

Columbia River Instream Atlas Project

Washington Department of Fish and Wildlife

Final Report – APPENDIX F

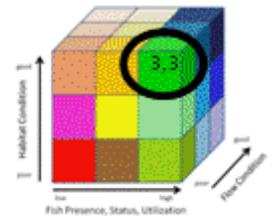
WRIA 48 METHOW

4802 - Methow River (Reach 2)

Fish	Habitat	Flow
3	3	3



Fish Status/Utilization and Habitat Condition scores use this color scheme:



Flow Condition score uses line thickness



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Columbia River Instream Atlas Project - Final Report

Appendix F –WRIA 48 Methow

September 23, 2011

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Columbia River Instream Atlas Project

Final Report

Appendix F - WRIA 48 - Methow

September 23, 2011

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1. Description

The Methow River Basin (WRIA 48) is located in Okanogan County in north central Washington. The Methow River occupies a deep valley draining the eastern slope of the north Cascade Mountains and forms an important tributary to the Columbia River. The Methow basin consists of about 1,167,764 acres. About 89% of the basin is in public ownership. The remaining 11% is privately owned and is primarily within the valley bottoms. The subbasin consists of ten primary watersheds: Early Winters Creek, Upper Methow, Lost, Middle Methow, Chewuch, Twisp, Beaver Creek, Gold

Creek, Libby Creek, and the Lower Methow Rivers. Spring Chinook, steelhead, and bull trout spawn and rear in the Methow basin¹.

2. Reach Definitions

Many of the Methow stream reaches evaluated for this project extended into Forest Service (USFS) lands where there are no possibilities for water acquisition. In these cases, the beginning of the USFS property would demarcate the upper boundary of the reach. Other stream reaches, as in other watersheds, extend upstream to a major contributor of water, where there are few to no other diversions upstream, or where habitat changes enough to start a new reach. There were only thirteen reaches evaluated for the 2002 water acquisition priorities whereas this new assessment contains thirty-five. In some streams there are very few diversions with low potential for any flow augmentation. But in review of water rights, there still remained that potential, with small volumes of water rights, to augment flows. And the potential to increase habitat with small amounts of water into a smaller system can prove beneficial in restoration and recovery efforts within the Columbia River and its tributaries.

Table F-1 Reach Definitions

Stream Name	Code	Stream Reach Description
Methow River (Reach 1)	4801	Mouth to Twisp River
Methow River (Reach 2)	4802	Twisp River to Chewuch River
Methow River (Reach 3)	4803	Chewuch River to Early Winters Creek
Squaw Creek	4804	Mouth to Squaw Creek Road crossing
French Creek	4805	Mouth to DNR boundary
Petes Creek	4806	Mouth to Highway 123
McFarland Creek	4807	Mouth to 2nd McFarland Road Crossing
Cow Creek	4808	Mouth to road crossing at 120°03'10.24", 48°11'40.18"
Libby Creek	4809	Mouth to uppermost extent of USFS boundary
Texas Creek	4810	Mouth to North Fork Texas Creek
Puckett Creek	4811	Mouth to Biggers Road
Leecher Canyon	4812	Mouth to USFS boundary
Benson Creek	4813	Mouth to USFS boundary
Alder Creek	4814	Mouth to USFS boundary
Beaver Creek (Reach 1)	4815	Mouth to Frazer Creek
Beaver Creek (Reach 2)	4816	Frazer Creek to South Fork Beaver Creek
Black Canyon Creek	4817	Mouth to USFS boundary
Booth Canyon Creek	4818	Mouth to Booth Canyon Creek forks

1 Adapted from Northwest Power and Conservation Council 2005b; Upper Columbia Salmon Recovery Board 2007

Stream Name	Code	Stream Reach Description
Frazer Creek	4819	Mouth to USFS boundary
Twisp River	4820	Mouth to Buttermilk Creek
Poorman Creek	4821	Mouth to USFS boundary
Little Bridge Creek	4822	Mouth to upper diversion
Buttermilk Creek	4823	Mouth to Buttermilk Creek forks
Thompson Creek	4824	Mouth to USFS boundary
Bear Creek	4825	Mouth to USFS boundary
Chewuch River	4826	Mouth to USGS gauge 12447600
Cub Creek	4827	Mouth to USFS boundary
Ramsey Creek	4828	Mouth to road crossing at USFS boundary
Little Boulder Creek	4829	Mouth to USFS boundary
Wolf Creek	4830	Mouth to diversion dam
Little Falls Creek	4831	Mouth to South Fork Little Falls Creek
Fawn Creek	4832	Mouth to USFS boundary
Goat Creek	4833	Mouth to Goat Cr Road (AKA FR 52)
Gold Creek	4834	Mouth to South Fork Gold Creek
Early Winters Creek	4835	Mouth to Early Winters Diversion

3. WRIA Results

Fish Status and Utilization

Components of the Fish Status / Utilization score and ranking are SaSI status, ESA status, fish diversity, and time spent in the reach for spawning/incubation, rearing/smolt migration and adult migration. TRT designation was not considered in this rating but is available on the spreadsheets for inclusion in future evaluations.

Eight stocks are found in the Methow Basin: Twisp, Methow, Lost River, and Chewuch Spring Chinook; Methow Summer Chinook; Methow Summer Steelhead; Bull Trout; and reintroduced coho. For this analysis bull trout are evaluated as one stock even though they are separated under SaSI (see Appendix A for additional information). Of the aforementioned stocks, the four spring Chinook stocks are classified as endangered under the ESA and critical by SaSI. In contrast the summer Chinook stock does not warrant listing by the ESA and is considered healthy by SaSI standards. Summer steelhead and bull trout are listed as threatened under ESA. Summer steelhead and all but one bull trout stock status are classified as unknown by SaSI. The exception to this is one healthy stock of bull trout.

An endemic coho stock was extirpated from the Methow River Basin in the early 1900's by the construction of Pateros Dam, overharvesting and irrigation practices. The federal ESA and Washington State SaSI do not recognize or address extinct or

extirpated species. The present coho stock is a reintroduced hatchery stock associated with efforts by the Yakama Nation to bring coho back to the Methow River Basin. Therefore the stock ESA or SaSI status is not available for this evaluation but an unknown status will be used in place of the SaSI rating.

The weighting factor (ESA and SaSI) for the each stock will remain the same within the basin whereas the life cycle stages and duration will change depending on the stream reach. Stock SaSi status, and ESA listing will not be repeated for each stream reach.

Table F-2 SaSI Stock Name, Status, ESA Listing Unit, & Listing Status

SaSI Stock name	SaSI Status	ESA Unit Name	ESA Listing Status		
Methow Summer Chinook	Healthy	Upper Columbia River Summer and Fall Run Chinook	Not Warranted		
Methow Spring Chinook	Critical	Upper Columbia River Spring Run Chinook	Endangered		
Twisp Spring Chinook	Critical				
Chewuch Spring Chinook	Critical				
Lost River Spring Chinook	Critical				
Methow Summer Steelhead	Unknown	Upper Columbia Steelhead	Endangered		
West Fork Methow Bull Trout/Dolly Varden	Unknown	Upper Columbia River Bull Trout	Threatened		
Gold Creek (Methow) Bull Trout/Dolly Varden	Unknown				
Beaver Ck Bull Trout/Dolly Varden	Unknown				
Twisp Bull Trout/Dolly Varden	Unknown				
West Fork Buttermilk Ck Bull Trout/Dolly Varden	Unknown				
East Fork Buttermilk Ck Bull Trout/Dolly Varden	Unknown				
Lost River Bull Trout	Healthy				
First Hidden Lake Bull Trout/Dolly Varden	Unknown				
Middle Hidden Lake Bull Trout/Dolly Varden	Unknown				
Monument Creek Bull Trout/Dolly Varden	Unknown				
Reynolds Creek Bull Trout/Dolly Varden	Unknown				
Cougar Lake Bull Trout/Dolly Varden	Unknown				
Lake Creek Bull Trout/Dolly Varden	Unknown				
Wolf Creek Bull Trout/Dolly Varden	Unknown				
Goat Creek Bull Trout	Unknown				
Early Winters Creek Bull Trout	Unknown				
Cedar Creek Bull Trout/Dolly Varden	Unknown				
Coho - SaSI stock not assigned	Unknown			n/a	n/a

Table F-3 Fish status & utilization periodicity for five life stages

Fish Species - SaSI Stock	Life Stage	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Methow Summer Chinook (ESA Not Warranted; 1 Healthy SaSI stock)	Adult In-Migration												
	Spawning												
	g Incubation & Fry Emergence												
	Rearing												
	Juvenile Out-Migration												
Methow Spring Chinook (ESA Endangered; 4 Critical SaSI stocks)	Adult In-Migration												
	Spawning												
	g Incubation & Fry Emergence												
	Rearing												
	Juvenile Out-Migration												
Methow Summer Steelhead (ESA Threatened; 1 Unknown SaSI stock)	Adult In-Migration												
	Spawning												
	g Incubation & Fry Emergence												
	Rearing												
	Juvenile Out-Migration												
Methow Coho (No ESA stock; No SaSI stock; Reintroduced)	Adult In-Migration												
	Spawning												
	g Incubation & Fry Emergence												
	Rearing												
	Juvenile Out-Migration												
Methow Bull Trout (ESA Threatened; 17 SaSI stocks of Unknown to Critical status)	Spawning												
	g Incubation & Fry Emergence												
	Rearing												
	0												

Note: Stock presence varies by stream reach

 = No Use
 = Some activity or use occurring
 = Peak activity

Table F-4 Fish status/utilization score & bin by stream reach

Reach Code	Reach Name	Prioritization Score	Normalized Score	Bin	Bin Equivalent
4801	Methow River (Reach 1)	515	0.93	3	High
4802	Methow River (Reach 2)	551	1.00	3	High
4803	Methow River (Reach 3)	455	0.83	3	High
4804	Squaw Creek	295	0.54	2	Average
4805	French Creek	295	0.54	2	Average
4806	Petes Creek	295	0.54	2	Average
4807	McFarland Creek	295	0.54	2	Average
4808	Cow Creek	295	0.54	2	Average
4809	Libby Creek	325	0.59	2	Average
4810	Texas Creek	295	0.54	2	Average
4811	Puckett Creek	295	0.54	2	Average
4812	Leecher Canyon	295	0.54	2	Average
4813	Benson Creek	295	0.54	2	Average
4814	Alder Creek	295	0.54	2	Average
4815	Beaver Creek (Reach 1)	370	0.67	3	High
4816	Beaver Creek (Reach 2)	171	0.31	1	Low
4817	Black Canyon Creek	325	0.59	2	Average
4818	Booth Canyon Creek	295	0.54	2	Average
4819	Frazer Creek	126	0.23	1	Low
4820	Twisp River	442	0.80	3	High
4821	Poorman Creek	150	0.27	1	Low
4822	Little Bridge Creek	150	0.27	1	Low
4823	Buttermilk Creek	231	0.42	2	Average
4824	Thompson Creek	247	0.45	2	Average
4825	Bear Creek	247	0.45	2	Average
4826	Chewuch River	394	0.72	3	High
4827	Cub Creek	171	0.31	1	Low
4828	Ramsey Creek	144	0.26	1	Low
4829	Little Boulder Creek	229	0.42	2	Average
4830	Wolf Creek	337	0.61	2	Average
4831	Little Falls Creek	229	0.42	2	Average
4832	Fawn Creek	229	0.42	2	Average
4833	Goat Creek	250	0.45	2	Average
4834	Gold Creek	406	0.74	3	High
4835	Early Winters Creek	337	0.61	2	Average

Habitat Condition

Overall the Methow subbasin is a considerably healthy system. Many of its tributaries extend into Forest Service boundaries and for the most part the basin hasn't been inundated with sprawl and urban development. Creeks in the lower part of the Methow River system tend to have less water and in many cases be intermittent throughout the year, especially south-facing creeks downstream of the Chewuch River confluence. Habitat is exceptional in the upper extents of many of the creeks that are on USFS property and the focus of water acquisition may be on passage and the amount of water needed to aid fish to migrate upstream into their natal spawning grounds. That should not exclude the need for juvenile rearing needs in the small streams that do not naturally go dry during low flow periods.

The mainstem Methow River dries up in portions of the upper reach between Robinson Creek (RM 74.6) and the Weeman Bridge (RM 59.7) and this phenomenon has been documented as far back as 1898 (Gorman 1899). Therefore it is unlikely that there is enough water for acquisition to “water-up” that section of the Methow.

Color / Bin Score

3 = High/Good

2 = Average / Fair

1 = Low / Poor

Table F-5 Habitat condition score & bin by stream reach

Reach Code	Reach Name	Prioritization Score	Bin
4801	Methow River (Reach 1)	15	3
4802	Methow River (Reach 2)	14	2
4803	Methow River (Reach 3)	19	3
4804	Squaw Creek	6	1
4805	French Creek	6	1
4806	Petes Creek	6	1
4807	McFarland Creek	6	1
4808	Cow Creek	6	1
4809	Libby Creek	13	2
4810	Texas Creek	6	1
4811	Puckett Creek	6	1
4812	Leecher Canyon	6	1
4813	Benson Creek	6	1
4814	Alder Creek	6	1
4815	Beaver Creek (Reach 1)	11	2
4816	Beaver Creek (Reach 2)	14	2
4817	Black Canyon Creek	8	1
4818	Booth Canyon Creek	6	1
4819	Frazer Creek	11	2
4820	Twisp River	15	3

Reach Code	Reach Name	Prioritization Score	Bin
4821	Poorman Creek	13	1
4822	Little Bridge Creek	15	3
4823	Buttermilk Creek	15	3
4824	Thompson Creek	6	1
4825	Bear Creek	8	1
4826	Chewuch River	18	3
4827	Cub Creek	13	2
4828	Ramsey Creek	6	1
4829	Little Boulder Creek	10	2
4830	Wolf Creek	16	3
4831	Little Falls Creek	6	1
4832	Fawn Creek	6	1
4833	Goat Creek	11	2
4834	Gold Creek	13	2
4835	Early Winters Creek	13	2

Flow Condition

Water supply has been paramount to this basin since European settlement began in the late 1800s. Since the late 1980s, the Methow Basin has been involved in a variety of water planning efforts and studies. In addition to planning efforts and technical studies, the basin has also been at the center of several controversial projects, court decisions, and enforcement actions related to Endangered Species Act and state water resources. These have created an intense awareness of water-related issues in the basin.

