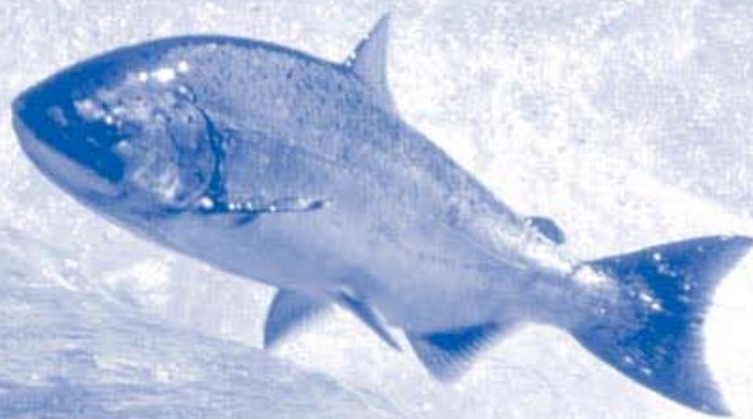


RECLAMATION

Managing Water in the West

FCRPS BiOp Tributary Habitat Expert Panel Overview



April 9, 2012



U.S. Department of the Interior
Bureau of Reclamation

Today's Topics

- Background
- Tributary habitat action
- Expert Panel process
- EP prep tasks
- Integration
- Summary



RECLAMATION

Background

- FCRPS BiOp = ESA consultation on operation and maintenance of 14 FCRPS facilities through 2018
- Action Agencies (BPA/Reclamation/COE) developed a Proposed Action and submitted a Biological Assessment to ESA regulatory agency
- Regulatory agency (NOAA Fisheries) issued Biological Opinion on effects of PA on 13 ESA-listed species of salmon and steelhead and their critical habitat
- This generally describes the FCRPS BA/ BiOp consultation– other alternatives possible for different consultations depending on scope/scale of PA

Background

FCRPS BiOp consultation history

- 1993-2000 (hydro only)
- 1999 Biological Assessment / 2000 FCRPS BiOp
- 2004 Remand
- 2006 Habitat Collaboration Workgroup
- 2007 BA - 2008 Comprehensive Analysis/ 2008 FCRPS BiOp
- 2009 Adaptive Management Implementation Plan
- 2010 Supplemental FCRPS BiOp (combines 2008 FCRPS BiOp + 2009 AMIP)

RECLAMATION

Background

2010 Supplemental FCRPS BiOp

- Proposed Action developed through regional collaboration with States and Tribes
- Resulting BiOp includes 73 Reasonable and Prudent Alternatives (RPAs)
- Hydro – Hatcheries – Predation – Estuary Habitat – Tributary Habitat
- Research, Monitoring, and Evaluation (RM&E)
- Biological analysis characterizes adverse effects of the AA PA that is offset by the 73 RPAs in the BiOp

RECLAMATION

Today's Topics

- Background
- **Tributary habitat action**
- Expert Panel process
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- Summary

Tributary Habitat Action

- Approach developed in 2006 through the Habitat Collaboration Workgroup
- Scope derived from Biological Analysis
- RPA 35 table 5



Table 5. Estimated Habitat Quality Improvements

ESU	Major Population Group	Population	Estimated Percentage Habitat Quality Improvement of 2007-2009 Actions	Total Estimated Percentage Habitat Quality Improvement of 2007-2018 Actions
Snake River Spring/Summer Chinook	Grand Ronde/Imnaha	Catherine Creek	4	23
		Lostine/Wallowa River	2	2 *
		Grand Ronde River upper mainstem	2	23
		Imnaha River mainstem	1	1 *
	Middle Fork Salmon River	Big Creek	1	1 *
	South Fork Salmon River	Secesh River	1	1 *
		South Fork Salmon River Mainstem	<1	<1 *
	Lower Snake	Tucannon River	7	17
	Upper Salmon River	East Fork Salmon River	1	1 *
		Lemhi River	7	7 *
		Pahsimeroi River	41	41 *
		Salmon River lower mainstem below Redfish Lake	1	1 *
		Salmon River upper mainstem above Redfish Lake	14	14 *
		Valley Creek	1	1 *
	Upper Columbia Spring Chinook	Upper Columbia – Below Chief Joseph	Yankee Fork	10
Entiat River			10	22
Methow River			2	6
		Wenatchee River	1	3

Table 5. Estimated Habitat Quality Improvements (continued)

ESU	Major Population Group	Population	Estimated Percentage Habitat Quality Improvement of 2007-2009 Actions	Total Estimated Percentage Habitat Quality Improvement of 2007-2018 Actions
Middle Columbia Steelhead	Cascades Eastern Slope Tributaries	Deschutes River – eastside	1	1 *
		Deschutes River – Westside	<1	<1 *
		Fifteen mile Creek (winter run)	<1	<1 *
		Klickitat River	4	4 *
	John Day River	John Day River lower mainstem tributaries	<1	<1 *
		John Day River upper mainstem	<1	<1 *
		Middle Fork John Day River	<1	<1 *
		North Fork John Day River	<1	<1 *
		South Fork John Day River	1	1 *
	Umatilla and Walla Walla River	Touchet River	4	4 *
		Umatilla River	4	4 *
		Walla Walla River	4	4 *
	Yakima River Group	Naches River	4	4 *
		Satus Creek	4	4 *
		Toppenish	4	4 *
		Yakima River upper mainstem	4	4 *
Snake River Steelhead	Clearwater River	Lochsa River	6	16
		Lolo Creek	8	12
		Selway River	<1	<1
		South Fork Clearwater River	5	14

Table 5. Estimated Habitat Quality Improvements (continued)

ESU	Major Population Group	Population	Estimated Percentage Habitat Quality Improvement of 2007-2009 Actions	Total Estimated Percentage Habitat Quality Improvement of 2007-2018 Actions
Snake River Steelhead	Grand Ronde River	Grand Ronde River lower mainstem tributaries	<1	<1 *
		Grand Ronde River upper mainstem	4	4 *
		Joseph Creek (OR)	<1	<1 *
		Joseph Creek (WA)	4	4 *
		Wallowa River	<1	<1 *
	Hells Canyon	Hells Canyon		
	Imnaha River	Imnaha River		*
	Lower Snake	Asotin Creek	4	4 *
		Tucannon River	5	5 *
	Salmon River	Lower Middle Fork mainstem and tribs (Big, Camas, and Loon Creeks)	1	2
		East Fork Salmon River	2	2 *
		Lemhi River	3	3 *
		Pahsimeroi River	9	9 *
		Salmon River upper mainstem	6	6 *
		Secesh River	1	6
South Fork Salmon River		<1	1	
Upper Columbia Steelhead	Upper Columbia River – below Chief Joseph	Entiat River	6	8
		Methow River	2	4
		Okanogan River	12	14
		Wenatchee River	1	4

* The Action Agencies may provide funding and/or technical assistance for replacement projects should they become necessary for the Action Agencies to achieve equivalent MPG or ESU survival benefits.

Today's Topics

- Background
- Tributary habitat action
- **Expert Panel process**
- EP prep tasks
- Integration
- Summary

Expert Panel Process

- Developed by HCW
- Relies on professional judgement supplemented with current scientific information
- Expert Panels:
 - Convened every three years
 - Compare scope and metrics of habitat improvement actions planned three years ago to those actually completed over the last three year cycle
 - Evaluate changes in limiting factors associated with habitat improvement actions actually completed
 - Actual LF changes could be less, same, or more than estimated 3 years ago- depends on what was actually completed compared to what was planned

Expert Panel Process

- **Expert Panels (continued):**
 - Also evaluate changes in limiting factors associated with habitat improvement actions planned for completion in the next cycle
- EPs consider current biological, climate change, invasive species, and toxics information
- EPs only evaluate changes in Limiting Factors for habitat improvement actions with AA involvement
- AAs roll up changes in Limiting Factors and convert to changes in Habitat Quality/Survival using the HCW method
- Documented in 2007 Comprehensive Analysis

Expert Panel Process

- Habitat improvement actions and associated metrics planned for completion in the next cycle are reported in the Implementation Plan issued by the AAs every three years (RPA 1)
- Completed habitat improvement actions and associated metrics for actions identified in the Implementation Plan (and other habitat improvement actions completed in addition to or in place of those identified in the IP) are reported every year in Annual Progress Reports (RPA 2)
- Implementation Plans and Annual Progress Reports are posted at salmonrecovery.gov

Expert Panel Process

Example

- Planned and completed habitat improvement actions
- Limiting factor changes
- Conversion to Habitat Quality/Survival changes

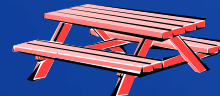


Table 16a.-- Planned 2010-12 tributary habitat actions and metrics for the Entiat River population of Upper Columbia River steelhead and Upper Columbia River spring Chinook salmon.

