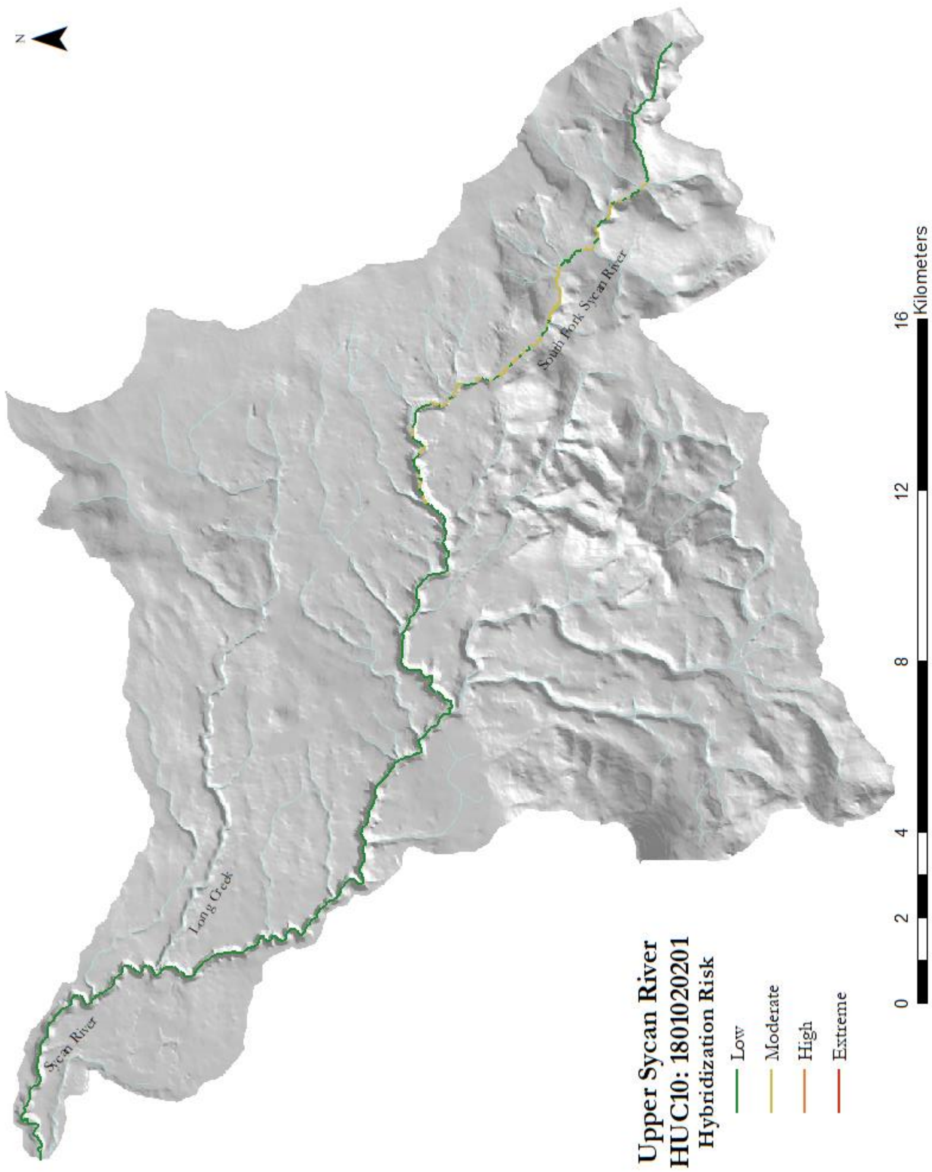

N
North Santiam River
North Santiam River
North Santiam
HUC8: 17090005
Hybridization Risk
Low
Moderate
High
Extreme
0
5
10
20
30
40
Kilometers