In 1976, Ecology adopted chapter 173-548 Washington Administrative Code (WAC), which establishes instream flows for seven sub-basins: the Lower Methow, Middle Methow, Upper Methow, Methow Headwaters, Early Winters Creek, Chewuch River and Twisp River. The Rule designates control station locations near the lowest point of each sub-basin to be used for monitoring flows. Streamflow gages operated by the United States Geological Survey (USGS) and having various periods of record are present at or near these locations. All water rights established after the December 28, 1976 rule implementation are subject to flows established in the Rule, except that a reservation of surface water for single domestic and stock watering uses equal to 2 cubic feet per second (cfs) was set aside in each of the seven Methow River reaches to meet future needs. Rights to groundwater developed after 1976 are subject to the instream flow rule if it is determined that groundwater withdrawals will affect surface waters.

Several salmon recovery efforts are worth noting because they depend in part on water use management actions. The Upper Columbia Spring Chinook Salmon and Steelhead Recovery Plan was completed by the Upper Columbia Salmon Recovery Board (UCSRB) in August 2007. The recovery plan also addresses bull trout and contains over 300 recommended recovery actions for harvest, hatchery, hydropower, and habitat sectors that affect populations of these fish in the Upper Columbia Basin. Salmonid populations in the Methow River are an integral part of this recovery plan.

Also, United States Bureau of Reclamation and Bonneville Power Administration are actively engaged in WRIA 48 providing funding and technical support for restoration actions involving fish screening, passage barrier removal, habitat and riparian area restoration, and stream flow restoration.²

In 2009, the UCSRB’s Regional Technical Team published a list of priorities for implementing habitat actions in Upper Columbia River subbasins. Stream flow enhancement is identified as a priority for the lower Twisp, lower Chewuch, and Beaver Creek reaches.³

Only nine of thirty-five reaches evaluated for this project had appropriate gauge data. Five of the seven instream flow rules are associated with reaches analyzed (Table F-6). Two gauged control points occur in the mainstem upstream from the reaches we analyzed.

Table F-6 Minimum Instream Flow set in Chapter 173-548 WAC

		Reach 4801 Lower Methow Nr Pateros 12449950	Reach 4802 Middle Methow Nr Twisp 12449500	Reach 4820 Twisp R 12447500	Reach 4826 Chewuch R 12448998	Reach 4835 Early Winters Ck
Jan	1	350	260	34	56	10
	15	350	260	34	56	10
Feb	1	350	260	34	56	10
	15	350	260	34	56	10
Mar	1	350	260	34	56	10
	15	350	260	34	56	10
Apr	1	590	430	60	90	14
	15	860	650	100	140	23
May	1	1,300	1,000	170	215	32
	15	1,940	1,500	300	290	108
Jun	1	2,220	1,500	440	320	290
	15	2,220	1,500	440	320	290
Jul	1	2,150	1,500	390	292	125

² Adapted from Methow Basin (WRIA 48) Watershed Plan, Methow Basin Planning Unit, 2005; and Final Detailed Implementation Plan - Methow River Basin (WRIA 48), Methow Watershed Council, 2009.

³ RTT, 13 March 2009.

		Reach 4801 Lower Methow Nr Pateros	Reach 4802 Middle Methow Nr Twisp	Reach 4820 Twisp R	Reach 4826 Chewuch R	Reach 4835 Early Winters Ck
	15	800	500	130	110	45
Aug	1	480	325	58	70	20
	15	300	220	27	47	8
Sep	1	300	220	27	47	8
	15	300	220	27	47	8
Oct	1	360	260	35	56	11
	15	425	320	45	68	15
Nov	1	425	320	45	68	15
	15	425	320	45	68	15
Dec	1	390	290	39	62	12
	15	350	260	34	56	10

Note: Rules for two reaches not evaluated for this project are not included on this table.

Table F-7 Flow condition score & bin by stream reach

Reach Code	Reach Name	Prioritization Score	Bin
4801	Methow River (Reach 1)	4	3
4802	Methow River (Reach 2)	4	3
4803	Methow River (Reach 3)	3	3
4804	Squaw Creek	28	1
4805	French Creek	32	1
4806	Petes Creek	20	2
4807	McFarland Creek	24	1
4808	Cow Creek	20	2
4809	Libby Creek	21	1
4810	Texas Creek	16	2
4811	Puckett Creek	16	2
4812	Leecher Canyon	28	1
4813	Benson Creek	16	2
4814	Alder Creek	28	1
4815	Beaver Creek (Reach 1)	18	2
4816	Beaver Creek (Reach 2)	21	1
4817	Black Canyon Creek	18	2
4818	Booth Canyon Creek	20	2
4819	Frazer Creek	24	1

Color / Bin Score

3 = High/Good
2 = Average / Fair
1 = Low / Poor

Reach Code	Reach Name	Prioritization Score	Bin
4820	Twisp River	10	3
4821	Poorman Creek	28	1
4822	Little Bridge Creek	18	2
4823	Buttermilk Creek	15	3
4824	Thompson Creek	32	1
4825	Bear Creek	28	1
4826	Chewuch River	8	3
4827	Cub Creek	12	3
4828	Ramsey Creek	16	2
4829	Little Boulder Creek	20	2
4830	Wolf Creek	21	1
4831	Little Falls Creek	12	3
4832	Fawn Creek	28	1
4833	Goat Creek	9	3
4834	Gold Creek	16	2
4835	Early Winters Creek	7	3

4. Reach Results

4801 - Methow River (Reach 1)

Fish	Habitat	Flow
3	3	3

Fish Status/Utilization

The four spring Chinook stocks and fluvial bull trout do not spawn in Methow River (Reach 1) but do utilize the reach for juvenile rearing and migration as well as adult migration life cycle stages. In contrast summer Chinook, coho, and summer steelhead utilize the reach for spawning, juvenile rearing and migration and adult migration life cycle stages. All eight stocks are found in Methow River (Reach 1) at some point in their life cycle, so this reach has a high Fish Status / Utilization score.

Fish Status/Utilization scoring detail is available on Table F-8.

Habitat

The lower Methow River is documented as having minimal amounts of off-channel rearing and is mainly a migration corridor for up-and-downstream migrating salmonids. The Limiting Factors Analysis (LFA) rated the lower reach as having good passage and having data gaps for floodplain connectivity and riparian conditions. As this reach is mostly used as a migration corridor for migrating fish, it was given a 'fair' to 'good' score for most habitat attributes, but achieved a 'good' overall habitat score in spite of documented conditions of degraded floodplain and riparian areas due to roads and agriculture.

Habitat scoring detail is available on Table F-9.

Flow

Gauge:Yes Rule:Yes Comments: The minimum of monthly mean flows in this reach is 375 cfs in September and the peak is 5,340 cfs in June . Minimum flow is 24 percent of the average; reaches with August flows less than 33% of average scored 'poor' for this component of the flow element score. Diversions evaluated for this project represent 6 percent of the Mean Annual Flow; reaches with diversions between 5% and 15% of Mean Annual Flow scored 'poor' for this scoring component. The instream flow rule is higher than Mean Annual Flow in 1 month of the year, on average.

Flow scoring detail is available on Table F-10.

4802 - Methow River (Reach 2)

Fish	Habitat	Flow
3	2	3

Fish Status/Utilization

Methow River (Reach 2) also has a 'high' Fish Status / Utilization score. Like Methow River (Reach 1) all eight stocks utilize this reach at some point in their life cycle but some stocks have increased the time and life cycle use in Methow River (Reach2). Methow Spring Chinook utilize this reach for all three life cycle categories where as the other three spring Chinook stocks and bull trout are limited to juvenile rearing and migration and adult migration life cycle stages. Summer Chinook, coho, and summer steelhead also utilize the reach for spawning, juvenile rearing and migration and adult migration life cycle stages.

Fish Status/Utilization scoring detail is available on Table F-8.

Habitat

Habitat conditions within reach two are similar to reach 4801 as it used by salmonids primarily as a migration corridor to access upstream reaches and tributaries. The LFA rated the floodplain connectivity and riparian conditions as 'poor,' which created an overall habitat score lower than that of reach 4801. But it was still rated good enough to make the upper tier score as conditions for spawning, rearing, and passage combined were better than average.

Habitat scoring detail is available on Table F-9.

Flow

Gauge:Yes Rule:Yes Comments: The minimum of monthly mean flows in this reach is 297 cfs in September and the peak is 5,087 cfs in June . Minimum flow is 21 percent of the average; reaches with August flows less than 33% of average scored 'poor' for this component of the flow element score. Diversions evaluated for this project represent 14 percent of the Mean Annual Flow; reaches with diversions between 5% and 15% of Mean Annual Flow scored 'fair' for this scoring component. Average flows are not less than the instream flow rule in any month.

Flow scoring detail is available on Table F-10.

4803 - Methow River (Reach 3)

Fish	Habitat	Flow
3	3	3

Fish Status/Utilization

Methow River (Reach 3) also scores 'high' for Fish Status / Utilization. Where all eight stocks utilize Methow River reaches 4801 and 4802, Twisp Spring Chinook do not use this reach and Chewuch Spring Chinook use is limited to juvenile rearing. Methow Spring Chinook, Methow Summer Chinook, summer steelhead and coho continue to utilize this reach for all three life cycle categories. In addition bull trout and Lost River Spring Chinook continue to rear and migrate (juvenile and adult) in this reach.

Fish Status/Utilization scoring detail is available on Table F-8.

Habitat

Among the three Methow River reaches, reach 4803 scored the highest for habitat condition. Much of it is still considered a good migration corridor for migrating fish, and LFA scores and local biologists also ranked spawning and rearing conditions as good and all other habitat attributes as fair. This reach is the farthest upstream of the three reaches and is known for its numerous salmonid spawning areas (Denny Snyder, Bioanalysts, personal communication).

Habitat scoring detail is available on Table F-9.

Flow

Gauge:Yes Rule:No Comments: The minimum of monthly mean flows in this reach is 257 cfs in September and the peak is 4,377 cfs in May. Minimum flow is 21 percent of the average. Diversions evaluated for this project represent 3 percent of the Mean Annual Flow.

Flow scoring detail is available on Table F-10.

4804 - Squaw Creek

Fish	Habitat	Flow
2	1	1

Fish Status/Utilization

Squaw Creek is scored as 'average' for Fish Status / Utilization. All eight stocks utilize this reach for rearing and juvenile movement. Adult migration and spawning life cycle stages do not occur in Squaw Creek.

Fish Status/Utilization scoring detail is available on Table F-8.

Habitat

Habitat conditions in Squaw Creek were rated 'poor' by the two fish biologists interviewed for this project. The biggest issue is the lack of flow throughout the low flow period causing lack of riparian growth and sinuosity of the stream; it is highly channelized through the lower reach. Substrate was considered poor for spawning and lack of pools yielded 'poor' rearing scores.

Habitat scoring detail is available on Table F-9.

Flow

Gauge:No Rule:No Comments: An NHD+ estimated 2 cfs Mean Annual Flow was used to score this reach. Diversions evaluated for this project represent 27 percent of the Mean Annual Flow; reaches with diversions more than 15% of Mean Annual Flow scored 'poor' for this scoring component.

Flow scoring detail is available on Table F-10.

4805 - French Creek

Fish	Habitat	Flow
2	1	1

Fish Status/Utilization

The Fish Status / Utilization and score in French Creek are the same as for Squaw Creek. All eight stocks use the reach for juvenile rearing and movement throughout the year.

Fish Status/Utilization scoring detail is available on Table F-8.

Habitat

French Creek was not assessed in the 2000 LFA but in speaking with local biologists, it is much the same as Squaw Creek in size and condition. It is a low elevation, south facing stream and is so small in size and capacity that access and spawning and rearing conditions are mostly non-existent.

Habitat scoring detail is available on Table F-9.

Flow

Gauge:No Rule:No Comments: An NHD+ estimated 4 cfs Mean Annual Flow was used to score this reach. Diversions evaluated for this project represent 17 percent of the Mean Annual Flow; reaches with diversions more than 15% of Mean Annual Flow scored 'poor' for this scoring component.

Flow scoring detail is available on Table F-10.

4806 - Petes Creek

Fish	Habitat	Flow
2	1	2

Fish Status/Utilization

Petes Creek is a primary tributary to the Methow River mainstem and all eight stocks utilize this reach for juvenile rearing. The 'average' score reflects the lack of spawning and adult migration in the reach.

Fish Status/Utilization scoring detail is available on Table F-8.