Assessment Unit (AU)	Primary Limiting Factor(s) (PLF) by AU	Actions	2010	2010	2011	2011	2012	2012	Comments
			Metric	Planned Value	Metric	Planned Value	Metric	Planned Value	
Lower Entiat	Low Stream flow	Continue Knapp-Wham and Hanan Detwiler irrigation ditch consolidation effort							
Lower Entiat		Continue exploring extension of Entiat Irrigation District line upstream to serve PUD canal/system users							
Lower Entiat		Pursue other water conveyance efficiency and diversion improvements	cubic feet/second restored to stream	2 cfs (McKenzie); USBR stimulus well conversions ~ 2 cfs; Roaring Cr. Well conversion ~ 1.5 cfs; BOP					Surface water effect, savings will be somewhat less.
Lower Entiat		Improve on-farm irrigation application efficiency, scheduling, and general water conservation.		2 cfs (McKenzie); USBR stimulus well conversions ~ 2 cfs; Roaring Cr. Well conversion ~ 1.5 cfs; BOP					Surface water effect, savings will be somewhat less.
Lower Entiat		Provide technical and cost-share assistance for water metering and reporting							
Lower Entiat		Continue conversion of surface water diversions to ground water/well withdrawals, when feasible	cubic feet/second restored to stream	1 cfs (surface to wells)					
Lower Entiat	Riparian condition	Implement riparian planting projects with willing landowners							
Lower Entiat		Work with willing landowners to protect larger, undisturbed riparian areas by first pursuing conservation easement, lease, and options other than outright property acquisition							
Lower Entiat	Floodplain connectivity	Implement Ecosystem Diagnosis and Treatment (EDT) Alternative 5 related to side-channel options	miles of river restored	0.2 miles (Foreman)	miles of river restored	0.3 miles (hatchery)			
Lower Entiat	Habitat diversity	Implement EDT Alternative 5, focusing on pool forming structures	miles of river treated	0.2 miles (lower screw trap); 0.2 miles (Foreman); 0.3 miles (B2B Phase 3)	miles of river restored	0.3 miles (4 mile bridge); 0.3 miles (hatchery); 0.3 miles (LBS); 0.3 miles (Keystone)			
									CMB review comment: implement action in next cycle, 2014, per IMW

Table 15b2.-- Biological benefits associated with completed 2007-09 and planned 2010-12 tributary habitat actions for the Entiat River population of Upper Columbia River spring Chinook salmon.

Spring Chinook - Entiat River

Code	Assessment Unit	Limiting Factor	2007-2009 VALUES								2010-2012 VALUES					
			Low Bookend	Original 07-09 values		High Bookends		LF Weight	Updated 07-09 values		Starting Low Bookend	10-12 Estimates		Updated High Bookends		Updated LF Weight
				2018	2033	2018	2033		2018	2033		2018	2033	2018	2033	
ERC1	Lower Entiat	Excessive Fine Sediment									23	24	24	30	30	10
ERC1	Lower Entiat	Floodplain connectivity	20	20	20	21	21	16.67	20.2	20.2	20	21	21	21	21	6
ERC1	Lower Entiat	Habitat diversity	15	23	23	41	41	16.67	17	17	15	19	19	41	41	20
ERC1	Lower Entiat	Habitat quantity	15	23	23	41	41	16.67	17	17	15	19	19	41	41	35
ERC1	Lower Entiat	Low Stream flow	80	84	84	87	87	16.67	84	84	80	85	85	87	87	2
ERC1	Lower Entiat	Obstructions/entrainment ¹														
ERC1	Lower Entiat	Riparian condition	30	33	36	35	40	16.67	30	30	30	30	30	35	40	2
ERC1	Lower Entiat	Side-channel connectivity	10	12	12	15	15	16.67	11	11	10	12	12	15	15	25
ERC2	Mad River	Habitat diversity	90	90	90	97	99	33.33	91	91	91	91	91	97	99	33.33
ERC2	Mad River	Habitat quantity	90	90	90	97	99	33.33	90	90	90	90	90	97	99	33.33
ERC2	Mad River	Improve streamflow ¹														
ERC2	Mad River	Two obstructing pipes in Tillicum	98	98	98	100	100	33.33	98	98	98	98	98	100	100	33.33
ERC3	Middle Entiat	Excessive Fine Sediment									23	24	24	30	30	40
ERC3	Middle Entiat	Habitat diversity	60	65	70	65	70	33.33	60	60	60	62	62	70	80	35
ERC3	Middle Entiat	Riparian condition	80	85	90	85	90	33.33	80	80	80	81	82	85	90	20
ERC3	Middle Entiat	Stormy obstructions to passage	93	99	99	99	99	33.33	93	93	93	93	93	99	99	5
ERC3	Middle Entiat	Water Quantity ¹														

1. Added new LF in 2009 Expert Panel Workshop but did not establish low/high bookends or LF Weights

- Updated 2007-09 values greater than corresponding Initial 2007-09 values
- 2010-12 estimate values greater than corresponding Updated 2007-09 values
- Updated bookend value greater than corresponding prior bookend value
- Updated Limiting Factor Weight different from prior Limiting Factor Weight
- Value less than corresponding prior value

Example- conversion from expert panel habitat functions to habitat quality (survival) changes for a sample population

Example Expert Panel habitat function table

Population	Assessment Unit	Limiting Factor	Initial Habitat Function (Low Bookend)	ESTIMATED HABITAT FUNCTION CHANGES FOR NEXT 3-YEAR IMPLEMENTATION CYCLE		High Bookends		Limiting Factor Weight (I)
				2018	2033	2018	2033	
Steelhead Example population	AU #1	Lack of passage - Lack of access to diversity of habitats.	50	60	60	75	85	50
	AU #1	Loss of riparian vegetation and complexity - lack of stream shading resulting in elevated temperatures	60	62	64	70	80	20
	AU #1	Sediment from roads, timber harvest, cattle grazing,- effects on rearing and spawning success, interstitial space and pool volume.	40	40	40	55	65	30
	AU #2	High summer water temperature	50	55	57	60	75	25
	AU #2	Lack of passage - Lack of access to diversity of habitats,	60	65	65	75	85	25
	AU #2	Loss of riparian function from grazing and floodplain development	40	43	46	50	65	25
	AU #2	Sediment from upstream sources	60	60	60	70	80	25
	AU #3	Lack of passage - Lack of access to diversity of habitats.	65	70	70.4	75	85	40
	AU #3	Loss of riparian vegetation and complexity - lack of stream shading resulting in elevated temperatures	60	66.4	71	80	85	10
	AU #3	Reduced channel complexity from streamside roads, reduced LWD & historic dredge mining	60	60	60.4	65	75	10
AU #3	Sediment from roads, timber harvest, cattle grazing,- effects on rearing and spawning success, interstitial space and pool volume	50	55.6	58.4	65	75	40	

Population	Assessment Unit	Limiting Factor	Initial Habitat Function (Low Bookend)	ESTIMATED HABITAT FUNCTION CHANGES FOR NEXT 3-YEAR IMPLEMENTATION CYCLE		High Bookends		Limiting Factor Weight (I)
				2018	2033	2018	2033	
Steelhead Example population	AU #4	Lack of passage - Lack of access to diversity of habitats,	30	42	43	90	95	40
	AU #4	Loss of riparian vegetation and complexity - lack of stream shading resulting in elevated temperatures	60	65	69.6	70	75	10
	AU #4	Sediment from roads, timber harvest, cattle grazing, and historic mining - effects on rearing and spawning success, interstitial space and pool volume.	40	45	46	55	70	50
	AU #5	Lack of passage - Lack of access to diversity of habitats	80	80.2	80.4	85	90	10
	AU #5	Loss of riparian vegetation and complexity	60	60	61	70	80	40
	AU #5	Sediment from roads, timber harvest, cattle grazing, and historic mining - effects on rearing and spawning success, interstitial space and pool volume.	55	55.6	56	65	75	50

Example conversion from Expert Panel habitat functions to habitat quality (survival) changes

Assessment Unit	Assessment Unit Weight	INITIAL VALUES			ESTIMATED CHANGES FOR NEXT 3-YEAR IMPLEMENTATION CYCLE		
		Average Weighted Initial AU Habitat Function (E)	Col E * egg/smolt survival: steelhead = 0.0004 Chinook= 0.0018 (F)	Habitat Quality Index (G)	Average Weighted AU Habitat Function for Next Cycle (H)	Col H * egg/smolt survival: steelhead = 0.0004 Chinook= 0.0018 (I)	Habitat Quality Index (J)
AU #1	2	49	0.0196	0.0392	54.4	0.02176	0.04352
AU #2	7	52.5	0.021	0.147	55.75	0.0223	0.1561
AU #3	71.7	58	0.0232	1.66344	62.88	0.025152	1.8033984
AU #4	7.4	38	0.0152	0.11248	45.8	0.01832	0.135568
AU #5	12.2	59.5	0.0238	0.29036	59.82	0.023928	0.2919216
Total				2.25248			2.430508
Population Habitat Quality Change							1.07903644

Columns E and H contain formulas that calculate the average habitat function for each assessment unit considering limiting factor weight (Expert Panel habitat function table, col I)

Columns F and I apply the egg/smolt survival factor
Columns G and J apply the assessment unit weighting factor

Habitat Quality change from initial to next cycle = col J/col G (from row above)

