

HABITAT IMPROVEMENT PROGRAM HIPIII 2018 ANNUAL MONITORING REPORT

Bonneville
POWER ADMINISTRATION



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SUMMARY

This is the fifth and likely final annual monitoring report required under the Habitat Improvement Program III Biological Opinions (HIPIII) (NMFS No# 2013/9724, USFWS 01E0FWOO-2013-F-0199) before the HIP4 is released. This report summarizes activities completed in calendar year 2018 and reports on the incidental take resulting from those activities and compares them with previous years.

Annually, BPA and partners (sponsors) implement substantial habitat enhancement work in the Columbia River basin to improve tributary habitat as “offsite” mitigation for the impacts the federal hydrosystem. Actions funded by Bonneville (BPA) are implemented through BPAs Habitat Strategy, which seeks to facilitate watershed-scale prioritization and planning efforts to identify priority work for fish habitat restoration. The program is one of the largest and most complex of its kind in the world and includes collaborative work with states, tribes, federal agencies, local governments and non-profit organizations to implement the most biologically beneficial actions in the highest priority areas for ESA-listed salmonids. The HIP is the primary means by which this habitat enhancement work gets reviewed, refined, and then covered under the ESA.

With the exception of turbidity, BPA has been successful in meeting incidental take criteria. The nature the restoration work often requires extensive swathes of exposed earth coming into contact with water. As a result, turbidity does not go within background levels within 2 hours. The number of BPA funded projects, scope and complexity remained consistent with previous years activities with the exception of herbicides. In addition to a diverse portfolio of projects, project quality assurance and quality control remain a priority. BPA continues to improve internal capacity to deliver high quality projects through optimizing and refining the RRT process. After nearly 4 years of experience, the HIP Review process has become streamlined and standardized based upon receiving feedback, re-evaluating failures, and capitalizing upon successes.

BPA now has 2 dedicated full time hydraulic engineers who provide a thorough and detailed technical review of all medium and high risk RRT projects. BPA EC leads are well trained in performing a separate functional review. NMFS habitat biologists continue to provide comments when they feel compelled to. Through these multi layered detailed project reviews, BPA can now exercise a higher level of discretionary authority on the type and quality of projects that it funds and shape their outcome.

The HIPIII Handbook continues to be refined and has been used as a tool to provide much needed clarifications, guidance and strives to reflect the current state of science on restoration standards and practice. BPA’s Fish and Wildlife Implementation group has adopted the HIPIII Handbook as official policy as to the types and methods of projects that shall receive BPA funding in the future and is well understood throughout the region.



2018014(Tucannon PA28)Before



2018014(Tucannon PA28)After

HIPIII PROJECTS AUTHORIZED

During 2018, the HIPIII BOs authorized 94 individual projects (Table 1, 2, & 3) (FIGURE 1&2) each with multiple activity categories (Work Elements) Work Elements are most discrete unit of action that BPA may undertake, with a contract consisting of multiple work elements and a project consisting of multiple contracts over time. For the sake of the HIPIII projects are mainly on the contract level. Figures 1&2 are overlain with USFWS field office and NMFS branch jurisdictions. A majority were low risk (67), 21 were medium risk, and 9 were high risk. Each medium and high risk underwent the HIP Review process which included a thorough technical review by BPA Engineering Technical Services (ETS).