Habitat

Petes, or Pete Creek (as stated in the LFA report) documents spring Chinook rearing in the lower reaches but was still collectively rated as 'poor' for all habitat parameters evaluated. It is again a small system with limited data found for documentation of habitat conditions.

Habitat scoring detail is available on Table F-9.

Flow

Gauge:No Rule:No Comments: An NHD+ estimated 0.3 cfs Mean Annual Flow was used to score this reach. No diversion data are available in this reach. Although there are water right claims in this reach, lack of diversion in the records examined boosted this reach's score to 'fair.'

Flow scoring detail is available on Table F-10.

4807 - McFarland Creek

Fish	Habitat	Flow
2	1	1

Fish Status/Utilization

Like other primary tributaries to the Methow River mainstem, McFarland Creek is only utilized for juvenile rearing. Spawning and adult migration typically occur in the mainstem of the Methow River. All eight stocks rear in this reach.

Fish Status/Utilization scoring detail is available on Table F-8.

Habitat

As with other of the small, low flowing streams that flow into the Methow Valley floor, McFarland Creek was not evaluated in the 2000 LFA. It was discussed among local biologists that the stream scores 'low' in all six habitat categories. Size, lack of

flow, and poor overall conditions within the lower Methow floodplain ranked it 'low' for habitat condition.

Habitat scoring detail is available on Table F-9.

Flow

Gauge:No Rule:No Comments: An NHD+ estimated 2 cfs Mean Annual Flow was used to score this reach. Diversion data used for this evaluation exceed the Mean Annual Flow, tipping this reach over into the 'poor' scoring bin.

Flow scoring detail is available on Table F-10.

4808 - Cow Creek

Fish	Habitat	Flow
2	1	2

Fish Status/Utilization

Cow Creek is another primary tributary to the mainstem Methow River. All eight stocks, except Methow Summer Chinook, rear year round in this reach. Summer Chinook rear seven months of the year in Cow Creek.

Fish Status/Utilization scoring detail is available on Table F-8.

Habitat

Cow Creek is not mentioned in the LFA and was given 'low' scores for all habitat categories. It is small, far downstream in the Methow Valley, high gradient, channelized, larger substrate, and lacks pool habitat.

Habitat scoring detail is available on Table F-9.

Flow

Gauge:No Rule:No Comments: An NHD+ estimated 1.4 cfs Mean Annual Flow was used to score this reach. No diversion data are available in this reach.

Flow scoring detail is available on Table F-10.

4809 - Libby Creek

Fish	Habitat	Flow
2	2	1

Fish Status/Utilization

Although Libby Creek is a primary tributary to the mainstem Methow River, only seven stocks limit the use of this reach to juvenile rearing. The exception is Methow Summer Steelhead, which utilize the reach for spawning, juvenile migration and rearing, and adult rearing. Even with this increase of fish use, Libby Creek fish utilization is considered 'average.'

Fish Status/Utilization scoring detail is available on Table F-8.

Habitat

From reviews of the LFA and the Upper Columbia Recovery Plan, Libby Creek contains 'fair' portions of spawning and rearing, along with 'fair' to 'poor' riparian conditions. Low efforts of habitat restoration in the creek and poor visual conditions of riparian growth due to cattle intrusion rate this reach as 'fair' overall. Forest Service biologists suggest that conditions are better than past reviews and off-channel habitat and floodplain connectivity are 'fair.'

Habitat scoring detail is available on Table F-9.

Flow

Gauge:No Rule:No Comments: An NHD+ estimated 18 cfs Mean Annual Flow was used to score this reach. Diversions evaluated for this project represent 83 percent of the Mean Annual Flow; reaches with diversions more than 15% of Mean Annual Flow scored 'poor' for this scoring component.

Flow scoring detail is available on Table F-10.

4810 - Texas Creek

Fish	Habitat	Flow
2	1	2

Fish Status/Utilization

Like Petes, Cow, French and McFarland Creeks, Texas Creek supports juvenile rearing for all eight stocks. The life cycle stages of spawning and adult migration do not occur in this reach.

Fish Status/Utilization scoring detail is available on Table F-8.

Habitat

This creek is similar to other creeks on the north-slope of the lower reach of the Methow Valley floor having poor conditions due to slope, channelization, larger substrate, low pool frequency, and poor riparian growth.

Habitat scoring detail is available on Table F-9.

Flow

Gauge:No Rule:No Comments: An NHD+ estimated 1.2 cfs Mean Annual Flow was used to score this reach. Some claims, but no diversion data, boost this reach's score to 'fair.'

Flow scoring detail is available on Table F-10.

4811 - Puckett Creek

Fish	Habitat	Flow
2	1	2

Fish Status/Utilization

Fish Status / Utilization for Puckett Creek is 'average.' Only juvenile rearing by all eight stocks occurs here. Spawning and adult migration occurs in the mainstem, but juveniles move into Puckett Creek to forage.

Fish Status/Utilization scoring detail is available on Table F-8.

Habitat

Puckett Creek is a very small creek with a short reach, and receiving no review within the LFA. Upon speaking with other fish biologists in the area, it was concluded that the overall habitat conditions were rated 'poor.'

Habitat scoring detail is available on Table F-9.

Flow

Gauge:No Rule:No Comments: An NHD+ estimated 0.2 cfs Mean Annual Flow was used to score this reach. No diversion data are available in this reach.

Flow scoring detail is available on Table F-10.

4812 - Leecher Canyon

Fish	Habitat	Flow
2	1	1

Fish Status/Utilization

Fish Status / Utilization in Leecher Creek is ‘average.’ All eight stocks, except Methow Summer Chinook, rear year round in this reach. Summer Chinook rear seven months of the year in Leecher Creek. Spawning and adult migration do not occur in this reach.

Fish Status/Utilization scoring detail is available on Table F-8.

Habitat

Leecher Canyon Creek represents another small system not mentioned in the LFA and was considered poor habitat conditions due to conditions similar to other low lying streams within the Methow watershed.

Habitat scoring detail is available on Table F-9.

Flow

Gauge:No Rule:No Comments: An NHD+ estimated 0.2 cfs Mean Annual Flow was used to score this reach. Diversions evaluated for this project represent 29 percent of the Mean Annual Flow; reaches with diversions more than 15% of Mean Annual Flow scored ‘poor’ for this scoring component.

Flow scoring detail is available on Table F-10.

4813 - Benson Creek

Fish	Habitat	Flow
2	1	2

Fish Status/Utilization

Benson Creek also rates ‘average’ for Fish Status / Utilization and is limited to juvenile rearing by all eight stocks.

Fish Status/Utilization scoring detail is available on Table F-8.

Habitat

With lower elevation and flow, Benson Creek ranked as poor habitat conditions for all six parameters. Benson Creek is mentioned and reviewed in the 2000 LFA but has indications of “data gaps” for all habitat conditions reviewed. Local fish biologists suggest that it is in poor condition for all evaluated habitat parameters.

Habitat scoring detail is available on Table F-9.

Flow

Gauge:No Rule:No Comments: An NHD+ estimated 4 cfs Mean Annual Flow was used to score this reach. Diversions evaluated for this project represent 2 percent of the Mean Annual Flow; reaches with diversions less than 5% of MAF rated 'good' for this attribute.

Flow scoring detail is available on Table F-10.

4814 - Alder Creek

Fish	Habitat	Flow
2	1	1

Fish Status/Utilization

Fish Status / Utilization for Alder Creek is the same as for the majority of other primary tributaries to the Methow River mainstem. All eight stocks utilize this reach for only juvenile rearing.

Fish Status/Utilization scoring detail is available on Table F-8.

Habitat

Alder Creek was assessed in the LFA and indicates poor conditions for five of the six habitat parameters; LFA notes a data gap for rearing, or pool content. It was concluded with area fish biologists that Alder Creek is degraded and in poor overall habitat condition.

Habitat scoring detail is available on Table F-9.

Flow

Gauge:No Rule:No Comments: An NHD+ estimated 0.9 cfs Mean Annual Flow was used to score this reach. Diversions evaluated for this project represent 43 percent of the Mean Annual Flow; reaches with diversions more than 15% of Mean Annual Flow scored 'poor' for this scoring component.

Flow scoring detail is available on Table F-10.

4815 - Beaver Creek (Reach 1)

Fish	Habitat	Flow
3	2	2

Fish Status/Utilization

Beaver Creek (Reach 1) rates 'high' for Fish Status / Utilization. Like other primary tributaries, the four stocks of spring Chinook and one summer Chinook stock only utilized this reach for juvenile rearing. The other three stocks utilize Beaver Creek (Reach 1) for other life cycle stages. Coho and Methow Summer Steelhead utilize the reach for all three life cycle stages where as adult bull trout are known to migrate through this reach but do not spawn here. Juvenile bull trout will move into this reach to forage.

Fish Status/Utilization scoring detail is available on Table F-8.

Habitat

Within the LFA, the habitat conditions rated 'poor.' But recent passage improvements and water acquisitions have created better habitat within the lower Beaver Creek subbasin. Confirmations from local fish biologists conclude that the lower reach is 'fair' habitat for four of the six parameters. Low scores were still given for passage and floodplain connectivity, and 'fair' for riparian condition which could change with future flow and stream restoration efforts.

Habitat scoring detail is available on Table F-9.

Flow

Gauge:Yes Rule:No Comments: An NHD+ estimated 26 cfs Mean Annual Flow was used to score this reach. Diversions evaluated for this project represent 57 percent of the Mean Annual Flow; reaches with diversions more than 15% of Mean Annual Flow scored 'poor' for this scoring component. Overall flow volume (relative to other reaches in this WRIA) boosted this reach to 'fair' status.

Flow scoring detail is available on Table F-10.

4816 - Beaver Creek (Reach 2)

Fish	Habitat	Flow
1	2	1

Fish Status/Utilization

Fish Status / Utilization in Beaver Creek (Reach 2) is significantly different than Beaver Creek (Reach 1). At this point in the creek, out of the four spring Chinook stocks only Lost River Spring Chinook are utilizing the reach and only for juvenile rearing. It is unlikely the other three stocks migrate this far upstream to rear. Two

other stocks, Methow Summer Chinook and coho, do not utilize this reach. In contrast bull trout utilize the reach for adult migration and juvenile rearing and Methow Summer Steelhead for all three life cycle stages. The reduction in utilization by the three spring Chinook stocks is enough to reduce the Fish Status / Utilization rating to ‘low.’

Fish Status/Utilization scoring detail is available on Table F-8.

Habitat

The upper reach of the Beaver Creek watershed rated ‘fair’ in all habitat categories except spawning and rearing conditions, where scores of ‘good’ were recorded. The upper reach still has some low flow and passage problems as documented in the Upper Columbia Salmon and Steelhead Recovery Plan. When “binning” for habitat condition, this reach scored at the low end of the “good” score compared with other reaches within the Methow subbasin.

Habitat scoring detail is available on Table F-9.

Flow

Gauge:Yes Rule:No Comments: The minimum of monthly mean flows in this reach is 7 cfs in October-February and the peak is 82 cfs in June . Minimum flow is 32 percent of the average. Diversions evaluated for this project represent 67 percent of the Mean Annual Flow; reaches with diversions more than 15% of Mean Annual Flow scored ‘poor’ for this scoring component.

Flow scoring detail is available on Table F-10.

4817 - Black Canyon Creek

Fish	Habitat	Flow
2	1	2

Fish Status/Utilization

Fish Status / Utilization for Black Canyon Creek rates ‘average.’ Seven stocks utilize this reach for juvenile rearing only. The exception is Methow Summer Steelhead which spawn, migrate and rear in this reach.

Fish Status/Utilization scoring detail is available on Table F-8.

Habitat

Within the Black Canyon watershed there are some steelhead spawning and therefore the rating of substrate was considered ‘fair.’ Rearing is also rated as ‘fair’ within the LFA and among area fish biologists. All other habitat parameters either had data gaps or were rated as ‘poor,’ yielding the overall score of ‘fair’ for this creek.

Habitat scoring detail is available on Table F-9.

Flow

Gauge:No Rule:No Comments: An NHD+ estimated 6 cfs Mean Annual Flow was used to score this reach. Diversions evaluated for this project represent 42 percent of the Mean Annual Flow; reaches with diversions more than 15% of Mean Annual Flow scored 'poor' for this scoring component.

Flow scoring detail is available on Table F-10.

4818 - Booth Canyon Creek

Fish	Habitat	Flow
2	1	2

Fish Status/Utilization

Like the majority of other primary tributaries to the mainstem, Fish Status / Utilization in Booth Canyon Creek is limited to juvenile rearing. Seven out of eight stocks rear in this reach year round. Methow Summer Chinook use Booth Canyon Creek seven out of 12 months of the year.

Fish Status/Utilization scoring detail is available on Table F-8.

Habitat

Booth Canyon Creek scored 'low' for all six habitat parameters, likely due to lower elevation and flow as in other area streams. Area fish biologists concurred with the low habitat scores.

Habitat scoring detail is available on Table F-9.

Flow

Gauge:No Rule:No Comments: An NHD+ estimated 2 cfs Mean Annual Flow was used to score this reach. Diversions evaluated for this project represent 2 percent of the Mean Annual Flow; reaches with diversions less than 5% of Mean Annual Flow scored 'fair' for this scoring component.

Flow scoring detail is available on Table F-10.

4819 - Frazer Creek

Fish	Habitat	Flow
1	2	1

Fish Status/Utilization

Frazer Creek, a tributary to Beaver Creek, has 'low' Fish Status / Utilization. Only Methow Summer Steelhead, bull trout and coho utilize this reach. Coho and bull trout rear only where as summer steelhead spawn, rear and migrate within the reach.