Percentage change = (column J - 1.0) * 100, or 7.9%

See the 2007 FCRPS Comprehensive Analysis, Appendix C, pp. C-1-13 to C-1-14, for explanations of the calculations shown in this example

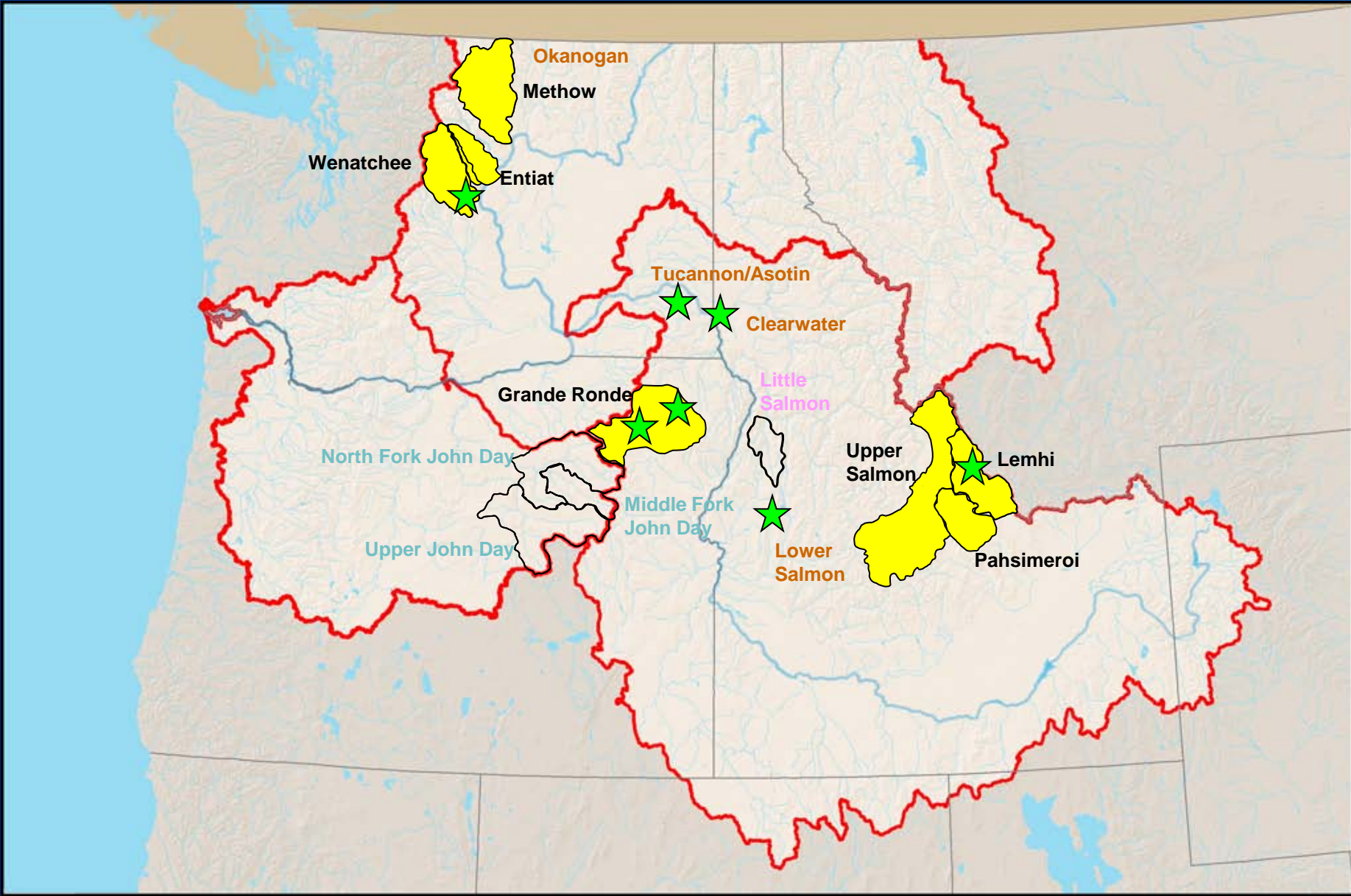
Today's Topics

- Background
- Tributary habitat action
- Expert Panel process
- **EP prep tasks**
- Integration
- Summary

EP Prep tasks

- Standardizing Limiting Factors
- Building list of 2009-2012 completed projects
- Building list of 2013-2018 projects
- Developing database system to manage workshop proceedings
- Working w/NOAA NWFSC to support EPs (and watershed planning groups) with readily-available, relevant monitoring info
- [EP web page](#) is a resource for the expert panels
- EP workshops completed April - June

Expert Panel Locations



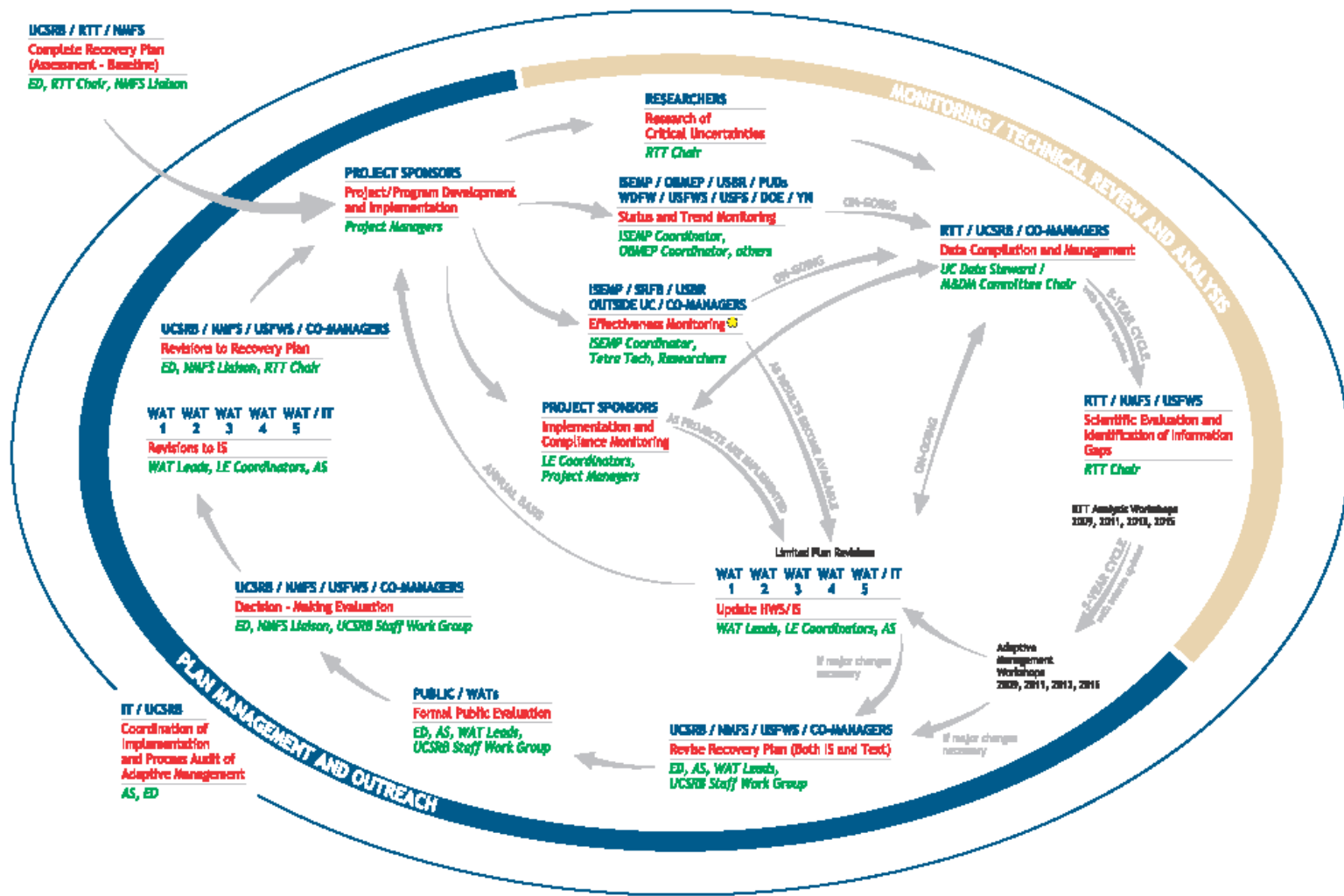
Today's Topics

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- **Integration**
- Summary

Integration

- **USBR- BPA- NOAA- NPCC- CRITFC- Watershed Partners**
- **Planning – Funding – Implementation – Reporting – RME
– Adaptive Management**