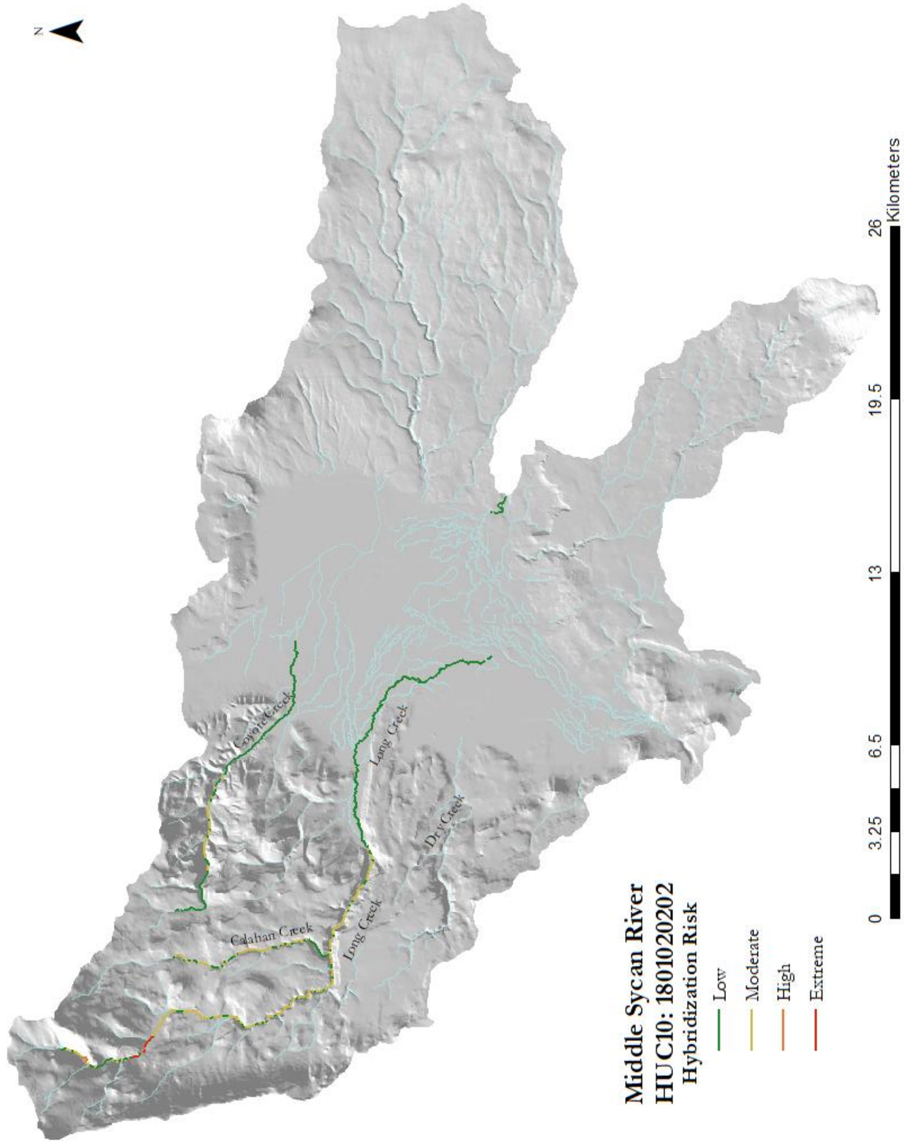

N
Middle Santiam River
South Santiam River
South Santiam
HUC8: 17090006
Hybridization Risk
Low
Moderate
High
Extreme
0
5
10
20
30
40
Kilometers