Fish Status/Utilization scoring detail is available on Table F-8.

Habitat

The 2000 LFA report indicates poor conditions for floodplain connectivity, riparian conditions, and passage. Upon review with area fish biologists, it was concluded that riparian conditions and passage should be ranked as 'fair,' giving Frazer Creek an overall score within the 'fair' bin. Spawning and rearing conditions were considered 'fair' and 'good,' respectively.

Habitat scoring detail is available on Table F-9.

Flow

Gauge:No Rule:No Comments: An NHD+ estimated 3 cfs Mean Annual Flow was used to score this reach. Diversion data used for this evaluation exceed the Mean Annual Flow.

Flow scoring detail is available on Table F-10.

4820 - Twisp River

Fish	Habitat	Flow
3	3	3

Fish Status/Utilization

The Twisp River has a high rating for Fish Status / Utilization rating. All eight stocks utilize this reach for at least juvenile rearing. In addition to rearing, bull trout adults migrate through this reach of the Twisp River. Twisp Spring Chinook and Methow Summer Steelhead utilize this reach for all three life cycle stages.

Fish Status/Utilization scoring detail is available on Table F-8.

Habitat

The LFA rated the lower Twisp River as having poor floodplain connectivity and riparian conditions. This was discussed with colleagues and changed to indicate 'fair' conditions for both. Off-channel habitat was rated as 'fair' by area fish biologists. Spawning, rearing, and passage conditions were given a 'good' score, leading to an overall bin score of 'good' for the Twisp River.

Habitat scoring detail is available on Table F-9.

Flow

Gauge:Yes Rule:Yes Comments: The minimum of monthly mean flows in this reach is 37 cfs in September and the peak is 954 cfs in June . Minimum flow is 14 percent of the average. Diversions evaluated for this project represent 31 percent of the Mean Annual Flow; reaches with diversions more than 15% of Mean Annual Flow scored 'poor' for this scoring component. The instream flow rule is higher than Mean Annual

Flow in only 1 month of the year, on average. Overall flow volume boosted the Twisp River's score to 'good.'

Flow scoring detail is available on Table F-10.

4821 - Poorman Creek

Fish	Habitat	Flow
1	2	1

Fish Status/Utilization

Poorman Creek is a tributary to the Twisp River but does not have the same Fish Status / Utilization as the Twisp. Fish Status / Utilization for Poorman Creek is 'low.' Only three out of the eight stocks found in the basin utilize Poorman Creek. Methow Summer Steelhead spawn, rear, and migrate in this reach where as bull trout and Twisp spring Chinook only rear in the reach.

Fish Status/Utilization scoring detail is available on Table F-8.

Habitat

The Upper Columbia Salmon and Steelhead Plan documents that a few steelhead spawn in Poorman Creek so that habitat parameter was given a 'fair' score. Floodplain connectivity and passage also received 'fair' scores from the LFA report. Riparian conditions and rearing were scored as 'good' after area discussions with WDFW and USFS biologists. Unfortunately, off-channel habitat conditions were considered 'poor' condition, giving the overall bin score of 'fair.'

Habitat scoring detail is available on Table F-9.

Flow

Gauge:No Rule:No Comments: An NHD+ estimated 2 cfs Mean Annual Flow was used to score this reach. Diversions evaluated for this project represent 48 percent of the Mean Annual Flow; reaches with diversions more than 15% of Mean Annual Flow scored 'poor' for this scoring component.

Flow scoring detail is available on Table F-10.

4822 - Little Bridge Creek

Fish	Habitat	Flow
1	3	2

Fish Status/Utilization

Little Bridge Creek is also a tributary to the Twisp River. Like Poorman Creek, Little Bridge Creek has a 'low' Fish Status / Utilization rating. Three stocks, Methow Summer Steelhead, Twisp spring Chinook and bull trout, out of eight stocks are found in Little Bridge Creek. Juvenile bull trout and Twisp Spring Chinook rear in this reach. In contrast Methow Summer Steelhead spawn, rear and migrate within the reach.

Fish Status/Utilization scoring detail is available on Table F-8.

Habitat

Floodplain connectivity, riparian conditions, and passage were rated as 'poor' within the LFA but were discussed and scored higher. Passage was scored higher due to correction of a large culvert near the mouth that had been considered a partial barrier to migrating salmonids. Riparian, rearing, and passage conditions were all ranked as 'good' during recent discussions and direct site observations. Spawning conditions were ranked as 'fair' considering the entire reach gradient with large boulder-type substrate, and the documentation of steelhead in the UCSSRP.

Habitat scoring detail is available on Table F-9.

Flow

Gauge:No Rule:No Comments: An NHD+ estimated 11 cfs Mean Annual Flow was used to score this reach. Diversions evaluated for this project represent 16 percent of the Mean Annual Flow; reaches with diversions more than 15% of Mean Annual Flow scored 'poor' for this scoring component.

Flow scoring detail is available on Table F-10.

4823 - Buttermilk Creek

Fish	Habitat	Flow
2	3	3

Fish Status/Utilization

Fish Status / Utilization in Buttermilk Creek, a tributary of the Twisp River, is 'average.' As with other Twisp River tributaries only three stocks utilize Buttermilk Creek. The difference between Fish Status / Utilization in Little Bridge Creek and Buttermilk Creek is that Twisp Spring Chinook and Methow Summer steelhead spawn, rear and migrate in Buttermilk Creek. Bull trout use this reach for rearing and adult migration.

Fish Status/Utilization scoring detail is available on Table F-8.

Habitat

The 2000 LFA reports good conditions for floodplain connectivity and passage. Personal observations and local biologists concur with those scores and indicate that riparian and rearing conditions should be scored higher than that of the LFA, at 'good.' Off-channel habitat gets the only 'poor' score due to steep gradient and channelization. The spawning of a few steelhead has been documented in the UCSSRP, giving a 'fair' score.

Habitat scoring detail is available on Table F-9.

Flow

Gauge:No Rule:No Comments: An NHD+ estimated 46 cfs Mean Annual Flow was used to score this reach. Diversions evaluated for this project represent 2 percent of the Mean Annual Flow; reaches with diversions less than 5% of Mean Annual Flow scored 'poor' for this scoring component.

Flow scoring detail is available on Table F-10.

4824 - Thompson Creek

Fish	Habitat	Flow
2	1	1

Fish Status/Utilization

Thompson Creek is a tributary of the Methow River and has an 'average' rating for Fish Status / Utilization. Seven out of eight stocks use this reach for only juvenile rearing and Twisp Spring Chinook not at all.

Fish Status/Utilization scoring detail is available on Table F-8.

Habitat

Thompson Creek is another small stream that has very little documentation but was rated an overall habitat score of 'poor' for each parameter. No documentation of spawning conditions was collected. Area biologists had little information but agreed that overall habitat rating should score 'poor.'

Habitat scoring detail is available on Table F-9.

Flow

Gauge:No Rule:No Comments: An NHD+ estimated 0.3 cfs Mean Annual Flow was used to score this reach. Diversion data used for this evaluation greatly exceed this estimate.

Flow scoring detail is available on Table F-10.

4825 - Bear Creek

Fish	Habitat	Flow
2	1	1

Fish Status/Utilization

Bear Creek another primary tributary to the Methow River has similar Fish Status / Utilization to Thompson Creek. Both have an 'average' Fish Status / Utilization rating and both support juvenile rearing for seven stocks. Twisp Spring Chinook is not found in Bear Creek.

Fish Status/Utilization scoring detail is available on Table F-8.

Habitat

The LFA indicates that the conversion of floodplain to agriculture, residential, and grazing use have negatively impacted floodplain functions. We conclude through direct observation that riparian and rearing conditions should be ranked as 'fair.' As this creek flows into a diversion channel and does not freely flow into the mainstem Methow, it should be scored accordingly. Some riparian restoration and flow augmentation efforts give this creek a 'fair' score within the habitat binning.

Habitat scoring detail is available on Table F-9.

Flow

Gauge:No Rule:No Comments: An NHD+ estimated 3 cfs Mean Annual Flow was used to score this reach. Diversion data used for this evaluation exceed the Mean Annual Flow estimate.

Flow scoring detail is available on Table F-10.

4826 - Chewuch River

Fish	Habitat	Flow
3	3	3

Fish Status/Utilization

The Chewuch River has a 'high' Fish Status / Utilization rating. The reach supports life cycle stages of seven Methow Basin stocks. The exception is Twisp Spring Chinook. The river supports all three lifecycle stages for Chewuch Spring Chinook, and Methow Summer Steelhead. Bull trout rear and migrate through the reach where as only juvenile rearing is present for Coho, Methow Summer Chinook, Lost River Spring Chinook and Methow spring Chinook.

Fish Status/Utilization scoring detail is available on Table F-8.

Habitat

The 2000 LFA report suggests a 'fair' condition for off-channel habitat due to road densities exceeding 3.5 miles/square mile along most of the Chewuch River corridor from RM 0.0 to RM 8.0. Area fish biologists agreed the score should be brought up to a 'good' condition status. For floodplain connectivity, the LFA ranks a 'fair' due to the lower 19.5 miles having low LWD levels, a reduced amount of adequate side channel habitat, accelerated bank erosion, and high sediment levels. Again, area biologists agreed that a score of 'good' should be given to that reach. The LFA also reported only 'fair' passage where the new score was considered as 'good' with recent flow augmentation agreements and partial barrier corrections at the Chewuch diversion site. Spawning is well documented in the LFA and UCSSRP and from personal observations. Overall the Chewuch scored a 'good,' bordering on excellent habitat score.

Habitat scoring detail is available on Table F-9.

Flow

Gauge:Yes Rule:No Comments: The minimum of monthly mean flows in this reach is 77 cfs in September and the peak is 1,621 cfs in May. Minimum flow is 19 percent of the average. Diversions evaluated for this project represent 3 percent of the Mean Annual Flow; reaches with diversions less than 5% of Mean Annual Flow scored 'good' for this scoring component. 'Good' status also reflects the higher flow volume relative to other reaches in this WRIA.

Flow scoring detail is available on Table F-10.

4827 - Cub Creek

Fish	Habitat	Flow
1	2	3

Fish Status/Utilization

Cub Creek, which is a tributary to Chewuch River, rates 'low' for Fish Status / Utilization. This 'low' rating is based on only three out of the eight stocks present in the creek and of those minimal life cycle stages are expressed. Chewuch Spring Chinook and bull trout utilize the creek for juvenile rearing, whereas Methow Summer Steelhead use the creek for spawning, rearing and adult migration.

Fish Status/Utilization scoring detail is available on Table F-8.

Habitat

Off-channel, floodplain, and riparian conditions were all scored 'poor' during the initial review from research and reference documents. After meetings with local biologists from WDFW and USFS, scores were changed to 'fair' or 'good' in Cub Creek.

There were also discussions of a small natural barrier near the mouth that reduced the passage score to ‘fair.’ Overall the creek was given a habitat score of ‘fair.’

Habitat scoring detail is available on Table F-9.

Flow

Gauge:No Rule:No Comments: An NHD+ estimated 7 cfs Mean Annual Flow was used to score this reach. No diversion data are available in this reach. Although flows are low, the ‘good’ status score reflects the higher flow volume relative to many other reaches in this WRIA.

Flow scoring detail is available on Table F-10.

4828 - Ramsey Creek

Fish	Habitat	Flow
1	1	2

Fish Status/Utilization

Ramsey Creek is also a tributary of Chewuch River that has a ‘low’ Fish Status / Utilization score. Ramsey Creek differs from Cub Creek in that four stocks; Chewuch Spring Chinook, Methow Summer Steelhead, bull trout and coho are present in the creek and juvenile rearing is the only life cycle stages expressed.

Fish Status/Utilization scoring detail is available on Table F-8.

Habitat

Ramsey Creek, like other area creeks, is small and documented in the LFA as being confined to a ditch. The alluvial fan for this creek has been under cultivation for over 75 years and the entire stream margin along the fan is rip-rapped. There is very little documentation available evaluate all habitat attributes; given its small size and channelized reach, the overall score was given a ‘poor.’

Habitat scoring detail is available on Table F-9.

Flow

Gauge:No Rule:No Comments: An NHD+ estimated 1.3 cfs Mean Annual Flow was used to score this reach. Some water right claims, but no diversion volume, tipped this reach from ‘poor’ to ‘fair’ condition.

Flow scoring detail is available on Table F-10.

4829 - Little Boulder Creek

Fish	Habitat	Flow
2	2	2

Fish Status/Utilization

Five out of eight stocks are present in Little Boulder Creek. What limits this creek to 'average' Fish Status / Utilization is the expression of life cycle stages. Methow Summer Steelhead is the only stock that spawns, rears and uses Little Boulder Creek for adult migration. The others; bull trout, coho, Methow Summer Chinook, Lost River Spring Chinook and Methow Spring Chinook utilize the reach for juvenile rearing. Fish Status/Utilization scoring detail is available on Table F-8.

Habitat

After discussions with a USFS biologist to review the 'poor' status given in the LFA report, it was determined that passage should be rated as 'fair.' Other parameters were agreed on through the LFA reports such as 'poor' floodplain connectivity and 'fair' riparian conditions. Spawning and rearing conditions were also considered 'fair.' The creek was ranked as 'fair' overall for habitat condition.

Habitat scoring detail is available on Table F-9.