HABITAT ADAPTIVE MANAGEMENT FRAMEWORK - FOR UPPER COLUMBIA SALMON RECOVERY -



LEGEND

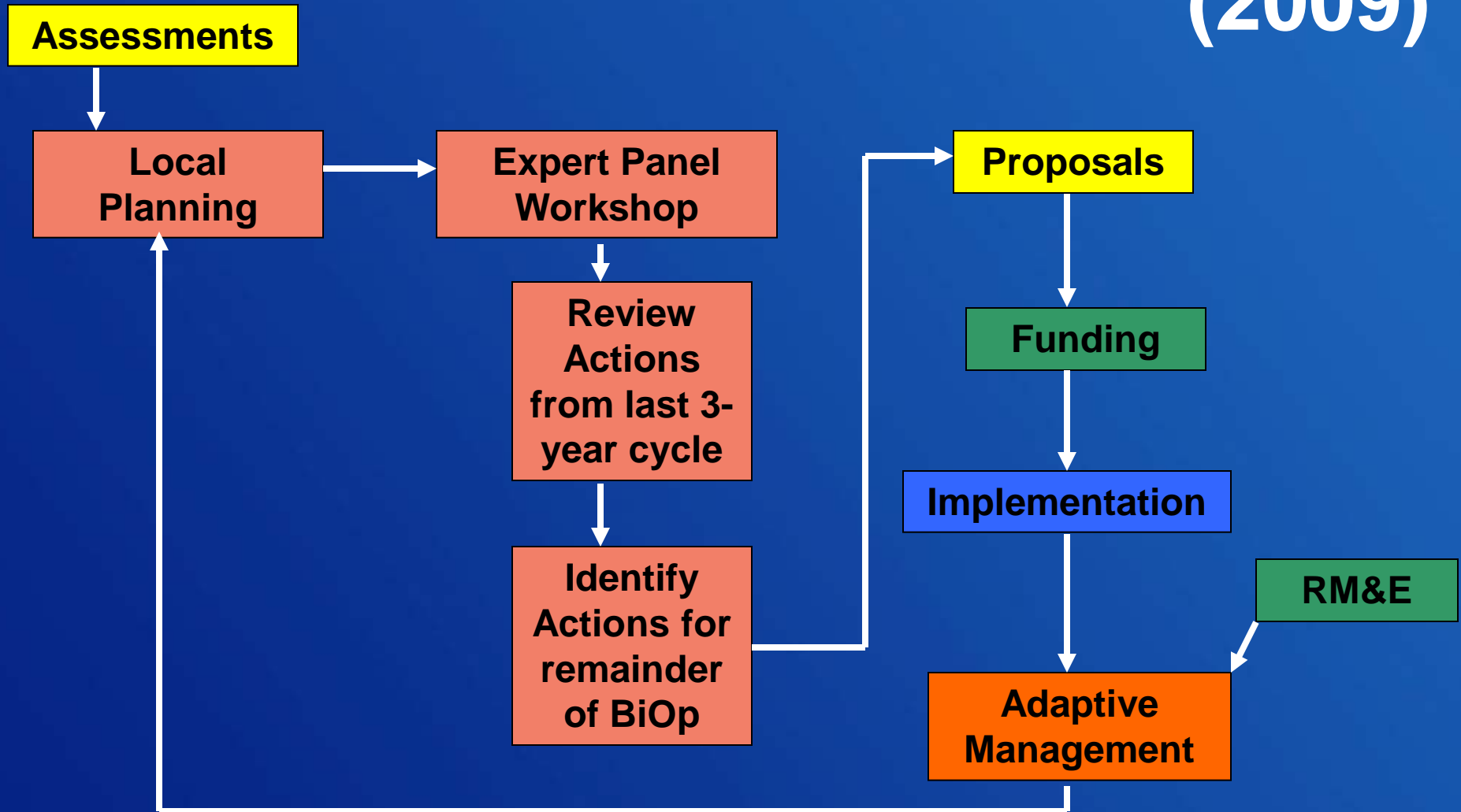
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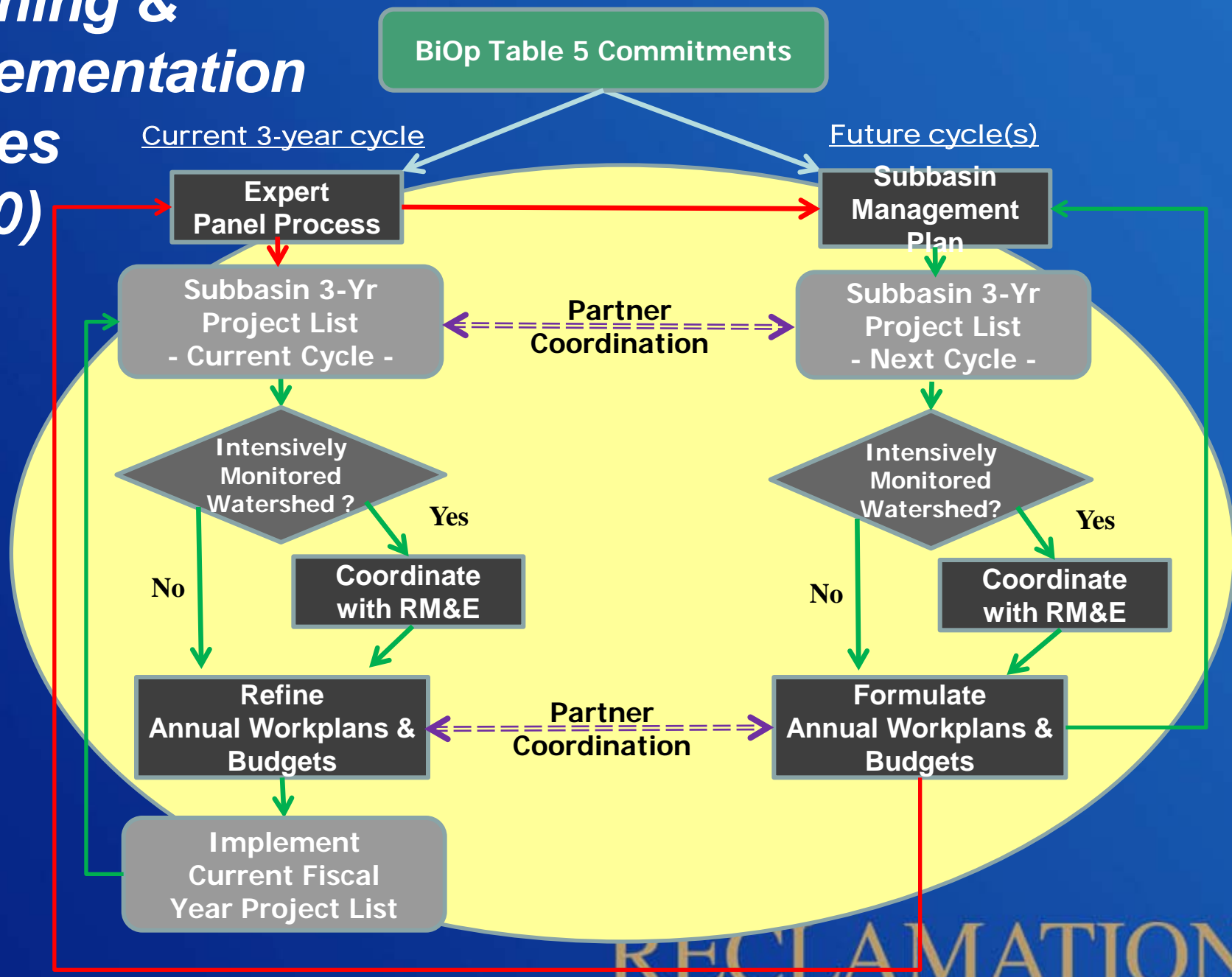
Acronym

- AS
- DOE
- ED
- HWS
- IS
- ISEMP
- IT
- LE
- M&DM
- NMFS
- OBMEP
- PUD
- RTT
- SRFS
- Tetra
- UCSRB
- USBR
- USFS
- USFWS
- WAT
- WDFW
- YN

Generalized Implementation Cycle (2009)



Planning & Implementation Cycles (2010)