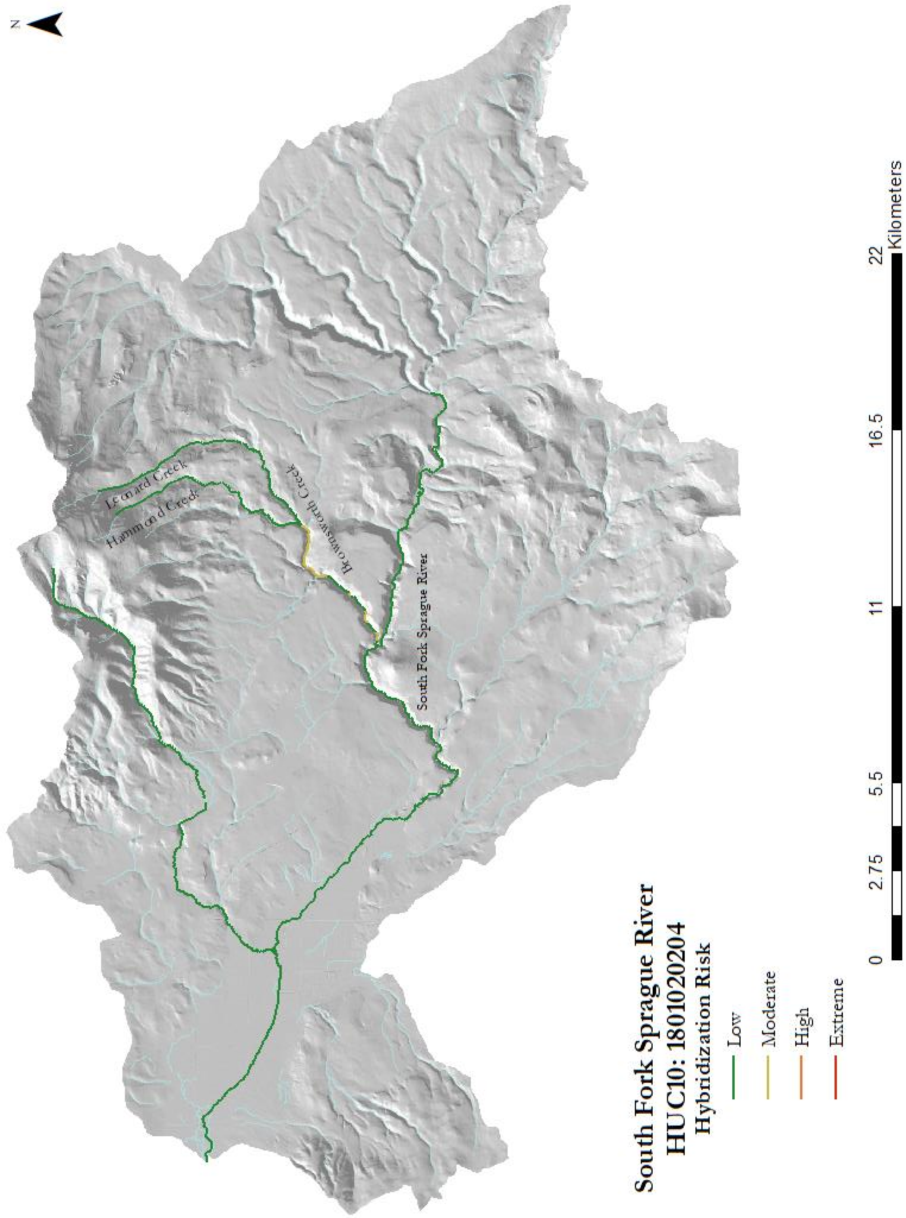

N
Roaring River
Clackamas River
Jack Davis Creek
Last Creek
Clackamas River
Clackamas
HUC8: 17090011
Hybridization Risk
Low
Moderate
High
Extreme
0
5
10
20
30
40
Kilometers