Flow

Gauge:No Rule:No Comments: An NHD+ estimated 3 cfs Mean Annual Flow was used to score this reach. No diversion volumes were identified in this reach.

Flow scoring detail is available on Table F-10.

4830 - Wolf Creek

Fish	Habitat	Flow
2	3	1

Fish Status/Utilization

Wolf Creek, a tributary to the Methow mainstem, also rates 'average' for Fish Status / Utilization. Three stocks, Methow Spring Chinook, bull trout and Methow Summer Steelhead use the creek for all three life cycle stages. In contrast, Lost River Spring Chinook, Methow Summer Chinook, and coho utilize the reach for juvenile rearing.

Fish Status/Utilization scoring detail is available on Table F-8.

Habitat

The LFA indicates that Wolf Creek is a spawning and rearing stream for fluvial bull trout, summer steelhead, and spring Chinook, ranking it as 'good' for spawning and

rearing habitat conditions. Floodplain connectivity and riparian conditions were rated as ‘fair’ in the LFA. Biologists we consulted conclude that floodplain connectivity hasn’t changed much, but that riparian conditions are better now and should be raised to a ‘good’ score. Overall this reach scored ‘good.’

Habitat scoring detail is available on Table F-9.

Flow

Gauge:Yes Rule:No Comments: Diversion data used for this evaluation equal or exceed the Mean Annual Flow.

Flow scoring detail is available on Table F-10.

4831 - Little Falls Creek

Fish	Habitat	Flow
2	1	3

Fish Status/Utilization

Little Boulder Creek and Little Falls Creek have many similar Fish Status / Utilization activities, both rate ‘average’ for fish use. In addition, Methow Summer Steelhead utilize the reach for all three life cycle stages. Juvenile rearing is the only trait expressed by coho, bull trout, Methow Summer Chinook, Methow Spring Chinook and Lost River Spring Chinook.

Fish Status/Utilization scoring detail is available on Table F-8.

Habitat

Little Falls Creek is another small stream that has very little documentation but was rated an overall habitat score of ‘poor’ for each parameter. No documentation of spawning conditions was found. This creek receives only passing reference in the LFA. Area biologists had little information but agreed that overall habitat rating should score ‘poor.’

Habitat scoring detail is available on Table F-9.

Flow

Gauge:No Rule:No Comments: An NHD+ estimated 3 cfs Mean Annual Flow was used to score this reach. No diversion data are available in this reach, which is undoubtedly the reason this reach appears to have ‘good’ flow condition.

Flow scoring detail is available on Table F-10.

4832 - Fawn Creek

Fish	Habitat	Flow
2	1	1

Fish Status/Utilization

Fawn Creek is like Little Boulder Creek and Little Falls Creek in that juvenile rearing is the only trait expressed by coho, bull trout, Methow Summer Chinook, Methow Spring Chinook and Lost River Spring Chinook, where as Methow Summer Steelhead express all three life cycle stages. As a result this creek also rates 'average' for fish use.

Fish Status/Utilization scoring detail is available on Table F-8.

Habitat

Fawn Creek is another small stream that has very little documentation but was rated an overall habitat score of 'poor' for each parameter. There is discussion of the need for LWD and a lower reach diversion within the creek. Fawn Creek, which is not known to support salmonids, has an irrigation withdrawal at the mouth of the Creek for group domestic use in the Edelweiss subdivision. Area biologists had little information but agreed that overall habitat rating should score low.

Habitat scoring detail is available on Table F-9.

Flow

Gauge:No Rule:No Comments: An NHD+ estimated 3 cfs Mean Annual Flow was used to score this reach. Diversions evaluated for this project represent 17 percent of the Mean Annual Flow; reaches with diversions more than 15% of Mean Annual Flow scored 'poor' for this scoring component.

Flow scoring detail is available on Table F-10.

4833 - Goat Creek

Fish	Habitat	Flow
2	2	3

Fish Status/Utilization

Goat Creek also rates 'average' for Fish Status / Utilization. The same stocks are present in Goat Creek as Fawn Creek. The slight difference between the two creeks is that bull trout express juvenile and adult migration and juvenile rearing rather than just juvenile rearing and migration. Coho, Methow Summer Chinook, Methow Spring Chinook and Lost River Spring Chinook utilize the creek for juvenile rearing and migration and Methow Summer Steelhead for all three life cycle stages.

Fish Status/Utilization scoring detail is available on Table F-8.

Habitat

For Goat Creek habitat scoring, initial review found that floodplain connectivity and riparian conditions were rated as ‘poor.’ Review and discussion with USFS fish biologists found that the riparian conditions are better now and should be given a ‘good’ score. All other parameters were scored as ‘fair,’ reflecting the overall habitat score of ‘fair.’

Habitat scoring detail is available on Table F-9.

Flow

Gauge:No Rule:No Comments: An NHD+ estimated 20 cfs Mean Annual Flow was used to score this reach. No diversion data are available in this reach. The relatively high flow volume in comparison to other reaches in this WRIA tipped the overall score for this reach to ‘good.’

Flow scoring detail is available on Table F-10.

4834 - Gold Creek

Fish	Habitat	Flow
3	2	2

Fish Status/Utilization

The ‘high’ Fish Status / Utilization rating for Gold Creek is attributed to the number of stocks present in the stream (all eight) and the number of life cycle stages they express. Methow Spring Chinook and Methow Summer Steelhead express all three traits; bull trout express adult and juvenile migration and juvenile rearing; and Twisp Spring Chinook, Lost River Spring Chinook, Chewuch Spring Chinook, Methow Summer Chinook and coho juveniles rear in the creek.

Fish Status/Utilization scoring detail is available on Table F-8.

Habitat

Off channel and passage scores were originally indicated as ‘poor’ from literature review. Meetings with WDFW and USFS area fish biologists determined that these two parameters should be boosted to ‘fair’ now. All other parameters were scored ‘fair’ except for rearing which was scored ‘good.’

Habitat scoring detail is available on Table F-9.

Flow

Gauge:No Rule:No Comments: An NHD+ estimated 70 cfs Mean Annual Flow was used to score this reach. Diversions evaluated for this project represent 16 percent of the Mean Annual Flow; reaches with diversions more than 15% of Mean Annual Flow scored

‘poor’ for this scoring component. These results combine to achieve a ‘fair’ score overall.

Flow scoring detail is available on Table F-10.

4835 - Early Winters Creek

Fish	Habitat	Flow
2	2	3

Fish Status/Utilization

Fish presence drops to six stocks in Early Winter Creek but still maintains a ‘average’ Fish Status / Utilization rating. Bull trout, Methow Summer Steelhead and Methow Spring Chinook utilize this creek for all three life cycle stages. In contrast Lost River Spring Chinook, Methow Summer Chinook and coho utilize the stream for juvenile rearing.

Fish Status/Utilization scoring detail is available on Table F-8.

Habitat

The LFA states that the construction of State Highway 20, recreational use, irrigation withdrawal, diking, and residential development have had significant impacts in the lower 1.5 miles of Early Winters Creek. The off-channel habitat score was set at ‘fair’ after discussions with area biologist and direct personal observations. The lower 0.5 mile of Early Winters Creek has been rip-rapped and diked. From RM 0.0 - 1.9 the channel is incising as a result of rip-rapping and diking in the lower reach, leading to an increased stream gradient, the loss of pool habitat, increased stream velocities in riffle-run habitat, and the loss of spawning gravels. Rearing and passage were ranked as ‘good’ but overall the habitat conditions fall within the ‘fair’ bin.

Habitat scoring detail is available on Table F-9.

Flow

Gauge:Yes Rule:No Comments: The minimum monthly mean flow in this reach is 18 cfs in January and the peak is 535 cfs in June. Minimum flow is 15 percent of the average. Diversions evaluated for this project represent 3 percent of the Mean Annual Flow; reaches with diversions less than 5% of Mean Annual Flow scored ‘good’ for this scoring component. These results combined with high flow volume yield a ‘good’ score for this creek.

Flow scoring detail is available on Table F-10.

5. Scoring Sheets

Table F-8 Fish Scoring Sheet

Color / Bin Score

3 = High/Good
2 = Average / Fair
1 = Low / Poor

Code	Reach Name	Reach Score & Bin	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
4801	Methow River (Reach 2)	551	37	38	41	37	52	47	52	55	57	56	40	39
4802	Methow River (Reach 1)	515	33	34	37	37	52	47	48	51	53	52	36	35
4803	Methow River (Reach 3)	455	33	34	37	33	40	35	40	43	45	44	36	35
4804	Squaw Creek	295	24	25	25	25	25	25	25	25	24	24	24	24
4805	French Creek	295	24	25	25	25	25	25	25	25	24	24	24	24
4806	Petes Creek	295	24	25	25	25	25	25	25	25	24	24	24	24
4807	McFarland Creek	295	24	25	25	25	25	25	25	25	24	24	24	24
4808	Cow Creek	295	24	25	25	25	25	25	25	25	24	24	24	24
4809	Libby Creek	325	24	25	31	31	31	28	28	28	27	24	24	24
4810	Texas Creek	295	24	25	25	25	25	25	25	25	24	24	24	24
4811	Puckett Creek	295	24	25	25	25	25	25	25	25	24	24	24	24
4812	Leecher Canyon	295	24	25	25	25	25	25	25	25	24	24	24	24
4813	Benson Creek	295	24	25	25	25	25	25	25	25	24	24	24	24
4814	Alder Creek	295	24	25	25	25	25	25	25	25	24	24	24	24
4815	Beaver Creek (Reach 1)	370	26	27	33	33	36	31	31	31	32	31	31	28
4816	Beaver Creek (Reach 2)	171	10	10	16	16	19	16	16	16	16	13	13	10
4817	Black Canyon Creek	325	24	25	31	31	31	28	28	28	27	24	24	24
4818	Booth Canyon Creek	295	24	25	25	25	25	25	25	25	24	24	24	24
4819	Frazer Creek	126	8	8	14	14	14	11	11	11	11	8	8	8
4820	Twisp River	442	34	35	38	34	38	35	39	42	41	38	34	34
4821	Poorman Creek	150	10	10	16	16	16	13	13	13	13	10	10	10

Code	Reach Name	Reach Score & Bin	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
4822	Little Bridge Creek	150	10	10	16	16	16	13	13	13	13	10	10	10
4823	Buttermilk Creek	231	14	14	20	16	23	20	24	24	24	21	17	14
4824	Thompson Creek	247	20	21	21	21	21	21	21	21	20	20	20	20
4825	Bear Creek	247	20	21	21	21	21	21	21	21	20	20	20	20
4826	Chewuch River	394	30	31	34	30	34	31	35	38	37	34	30	30
4827	Cub Creek	171	13	13	16	16	16	13	13	16	16	13	13	13
4828	Ramsey Creek	144	12	12	12	12	12	12	12	12	12	12	12	12
4829	Little Boulder Creek	229	16	17	23	23	23	20	20	20	19	16	16	16
4830	Wolf Creek	337	23	24	30	26	33	27	31	31	33	30	26	23
4831	Little Falls Creek	229	16	17	23	23	23	20	20	20	19	16	16	16
4832	Fawn Creek	229	16	17	23	23	23	20	20	20	19	16	16	16
4833	Goat Creek	250	16	17	23	23	26	23	23	23	22	19	19	16
4834	Gold Creek	406	28	29	35	31	38	35	39	39	38	35	31	28
4835	Early Winters Creek	337	23	24	30	26	33	27	31	31	33	30	26	23
Monthly Totals			760	788	896	864	946	869	904	922	911	856	792	768

Note: Reach names link to workbook tabs

Table F-8 Fish Scoring Sheet - continued

SaSI Stocks in the Methow Basin	SaSI Stock Rating	SaSI Weight Factor
Twisp Spring Chinook- 1840	Critical	3
Methow Spring Chinook- 1824	Critical	3
Lost River Spring Chinook- 1848	Critical	3
Chewuch Spring Chinook- 1844	Critical	3
Methow Summer Chinook- 1832	Healthy	1
Methow Summer Steelhead- 6912	Unknown	2
Coho - SaSI stock not assigned	Unknown	2
Bull Trout - Wolf Creek- 8876	Unknown	2
Bull Trout - West Fork Methow- 8720	Unknown	2
Bull Trout - WF Buttermilk Creek- 8768	Depressed	
Bull Trout - Beaver Creek- 8744	Healthy	
Bull Trout - Cedar Creek- 8912	Depressed	
Bull Trout - Cougar Lake- 8852	Unknown	

SaSI Stocks in the Methow Basin	SaSI Stock Rating	SaSI Weight Factor
Bull Trout - Early Winters- 8890	Critical	2
Bull Trout - EF Buttermilk Creek- 8780	Critical	
Bull Trout - First Hidden Lake- 8804	Depressed	
Bull Trout - Goat Creek- 8888	Depressed	
Bull Trout - Gold Creek- 8732	Critical	
Bull Trout - Lake Creek- 8864	Depressed	
Bull Trout - Lost River- 8792	Critical	
Bull Trout - Middle Hidden Lake- 8816	Unknown	
Bull Trout - Monument Creek- 8828	Critical	
Bull Trout - Reynolds Creek- 8840	Critical	
Bull Trout - Twisp- 8756	Critical	

** Weighting Factor Values by SaSI Stock Status:	Weight
Healthy	1
Depressed	2
Unknown	2
Critical	3

Weighting Factor for Federally Listed Species:	ESA Weight Factor
Assign additional weight to stocks that are listed as Threatened or Endangered under the ESA? (yes=1; no=0)	1
Assign additional weight to reaches within Interior Columbia TRT-designated spawning areas (MaSAs or MiSAs)? (yes=1; no=0)	0