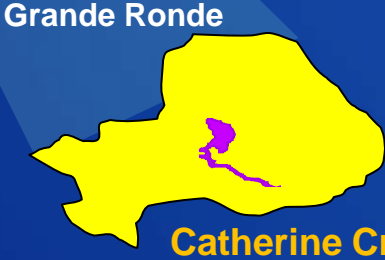
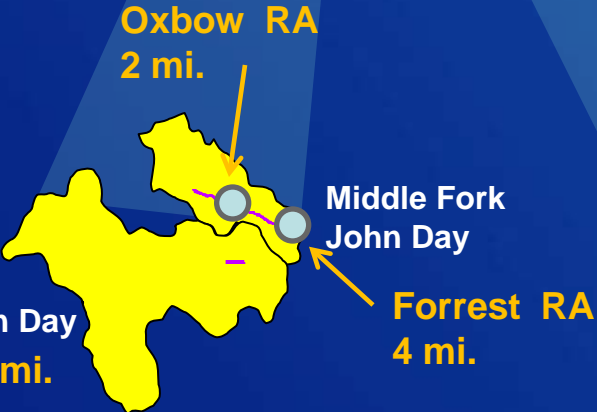
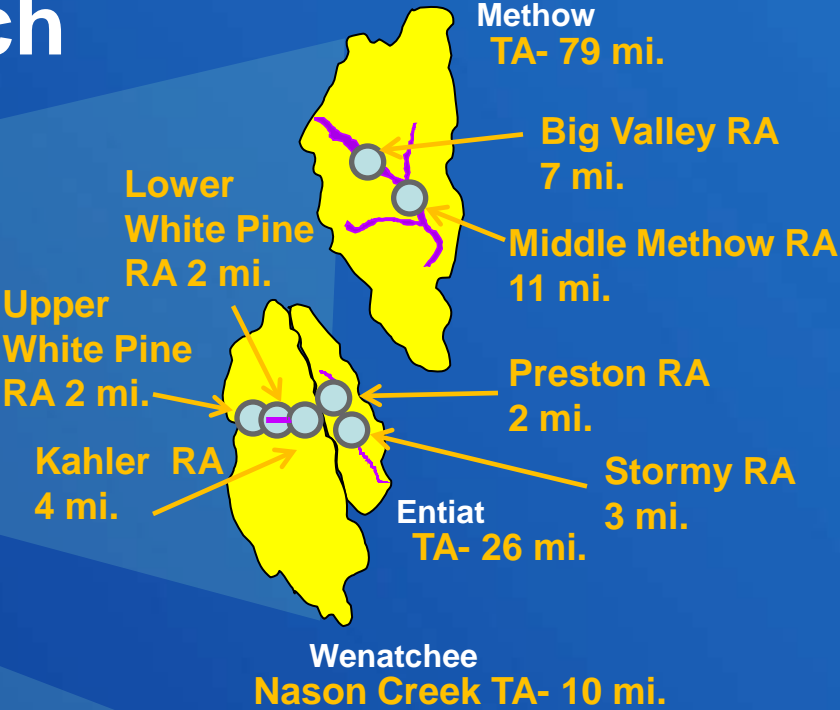
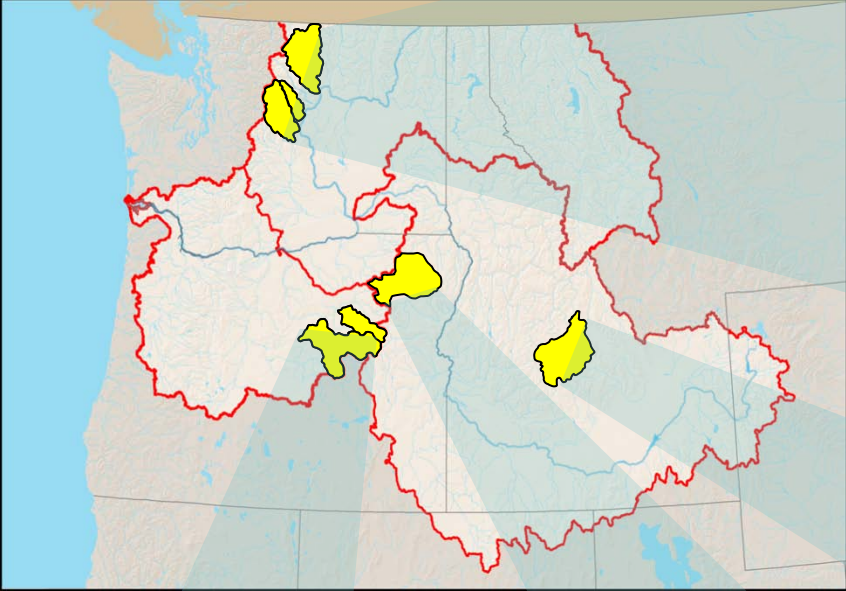