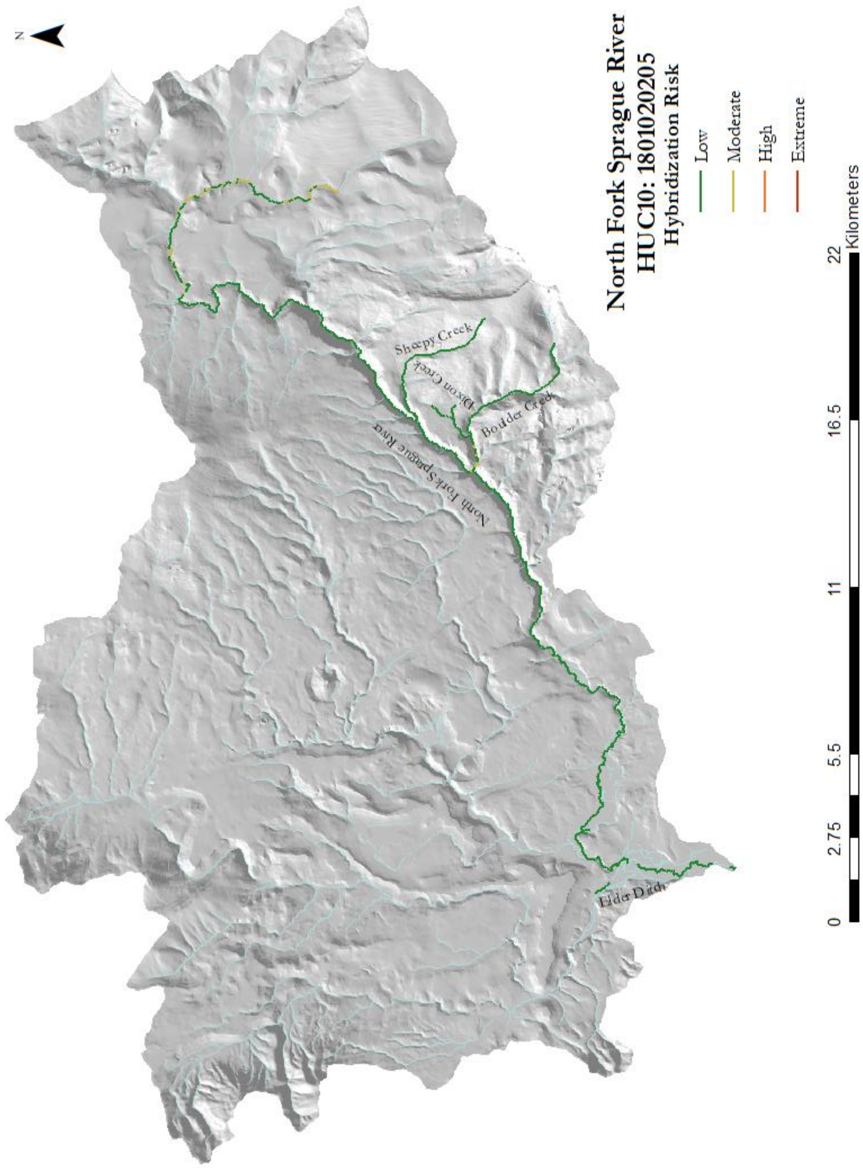

Upper Clackamas River
HUC10: 1709001102
Hybridization Risk
Low
Moderate
High
Extreme
0
2
4
8
12
16
Kilometers
Last Creek
Poop Creek
Clackamas River
Pot Creek
Granite Creek
Fall Creek
Pinhead Creek
Cub Creek
Squirrel Creek