TABLE 1: HIPIII PROJECT AUTHORIZATIONS (67 LOW RISK) 2018

HIP3 NO#	Project Title	Habitat Branch	Field Office
2018004	Grande Ronde Supplementation M&E 2017	CRB	La Grande
2018007	Protect Shillapoo Wildlife Area	WA/LCR	Lacey
2018009	Pahsimeroi River Habitat - Mulvaney Ditch Headgate Installation	S Snake	Chubbock
2018010	Asotin Creek Wildlife Mitigation O & M 2018	N Snake	Spokane
2018011	Hungry Horse Mitigation Habitat Restoration and RM&E	NA	Helena
2018012	Lemhi Hydrologic Monitoring	S Snake	Chubbock
2018013	Idaho Watershed Habitat Restoration	S Snake	Chubbock
2018016	Hellsgate Big Game Winter Refuge	CRB	Wenatchee
2018017	ODFW Operations & Maintenance	Willamette	Portland
2018018	Lemhi River Restoration	S Snake	Chubbock
2018019	Rainwater Wildlife Area	CRB	Spokane
2018020	Walla Walla Area Fish Screens I	S Snake	Spokane
2018021	Upper John Day Conservation Lands Program	CRB	La Grande
2018022	Tucannon PA-3 Helicopter Loading	N Snake	Spokane
2018023	Stabler Bend and Little Wind Planting	WA/LCR	Lacey
2018024	Pine Creek Conservation Area	CRB	NA
2018025	Sturgeon Lake (Dairy Creek) Restoration Project	WC/LCR	Portland
2018028	Walla Walla Area Fish Screens II	S Snake	Spokane
2018030	Lemhi River Restoration Hydroseeding and Weed Treatments	S Snake	Chubbock
2018031	Pahsimeroi River Habitat - Weed Treatment	S Snake	Chubbock
2018037	Rock Creek Fish and Habitat Project	CRB	NA
2018038	Caribou Parke Creek Pump Station	CRB	Wenatchee
2018039	Crow Creek/WF Pine Creek Krebs	S Snake	La Grande
2018040	NE Oregon Precious Lands Wildlife Area	S Snake	La Grande
2018041	Lemhi River Restoration - Little Springs	S Snake	Chubbock
2018042	Wallacut River Confluence Restoration	WA/LCR	NA
2018043	Kerry Island Restoration - Follow Up Weed Treatment	WA/LCR	Portland
2018044	Lemhi River Restoration - Hawley Creek Stockwater	S Snake	Chubbock
2018045	ODFW Fish Screens - Low Risk Projects I	CRB	La Grande
2018046	Hungry Horse Mitigation/Flathead Lake Habitat Restoration and RM&E	NA	Helena

HIP3 NO#	Project Title	Habitat Branch	Field Office
2018049	Umatilla Fish Passage O & M	CRB	La Grande
2018051	Pacific Lamprey Conservation Initiative	CRB	Portland
2018052	Sagebrush Flat Wildlife Mitigation	NA	Wenatchee
2018055	BPA Action Effectiveness Monitoring	CRB	Wenatchee
2018058	Cowiche Creek - NYCD Fish Screen	CRB	Wenatchee
2018064	Nora Creek Meadow Restoration	N Snake	NA
2018070	PA 24 & PA 26 Maintenance	N Snake	Spokane
2018071	Lower Clearwater and Potlatch Watershed - Riparian Plantings	N Snake	NA
2018072	Bear Creek Juniper Treatment	CRB	La Grande
2018074	Idaho Watershed Habitat Restoration II	S Snake	Chubbock
2018075	Hungry Horse Mitigation Habitat Restoration and RM&E II	NA	Helena
2018078	Umatilla Anadromous Fish	CRB	La Grande
2018079	Lapwai Creek Watershed Restoration I	N Snake	NA
2018080	Yakima Basin Side Channels	CRB	Wenatchee
2018081	Wenas Wildlife Area	CRB	Wenatchee
2018084	Little Sawmill Creek Restoration Project: Irrigation and Stock Water	S Snake	Chubbock
2018086	Gail Achterman Phase I	Willamette	Portland
2018087	Yakima Basin Side Channels	CRB	Wenatchee
2018088	Long Creek Neal Habitat Project- Plantings	CRB	La Grande
2018090	L-03AO Fish Screen Replacement	S Snake	Chubbock
2018094	Pahsimeroi River Habitat	S Snake	Boise
2018095	Elochoman 2 & 3 Restoration - Weed Treatments	WA/LCR	Portland
2018096	IDFG Fish Screen Projects	S Snake	Chubbock
2018097	Fifteenmile Creek Habitat Improvement	CRB	NA
2018099	ODFW Fish Screens - Low Risk Projects II	CRB	La Grande
2018100	Little Naneum Fish Screen Installation - Rixinger	CRB	Wenatchee
2018101	M2 WDFW Flow Connection	CRB	Wenatchee
2018102	Yakima Phase II Fish Screens O&M with WDFW	CRB	Wenatchee
2018103	Lonerock Ridge Juniper Burn	CRB	La Grande
2018104	Asotin County Watershed Habitat Enhance and Restore	S Snake	Spokane
2018105	ODFW Fish Screens Projects O & M	CRB	Portland
2018106	ODFW Fish Screens - Low Risk Projects III	CRB	La Grande
2018108	John Day Habitat Enhancement	CRB	La Grande
2018109	Grande Ronde Subbasin Restoration Weed Treatments 18	CRB	La Grande
2018110	Isquulktppe Watershed Project 18	CRB	NA
2018111	Willamette Mission Reforestation Phase 4	Willamette	NA
2018112	Sunnyside Wildlife Mitigation	CRB	Wenatchee
2018113	Trout Creek Watershed Restoration	CRB	NA