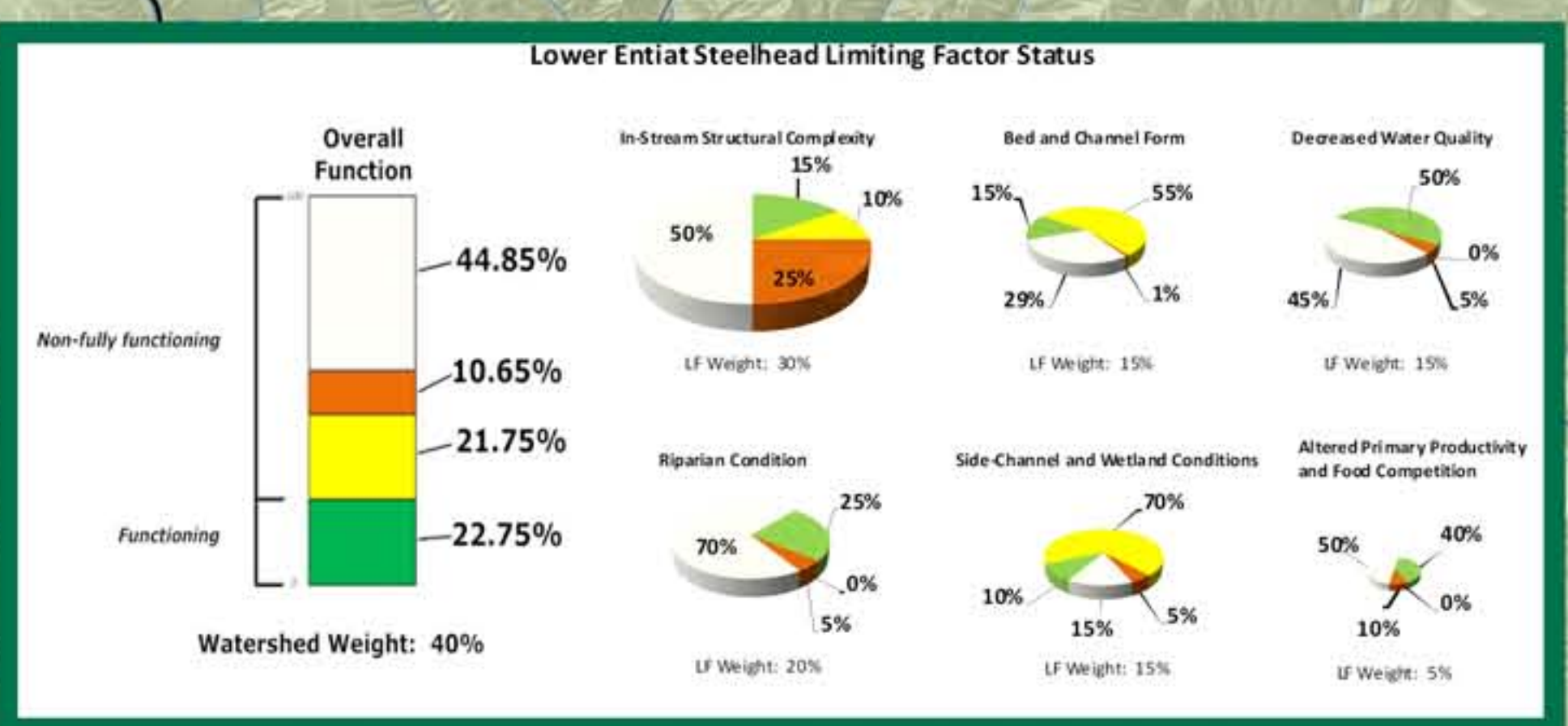
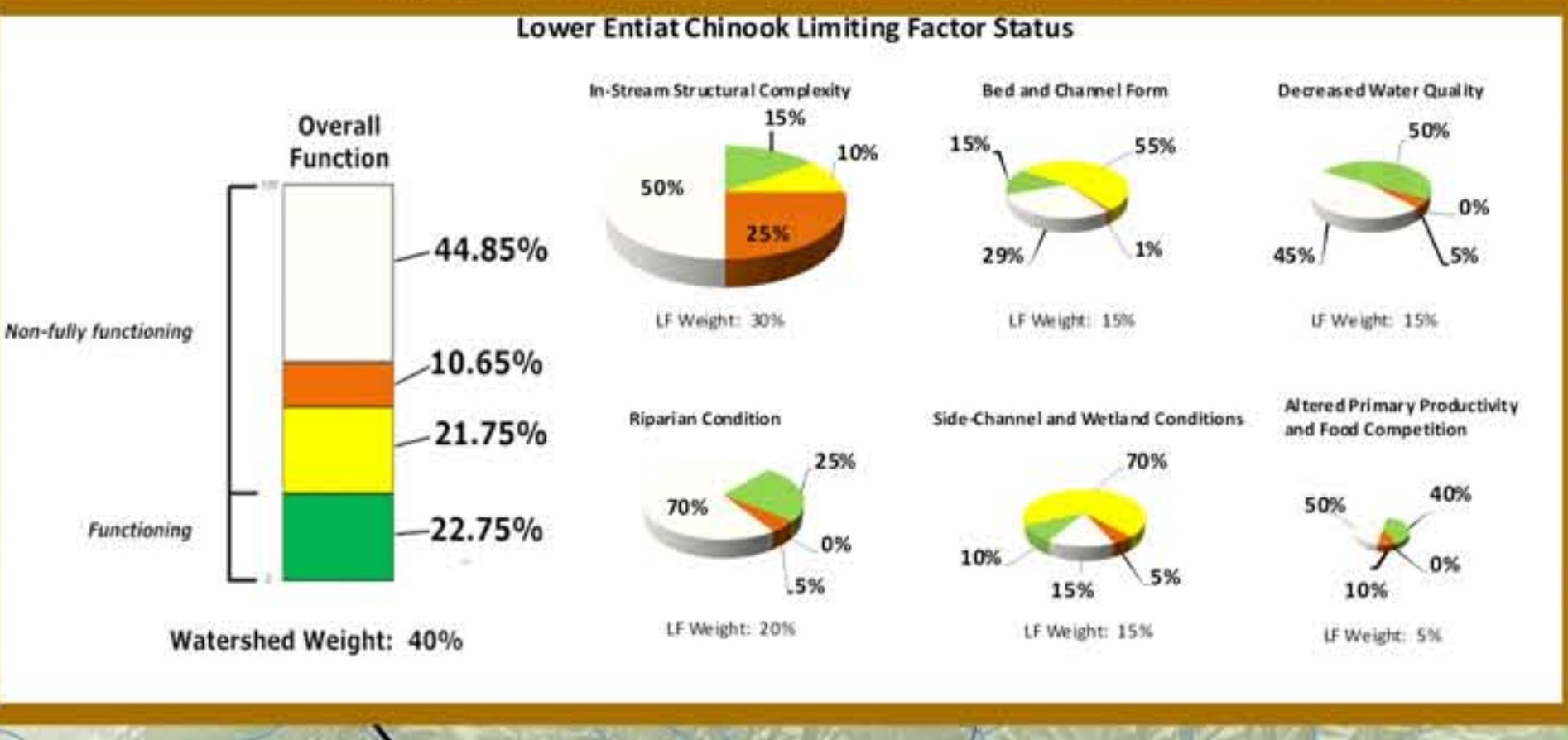
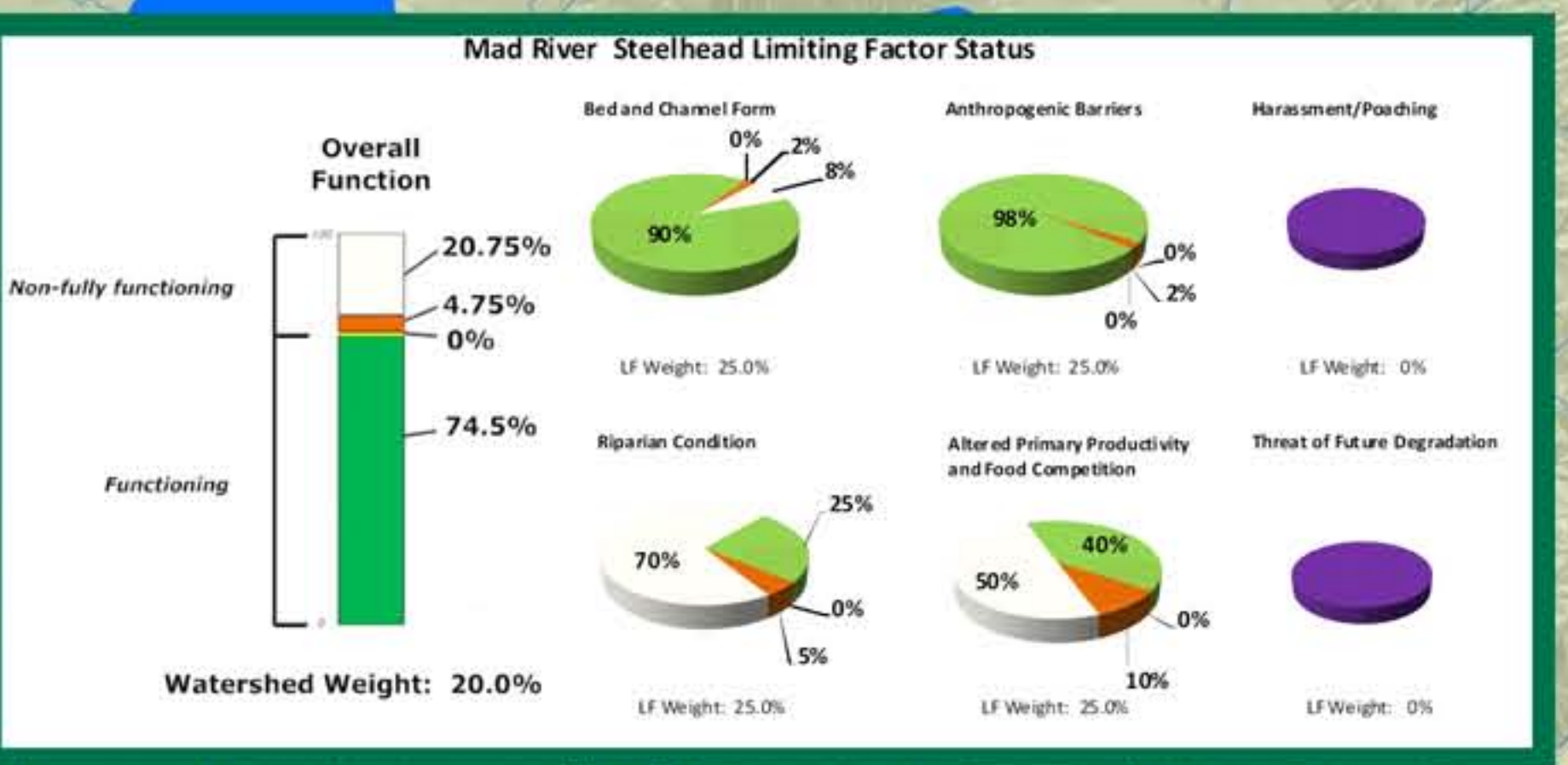
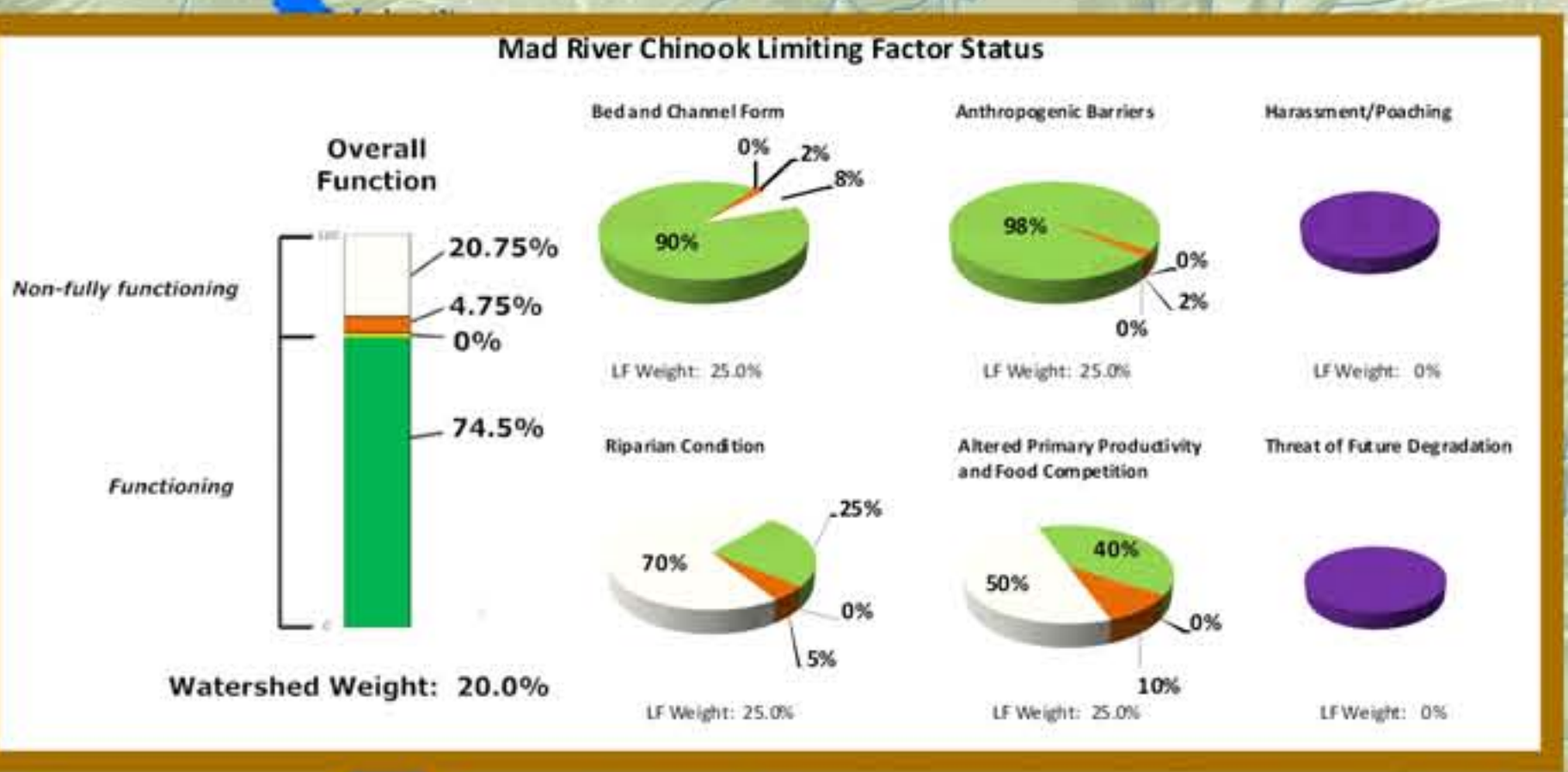