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Color / Bin Score

3 = High/Good

2 = Average / Fair

1 = Low / Poor

Table F-9 Habitat Scoring Sheet

Code	Reach Name	Total Score	Off Channel Habitat (OCHs)	Flood-plain Connectivity	Riparian Condition	Spawning Suitability	Rearing Suitability	Passage Condition
4801	Methow River (Reach 1)	15	2	2	2	3	3	3
4802	Methow River (Reach 2)	14	2	2	2	2	3	3
4803	Methow River (Reach 3)	19	3	3	3	3	4	3
4804	Squaw Creek	6	1	1	1	1	1	1
4805	French Creek	6	1	1	1	1	1	1
4806	Petes Creek	6	1	1	1	1	1	1
4807	McFarland Creek	6	1	1	1	1	1	1
4808	Cow Creek	6	1	1	1	1	1	1
4809	Libby Creek	13	2	2	2	2	3	2
4810	Texas Creek	6	1	1	1	1	1	1
4811	Puckett Creek	6	1	1	1	1	1	1
4812	Leecher Canyon	6	1	1	1	1	1	1
4813	Benson Creek	6	1	1	1	1	1	1
4814	Alder Creek	6	1	1	1	1	1	1
4815	Beaver Creek (Reach 1)	11	1	1	2	2	2	3
4816	Beaver Creek (Reach 2)	14	2	2	2	3	3	2
4817	Black Canyon Creek	8	1	1	2	2	1	1
4818	Booth Canyon Creek	6	1	1	1	1	1	1
4819	Frazer Creek	11	1	1	2	2	3	2
4820	Twisp River	15	2	2	2	3	3	3
4821	Poorman Creek	13	1	2	3	2	3	2
4822	Little Bridge Creek	15	2	2	3	2	3	3
4823	Buttermilk Creek	15	1	3	3	2	3	3
4824	Thompson Creek	6	1	1	1	1	1	1
4825	Bear Creek	8	1	1	2	1	2	1
4826	Chewuch River	18	3	3	3	3	3	3
4827	Cub Creek	13	2	3	2	2	2	2
4828	Ramsey Creek	6	1	1	1	1	1	1
4829	Little Boulder Creek	10	1	1	2	2	2	2
4830	Wolf Creek	16	2	2	3	3	3	3

Code	Reach Name	Total Score	Off Channel Habitat (OCHs)	Flood-plain Connectivity	Riparian Condition	Spawning Suitability	Rearing Suitability	Passage Condition
4831	Little Falls Creek	6	1	1	1	1	1	1
4832	Fawn Creek	6	1	1	1	1	1	1
4833	Goat Creek	11	2	1	2	2	2	2
4834	Gold Creek	13	2	2	2	2	3	2
4835	Early Winters Creek	13	2	1	2	2	3	3

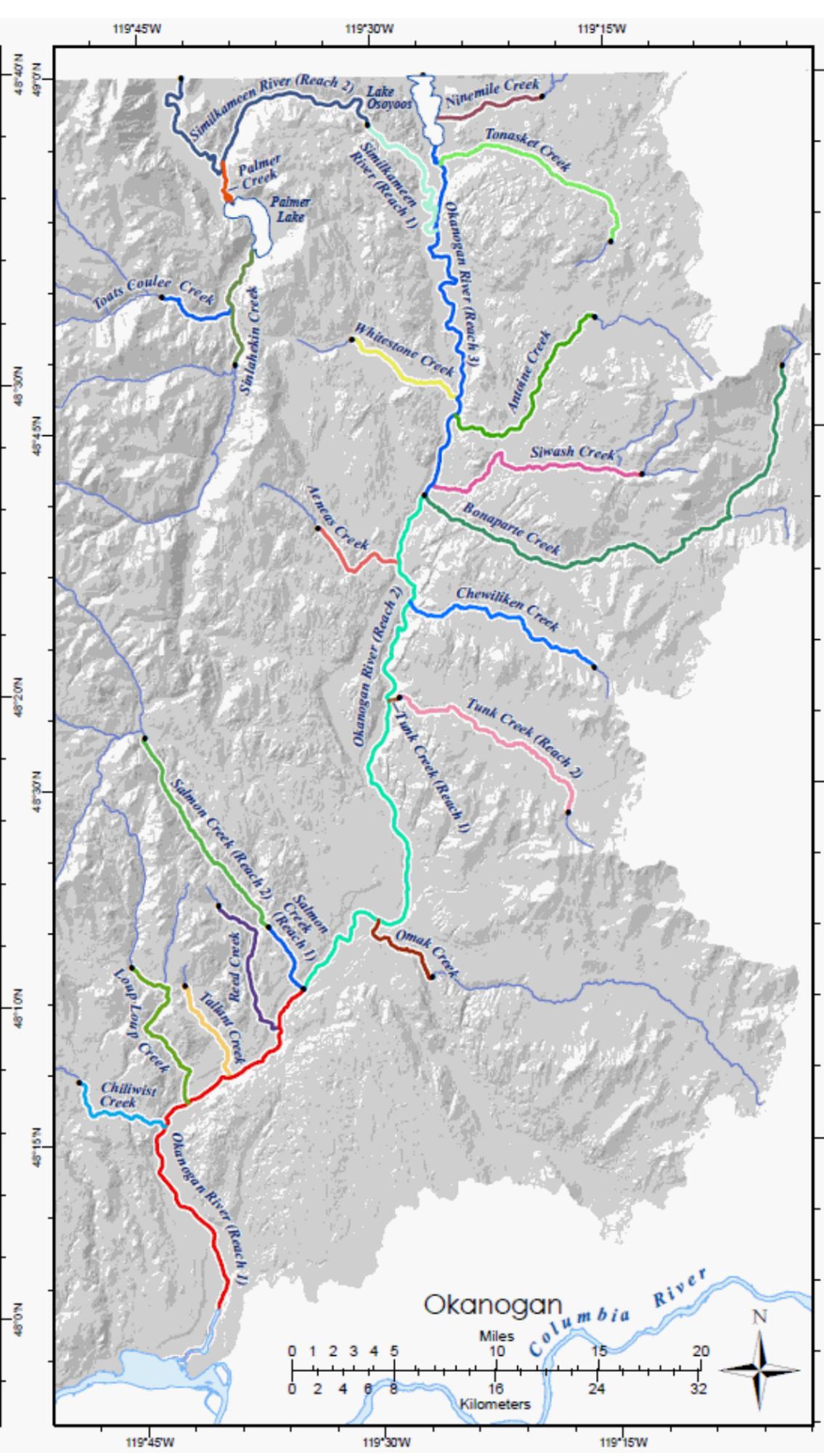
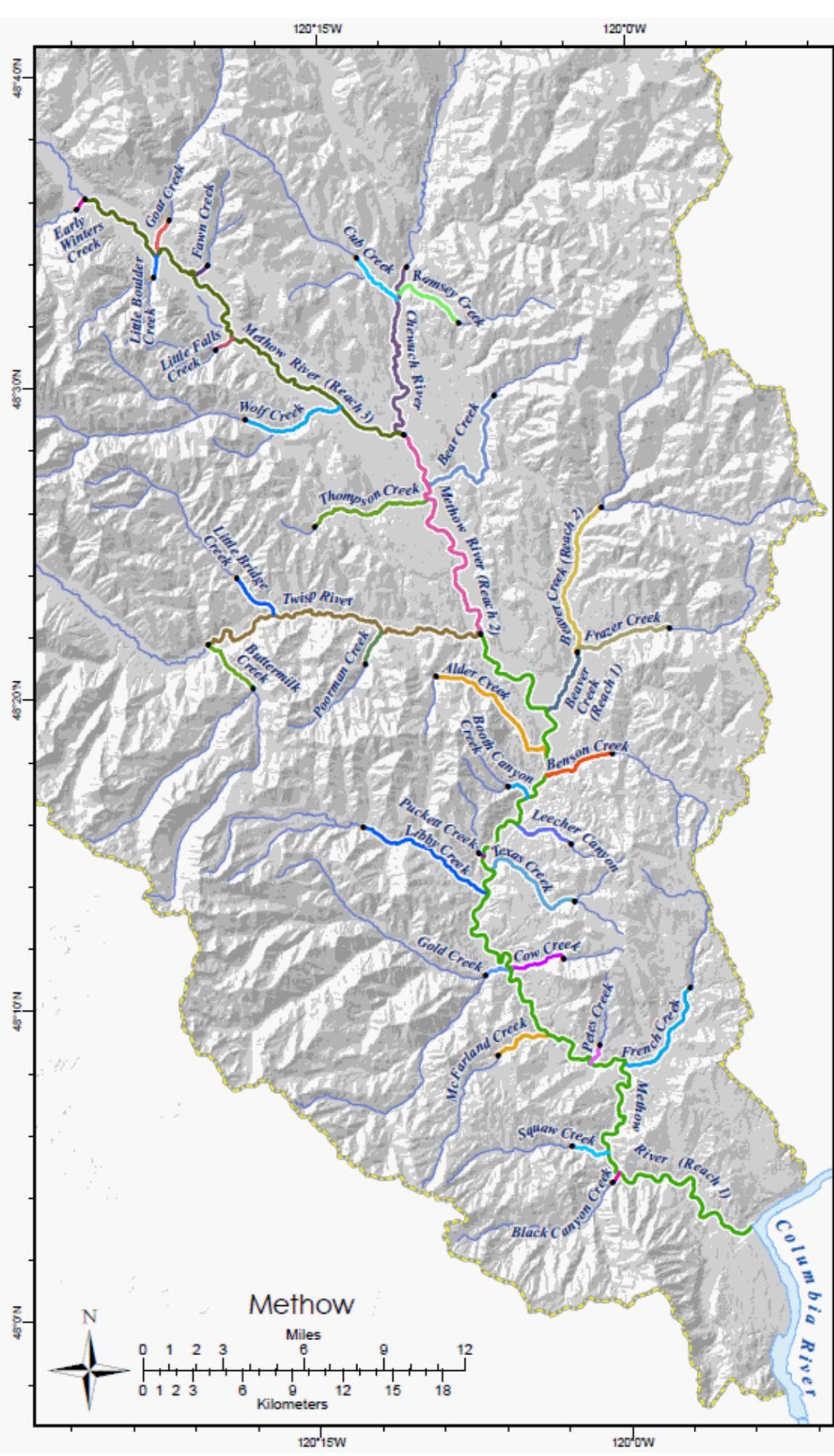


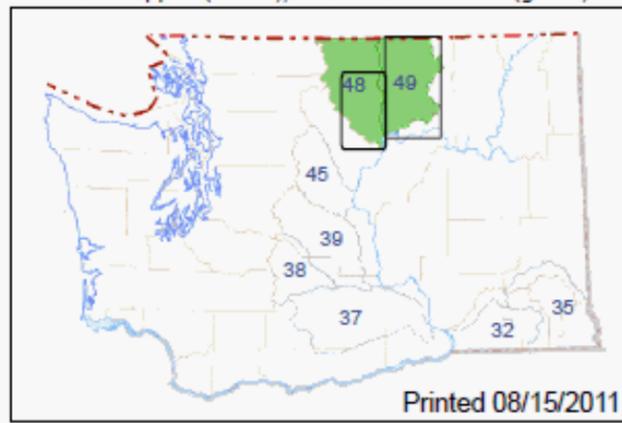
Figure F-1 Assessed Stream Reaches



Methow and Okanogan River Basins
WRIAs 48 and 49
Assessed Stream Reaches
colored for visual reference

- — Assessed Stream Reach upper extents
- Continuation of Assessed Streams to Headwaters

Location of all project WRIAs (blue), location of the areas mapped (boxed), and featured WRIAs (green).