TABLE 2: HIPIII PROJECT AUTHORIZATIONS (21 MEDIUM RISK) 2018

HIP3 NO#	Project Title	Habitat Branch	Field Office
2018005	Umatilla Anadromous Fish Habitat with ODFW	CRB	NA
2018014	Tucannon Habitat Programmatic PA-28 Phase III	N Snake	Spokane

HIP3 NO#	Project Title	Habitat Branch	Field Office
2018026	South Scappose Creek Restoration Project	WA/LCR	Portland
2018034	Nason Creek 2.3 Restoration Project	CRB	Wenatchee
2018035	Brownell Dam Removal	CRB	La Grande
2018047	South Bachelor Island Fish Habitat Restoration	WA/LCR	Lacey
2018050	Big Meadow Culvert - Baffles Project	N Snake	NA
2018053	North Fork Habitat Improvement: Arbon & Barton	N Snake	Boise
2018057	Bear Mary's Ferrie Creeks Restoration	WA/LCR	Portland
2018062	Peshastin 2.7	CRB	Wenatchee
2018065	Big Meadow Creek Culverts Fish Passage Restoration	N Snake	NA
2018066	Klickitat Watershed Enhancement - Tepe Creek	CRB	Wenatchee
2018073	Pahsimeroi River Restoration on IDL & O'Neal Property	S Snake	Chubbock
2018082	Johnson Creek Diversion	CRB	NA
2018083	Grande Ronde Umatilla Fish Habitat Improvement	CRB	La Grande
2018085	Lapwai Creek Watershed Restoration II	N Snake	NA
2018091	Beaver Creek 2.6	CRB	Wenatchee
2018092	Pine Creek Conservation Area -Beaver Dam Analogs	CRB	NA
2018093	Shell Rock Point	CRB	NA
2018098	Ahtanum Creek - Herke Fish Screen & Riparian Enhancement	CRB	Wenatchee

TABLE 3: HIPIII PROJECT AUTHORIZATIONS (9 HIGH RISK) 2018

HIP3 NO#	Project Title	Habitat Branch	Field Office
2018001	John Day Tributary Passage and Flow - Fox Creek	CRB	NA
2018008	Eighteenmile Creek Restoration Beyeler – Phase 2	S Snake	Chubbock
2018027	Umatilla Anadromous Fish	CRB	La Grande
2018029	BirdTrack Springs Fish Habitat Restoration Project	CRB	La Grande
2018033	Rock Creek Fish Habitat Enhancement Project Phase III	CRB	La Grande
2018054	Little Sawmill Creek Restoration Project	S Snake	Chubbock
2018059	Aiwohi Dry Creek Fish Habitat Restoration	S Snake	NA
2018063	South Fork Walla Walla River - Hutchison Project	CRB	La Grande
2018077	Big Springs Restoration Phase II	S Snake	Chubbock