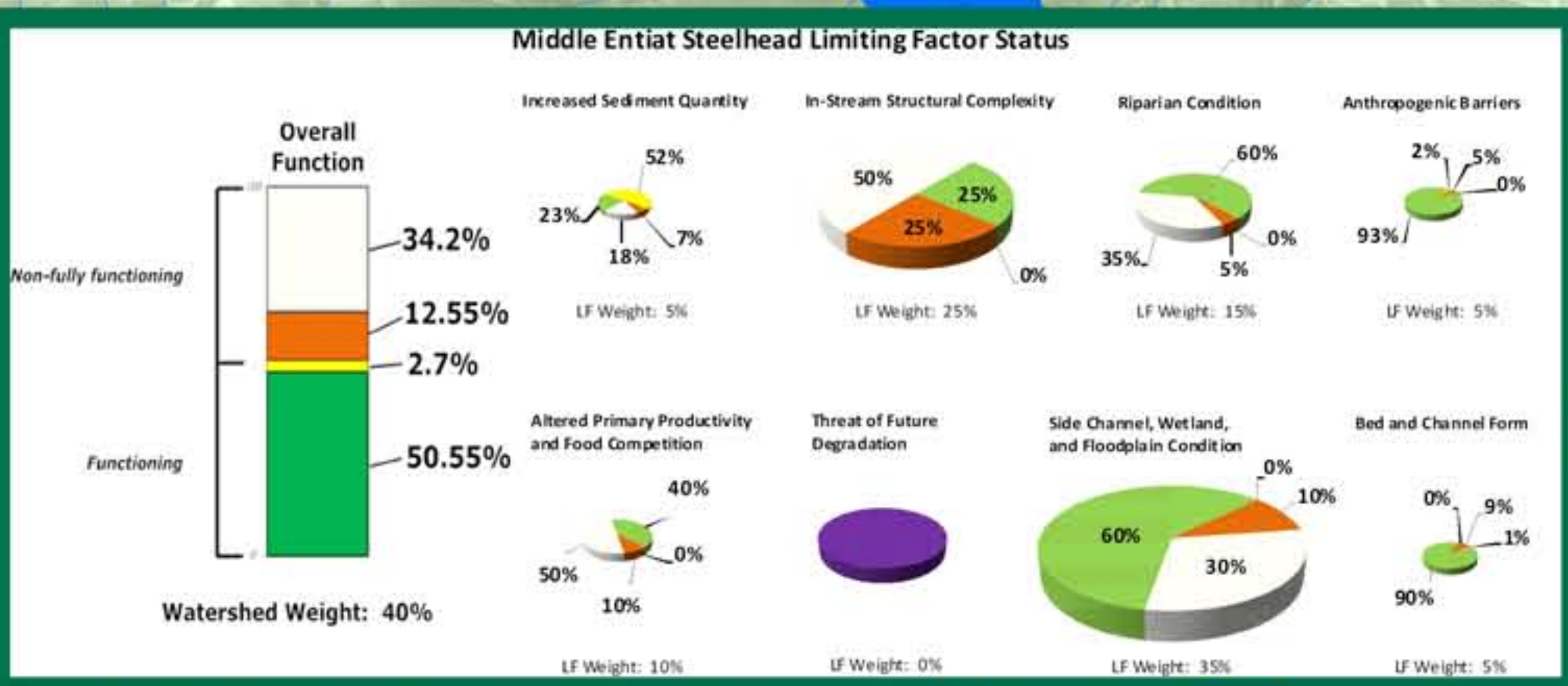
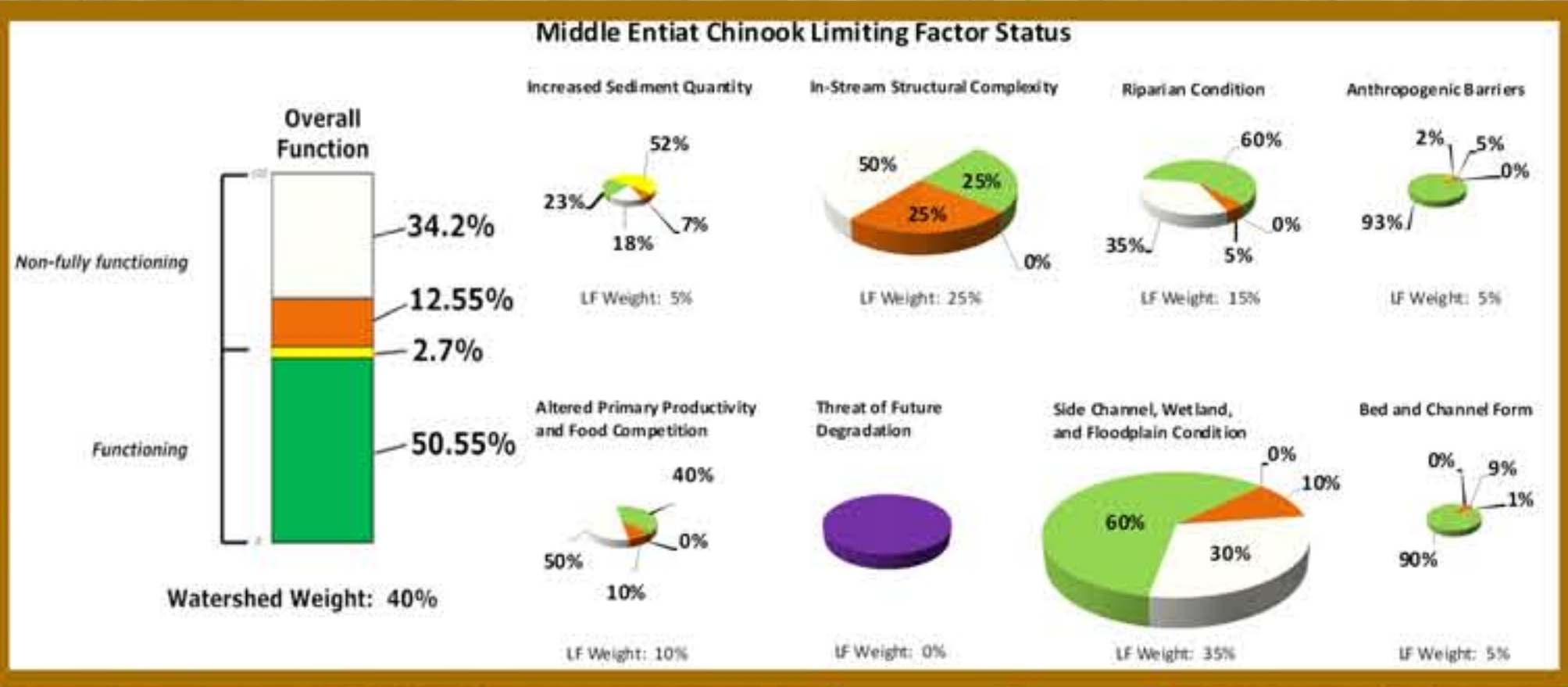
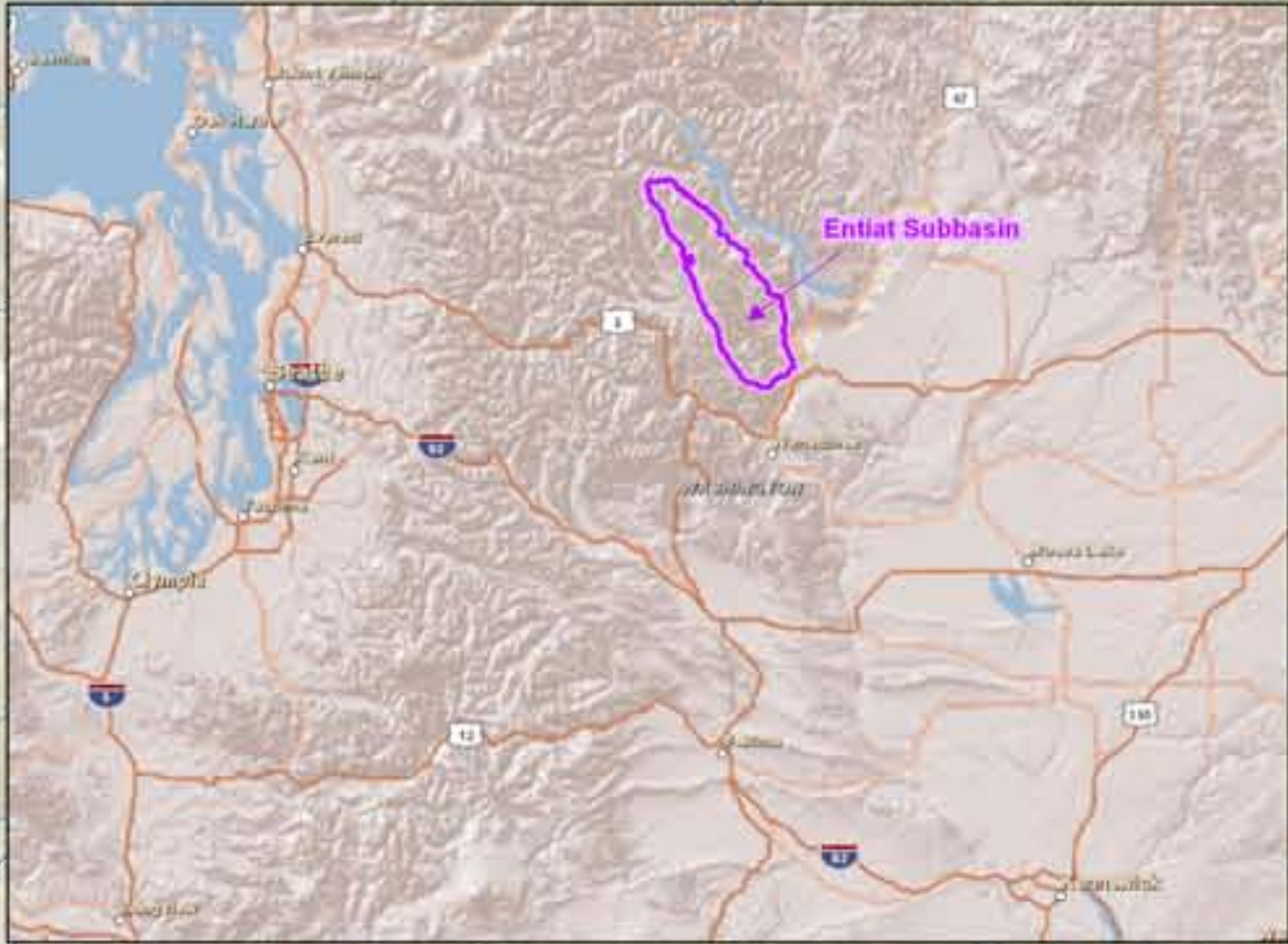
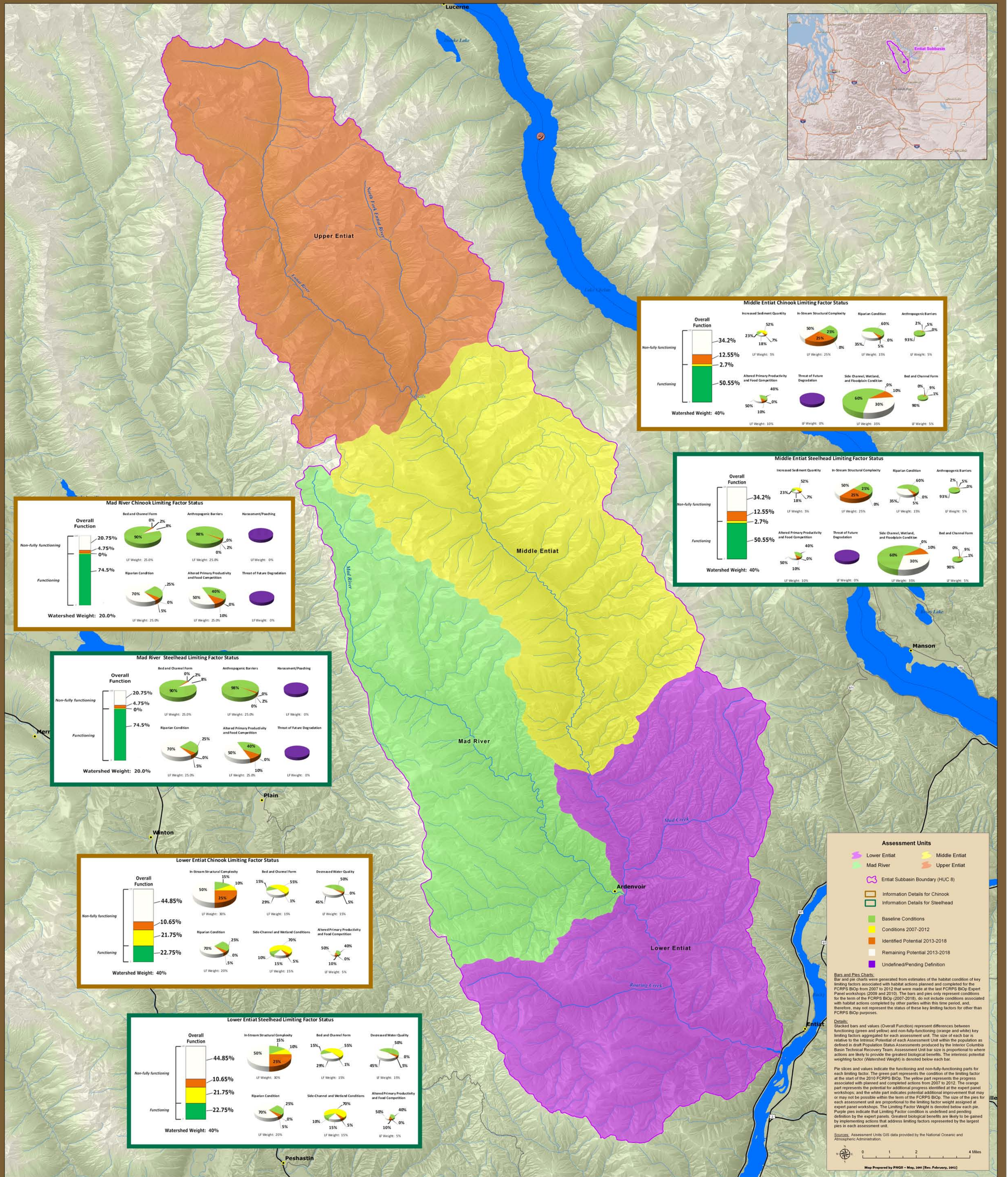
Integration