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Figure F-2 Combined Prioritization Scores Fish, Habitat, & Flow



Methow and Okanogan River Basins
WRIAs 48 and 49
Combined Prioritization Scores for Fish, Habitat, and Flow

Scores for Fish Status and Utilization and Current Habitat Condition are visually represented using the following color scheme:

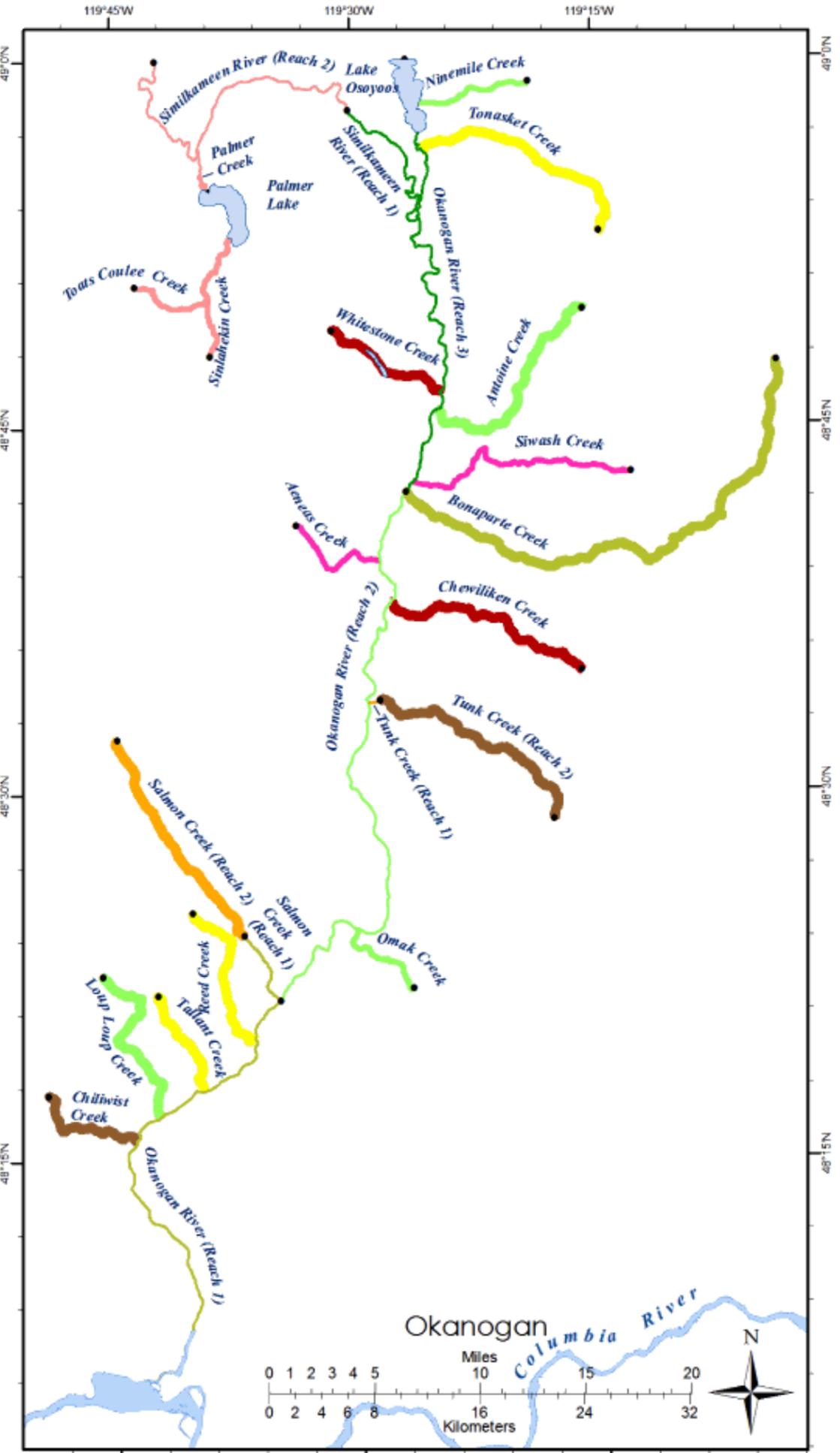
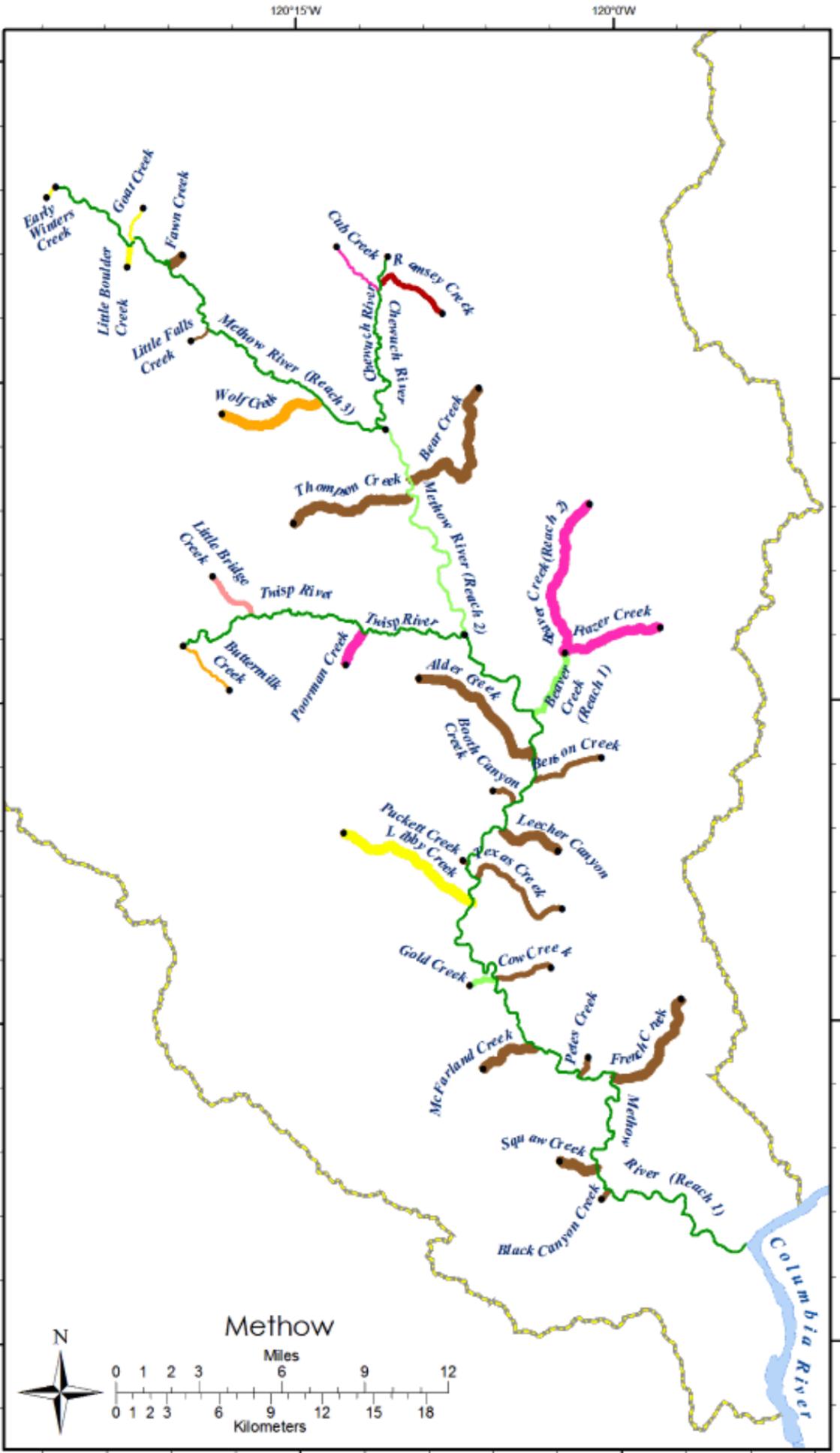
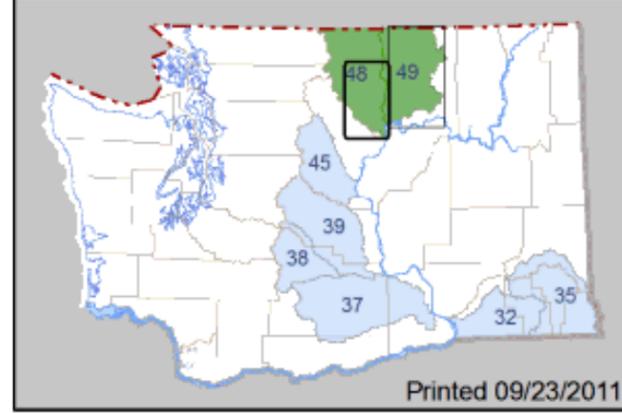
Fish Score			Habitat Score
Low	Med	High	

Line thicknesses represent Flow Condition

- Good
- Fair
- Poor

• — Assessed Stream Reach upper extents
 WRIA Boundary

Location of all project WRIAs (blue), location of the areas mapped (boxed), and featured WRIAs (green).



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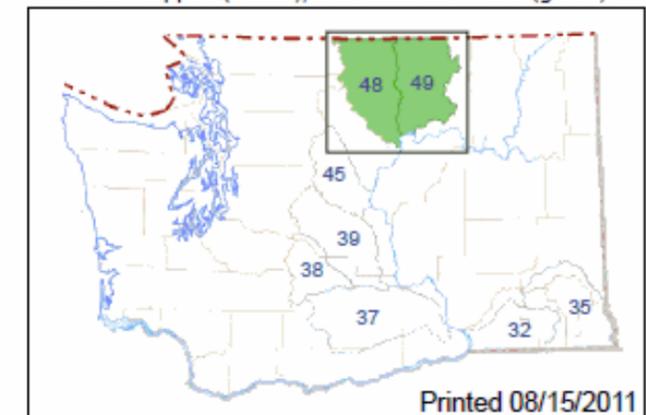
Figure F-32001 Statewide 1m Orthophoto



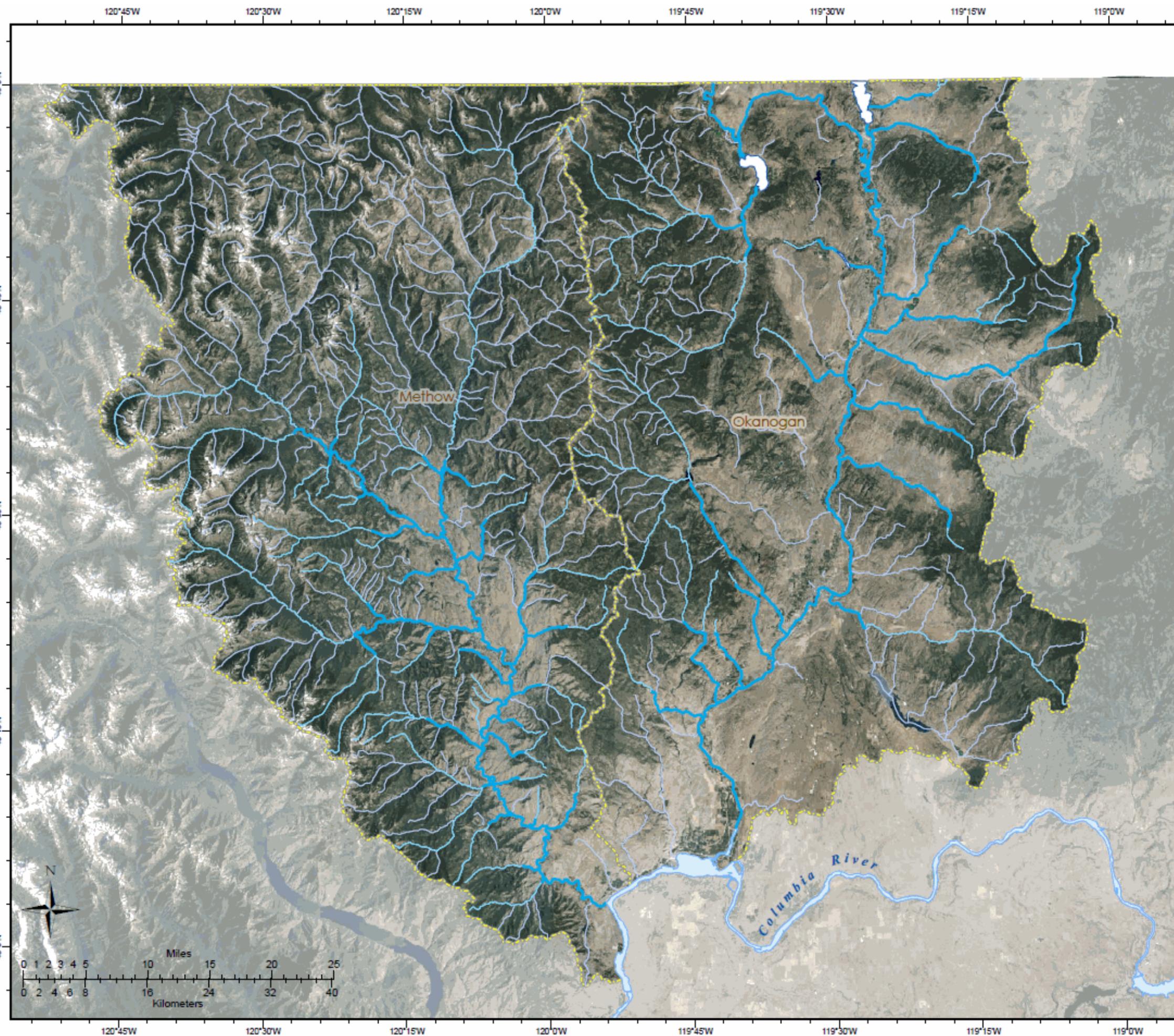
**Methow and Okanogan
River Basins
WRIAs 48 and 49
2009 Statewide 1m Orthophoto**

- Stream Distinctions
- Assessed Reaches
 - Headwaters of Assessed Reaches
 - Other Named Streams
- WRIA Boundary

Location of all project WRIAs (blue), location of the area mapped (boxed), and featured WRIAs (green).