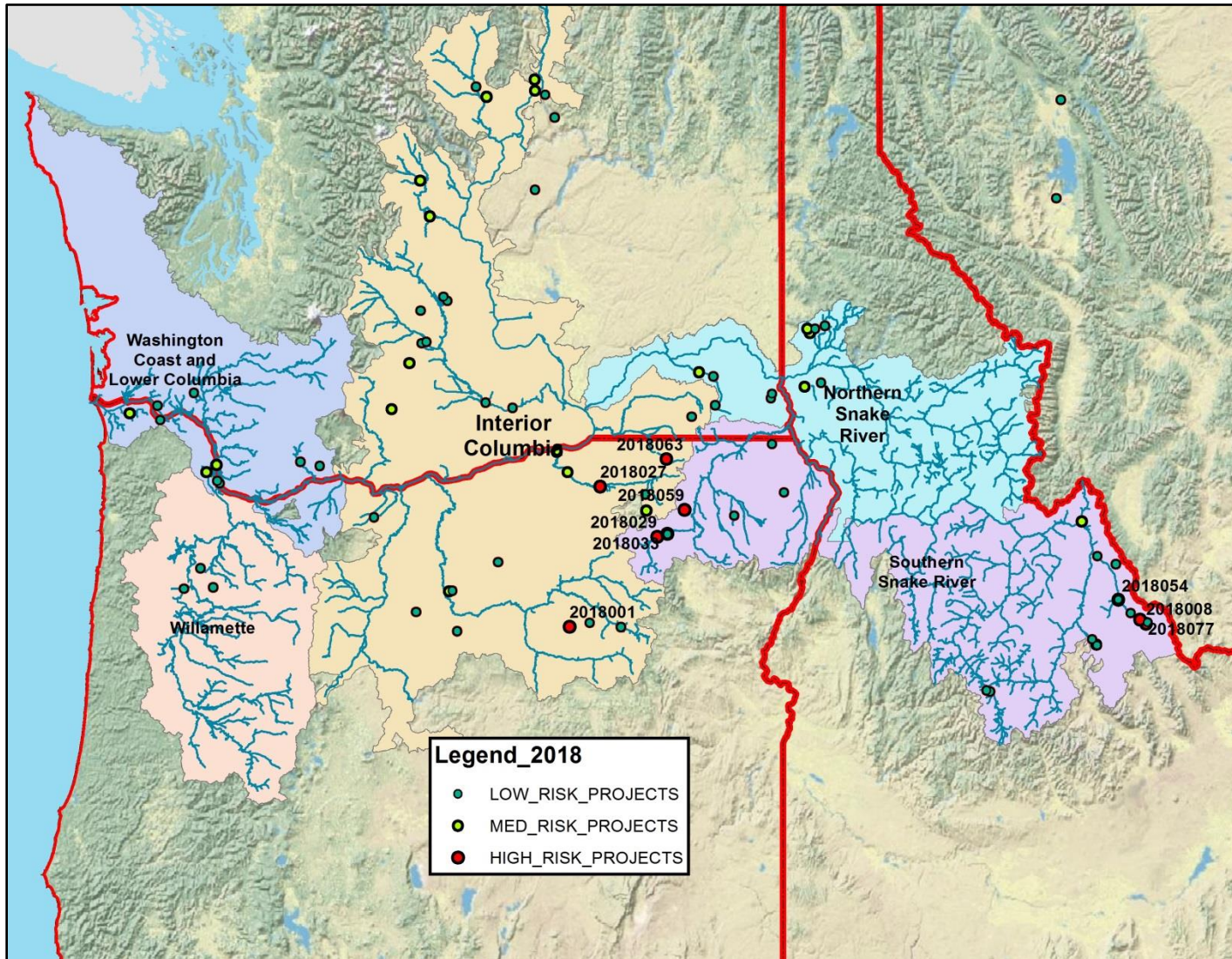


FIGURE 1: 2018 HIPIII PROJECT LOCATIONS (NMFS)