- Tributary and Reach Assessments
- Limiting Factor Pie Maps



USBR Tributary and Reach Assessments, 2012





Assessment Units

- Lower Entiat
- Middle Entiat
- Mad River
- Upper Entiat

Entiat Subbasin Boundary (HUC 8)

Information Details for Chinook

Information Details for Steelhead

Baseline Conditions

Conditions 2007-2012

Identified Potential 2013-2018

Remaining Potential 2013-2018

Undefined/Pending Definition

Bars and Pies Charts:
Bar and pie charts were generated from estimates of the habitat condition of key limiting factors associated with habitat actions planned and completed for the FCRPS BiOp from 2007 to 2012 that were made at the last FCRPS BiOp Expert Panel workshops (2009 and 2010). The bars and pies only represent conditions for the Intrinsic Potential of each Assessment Unit within the population as defined in draft Population Status Assessments produced by the Interior Columbia Basin Technical Recovery Team. Assessment Unit bar size is proportional to where actions are likely to provide the greatest biological benefits. The intrinsic potential weighting factor (Watershed Weight) is denoted below each bar.

Details:
Stacked bars and values (Overall Function) represent differences between functioning (green and yellow) and non-fully-functioning (orange and white) key limiting factors aggregated for each assessment unit. The size of each bar is relative to the Intrinsic Potential of each Assessment Unit within the population as defined in draft Population Status Assessments produced by the Interior Columbia Basin Technical Recovery Team. Assessment Unit bar size is proportional to where actions are likely to provide the greatest biological benefits. The intrinsic potential weighting factor (Watershed Weight) is denoted below each bar. Pie slices and values indicate the functioning and non-fully-functioning parts for each limiting factor. The green part represents the conditions of the limiting factor at the start of the 2010 FCRPS BiOp. The yellow part represents the progress associated with planned and completed actions from 2007 to 2012. The orange part represents the potential for additional progress identified at the expert panel workshops, and the white part indicates potential additional improvement that may or may not be possible within the term of the FCRPS BiOp. The size of the pie for each assessment unit are proportional to the limiting factor weight assigned at expert panel workshops. The Limiting Factor Weight is denoted below each pie. Purple pies indicate that Limiting Factor condition is undefined and pending definition by the expert panels. Greatest biological benefits are likely to be gained by implementing actions that address limiting factors represented by the largest pies in each assessment unit.

Sources: Assessment Units GIS data provided by the National Oceanic and Atmospheric Administration.

Map Prepared by PHGCI - May, 2011 (Rev. February, 2012)

Summary

- **FCRPS BiOp contains hydro-hatchery-predation-estuary and tributary habitat- and RME action requirements that cumulatively offset adverse effects to ESA- listed salmon and steelhead associated with operation and maintenance of the FCRPS**
- **FCRPS BiOp tributary habitat requirements involve regional review and evaluation through the Expert Panel process on three-year cycles of tributary habitat improvement actions that receive AA funding or technical assistance**
- **Regional partners are incorporating new tools and information to refine the approach for planning, funding, implementing, and evaluating habitat improvement actions that focus on the most important limiting factors in areas that provide the greatest benefits to ESA-listed salmon and steelhead**