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Figure F-4 2001 National Land Cover Database



**Methow and Okanogan
River Basins
WRIAs 48 and 49
2001 National
Land Cover Database**

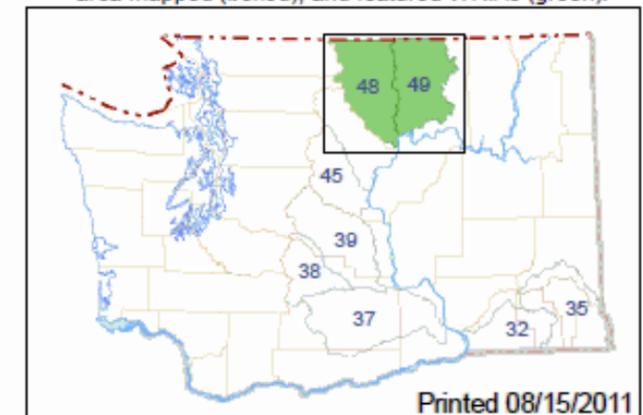
Land Cover and Use

-  Snow and Ice
-  Developed
-  Barren
-  Forest
-  Scrub
-  Grasslands
-  Agriculture
-  Riparian

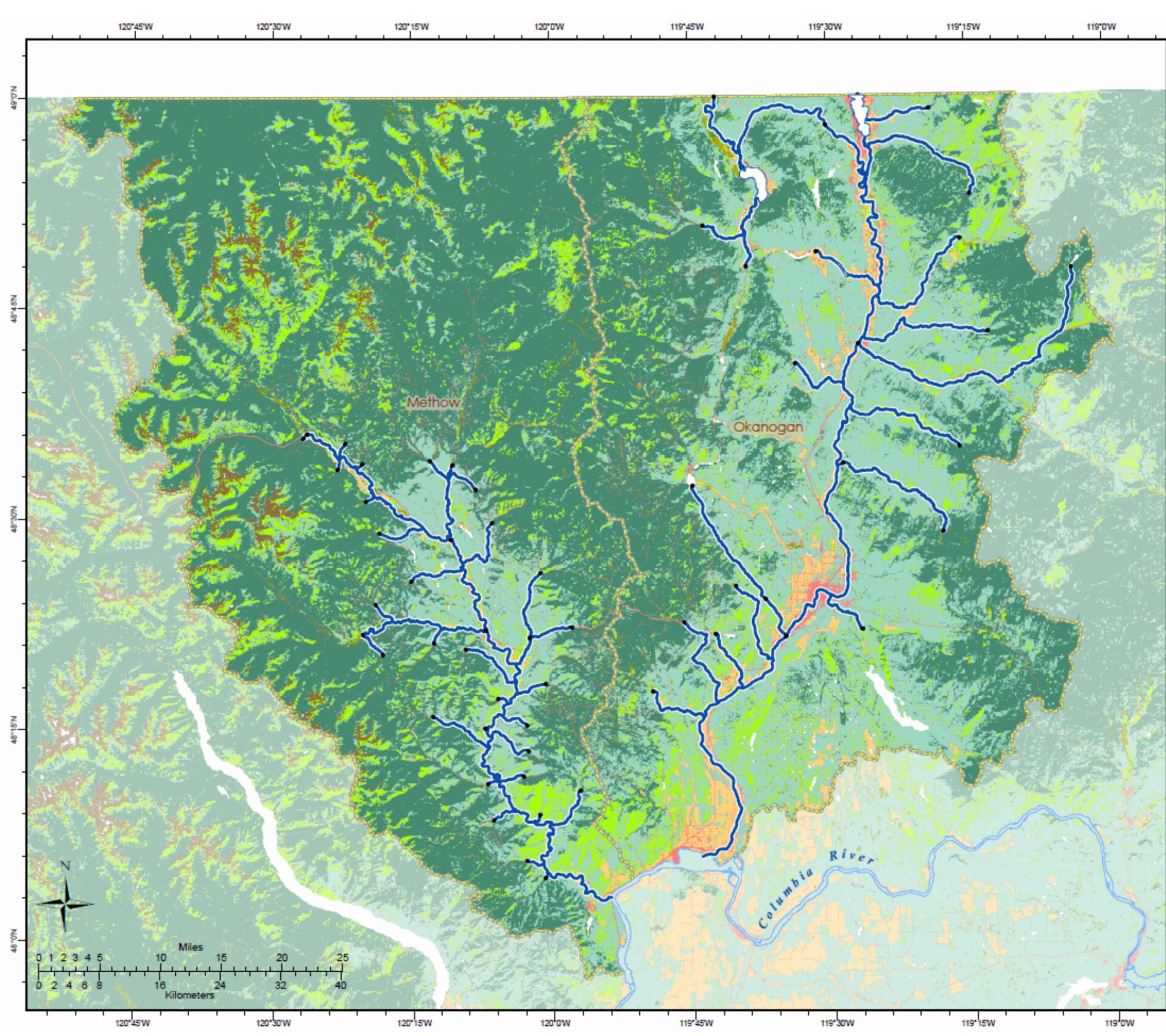
Assessed Stream Reaches with upper extents marked



Location of all project WRIAs (blue), location of the area mapped (boxed), and featured WRIAs (green).



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Figure F-5 Stream Gauge Identification and Land Management



**Methow and Okanogan River Basins
WRIAs 48 and 49
Stream Gauge Identification
and Land Management**

Stream Gauges by Agency

- WA DOE
- WA DOE (limited data)
- USBR
- USGS
- USGS (limited data)

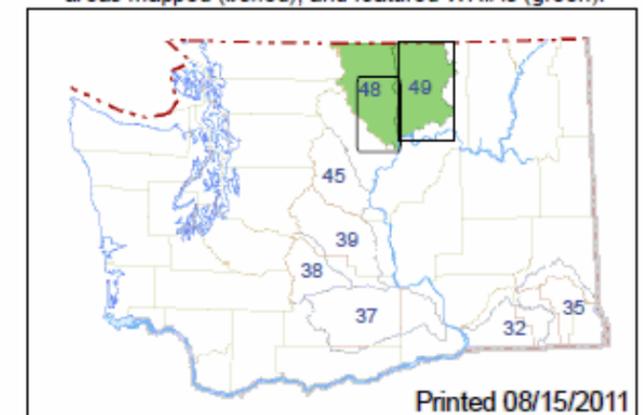
Generalized Land Management

- Tribal
- US Bureau of Land Mgmt.
- US Bureau of Reclamation
- US Forest Service
- WA Dept. Fish & Wildlife
- WA Dept. Natural Resources

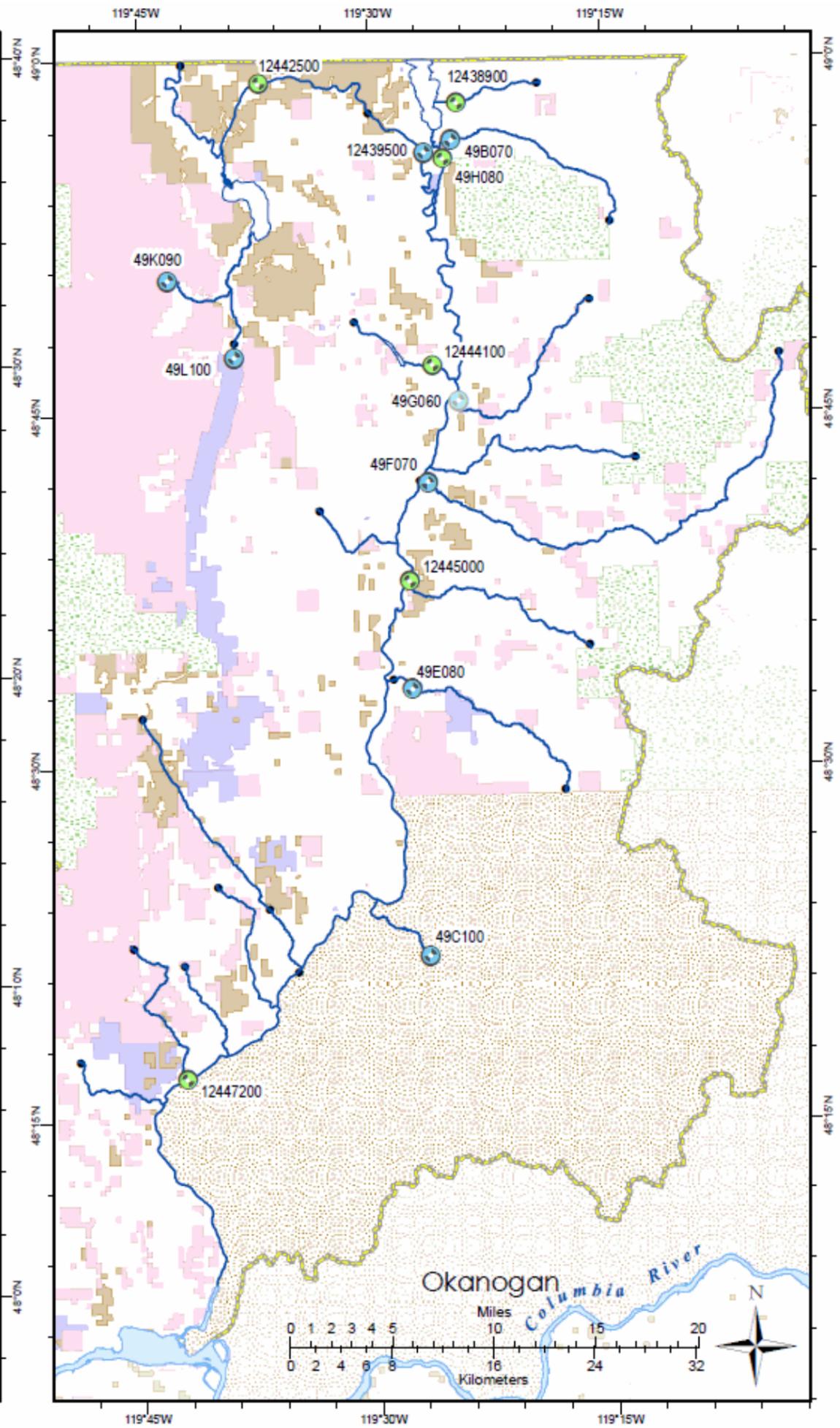
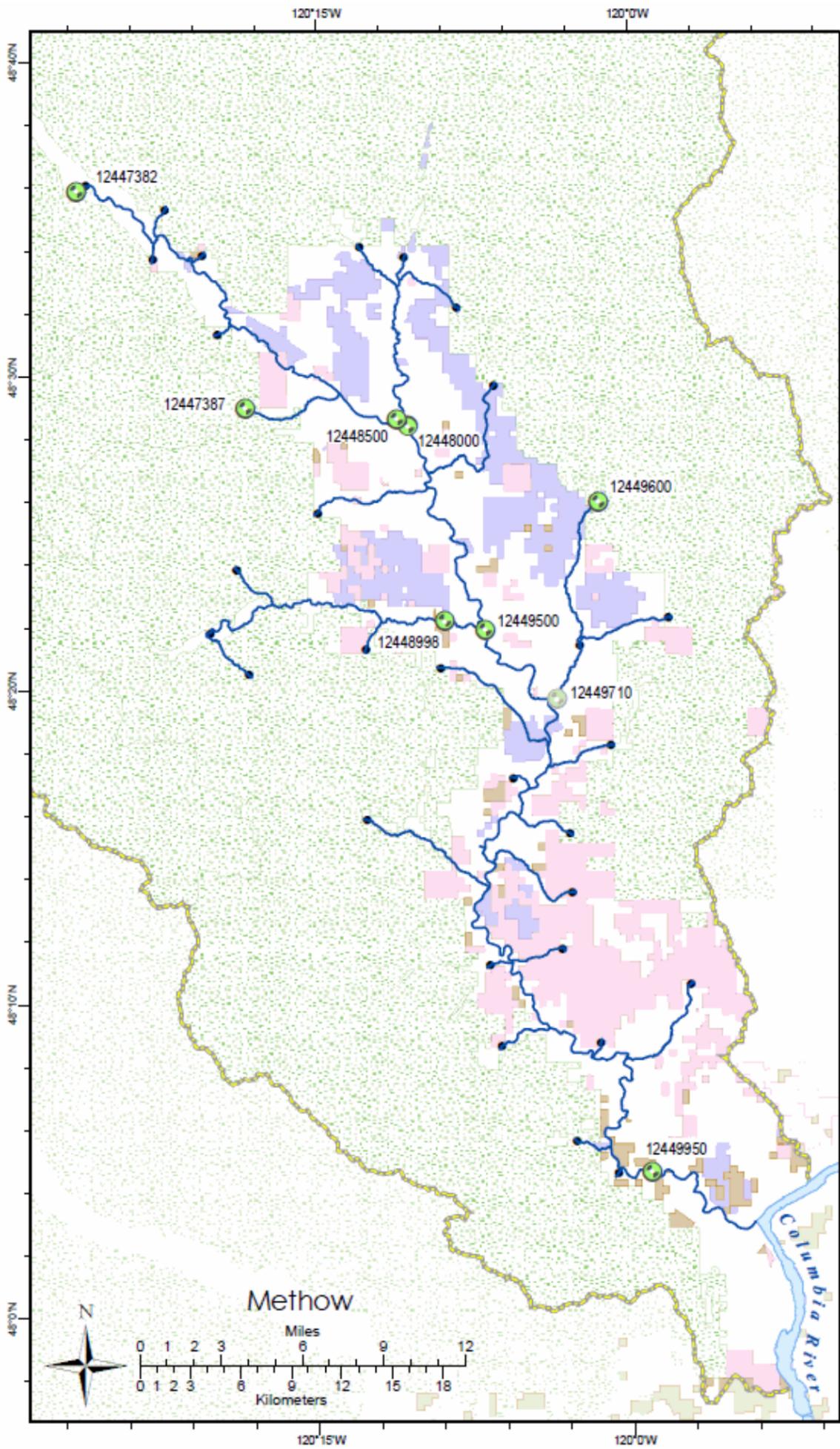
Assessed Stream Reaches with upper extents marked

WRIA Boundary

Location of all project WRIAs (blue), location of the areas mapped (boxed), and featured WRIAs (green).



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WRIAs 48 and 49 - Methow and Okanogan River Basins - Gauges, Lands