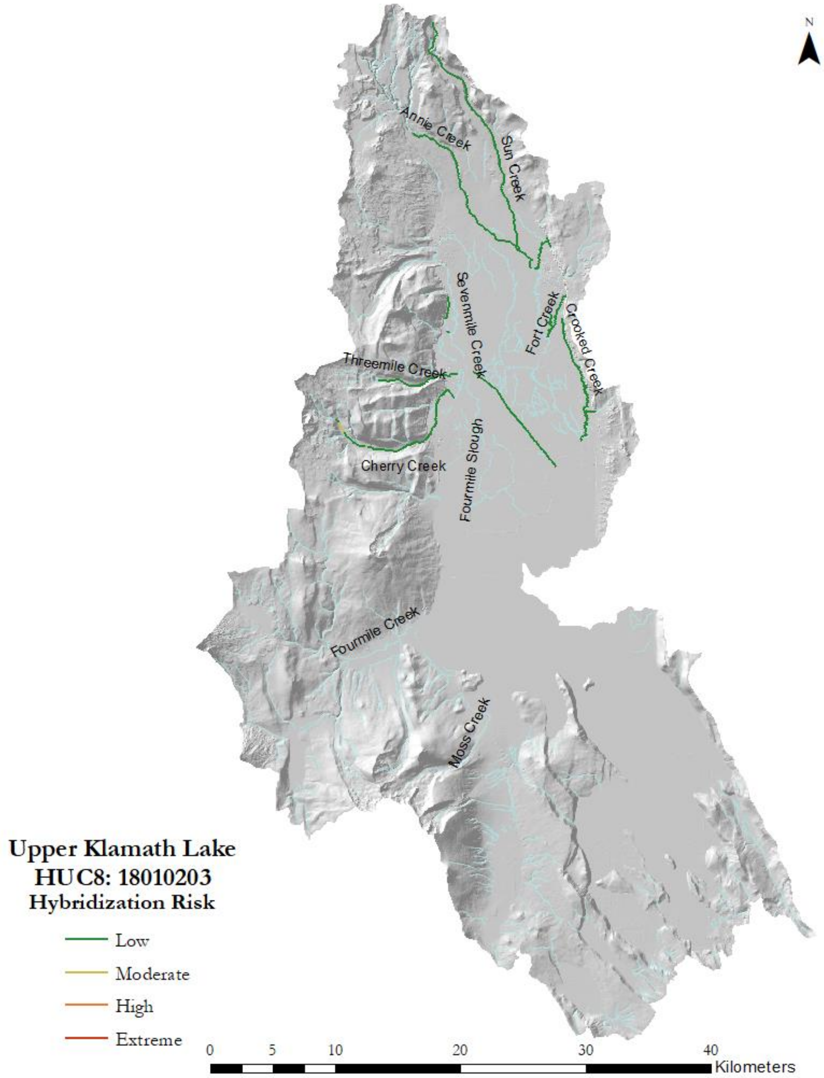

N
Sprague
HUC8: 18010202
Hybridization Risk
Low
Moderate
High
Extreme
0
5
10
20
30
40
Kilometers
Sycan River
North Fork Sprague River
South Fork Sprague River
Long Creek


Upper Sycan River
HUC10: 1801020201
Hybridization Risk
Low
Moderate
High
Extreme
0 2 4 8 12 16
Kilometers
N
South Fork Sycan River
Long Creek
Sycan River


N
Middle Sycan River
HUC10: 1801020202
Hybridization Risk
Low
Moderate
High
Extreme
Coyote Creek
Long Creek
Dry Creek
Calahan Creek
Long Creek
0
3.25
6.5
13
19.5
26
Kilometers


South Fork Sprague River
HUC10: 1801020204
Hybridization Risk
Low
Moderate
High
Extreme
0
2.75
5.5
11
16.5
22
Kilometers
Leonard Creek
Hammond Creek
Brownsworth Creek
South Fork Sprague River


N
North Fork Sprague River
HUC10: 1801020205
Hybridization Risk
Low
Moderate
High
Extreme
0
2.75
5.5
11
16.5
22
Kilometers
Sheepy Creek
Dixon Creek
Boulder Creek
North Fork Sprague River
Fiddler Ditch


N
Annie Creek
Sun Creek
Sevenmile Creek
Fort Creek
Crooked Creek
Threemile Creek
Cherry Creek
Fourmile Slough
Fourmile Creek
Moss Creek
Upper Klamath Lake
HUC8: 18010203
Hybridization Risk
Low
Moderate
High
Extreme
0
5
10
20
30
40
Kilometers