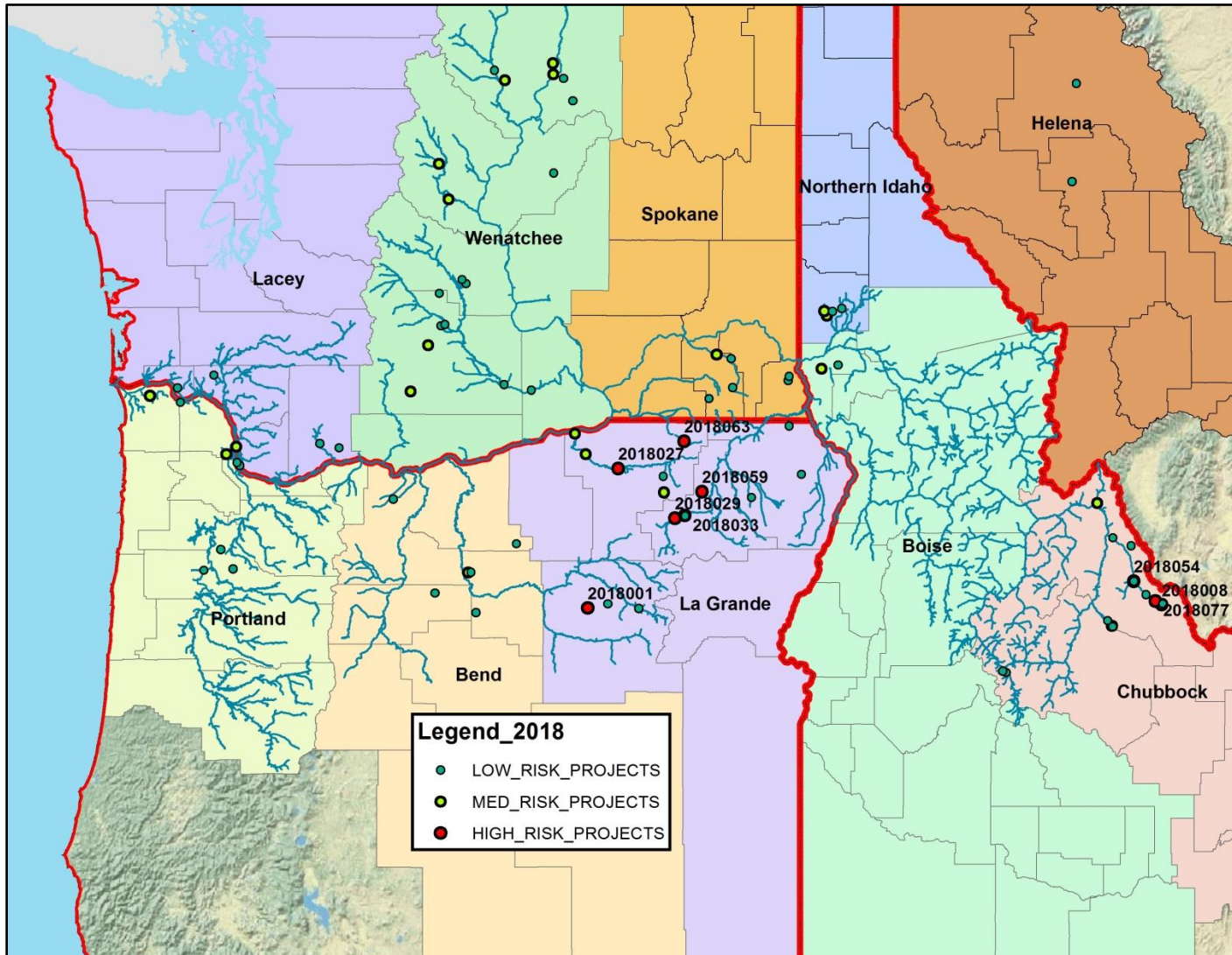


FIGURE 2: 2018 HIPIII PROJECT LOCATIONS (USFWS)



2018022(Tucannon PA3)Helicopter>Loading_Before



2018022(Tucannon PA3) Helicopter>Loading_After

PROJECT ACTIVITIES

Within each individual project there could be few or many activity categories. BPA generally lumps each set of activity categories by location and project sponsor, with the exception of herbicides, surveys, and O&M activities which could have multiple locations lumped by program.

The project activity categories are typical from previous years, with the exception of Fish Screen installations in which the Oregon Department of Fish and Wildlife used the HIP III for coverage instead of previously using the Mitchell Act Coverage (Table 3).

TABLE 3: PROJECT ACTIVITIES

Category	Subcategory	13	14	15	16	17	18
1. Fish Passage Restoration							
	a. Dams, Water Control or Legacy Structure Removal.	1	2	3	2	5	3
	b. Consolidate, or Replace Existing Irrigation Diversions.	3	3	1	0	5	4
	c. Headcut and Grade Stabilization.	3	6	9	9	9	4
	d. Low Flow Consolidation.	0	0	0	0	0	1
	e. Providing Fish Passage at an Existing Facility.	2	6	4	2	4	5
	f. Bridge and Culvert Removal or Replacement.	8	11	9	11	6	4
	g. Bridge and Culvert Maintenance.	0	0	1	0	1	0
	h. Installation of Fords.	2	0	2	0	1	2
2. River, Stream, Floodplain, and Wetland Restoration.							
	a. Improve Secondary Channel and Wetland Habitats.	6	11	8	12	17	19
	b. Set-back or Removal of Existing, Berms, Dikes, and Levees.	2	7	10	5	7	8
	c. Protect Streambanks Using Bioengineering Methods.	4	8	10	7	7	11
	d. Install Habitat-Forming Natural Material Instream Structures	11	20	15	20	25	29
	e. Riparian Vegetation Planting.	19	30	32	33	38	42
	f. Channel Reconstruction.	2	4	3	4	6	9
3. Invasive and Non-Native Plant Control.							
	a. Manage Vegetation using Physical Controls.	18	32	26	25	27	35
	b. Manage Vegetation using Herbicides.	39	45	39	28	29	37
4. Piling Removal.							
	Pile Removal	0	0	0	1	0	2
5. Road and Trail Erosion Control, Maintenance, and Decommissioning.							
	a. Maintain Roads.	2	4	3	2	2	4
	b. Decommission Roads.	0	3	0	0	2	2
6. In-channel Nutrient Enhancement.							
	Nutrient Enhancement.	0	0	0	0	0	0
7. Irrigation and Water Delivery/Management Actions.							
	a. Convert Delivery System to Drip or Sprinkler Irrigation.	1	2	2	1	1	4

Category	Subcategory	13	14	15	16	17	18
	b. Convert Water Conveyance from Open Ditch to Pipeline or Line	1	5	1	1	3	3
	c. Convert from Instream Diversions to Groundwater Wells for	0	0	0	0	0	1
	d. Install or Replace Return Flow Cooling Systems.	1	0	0	1	0	0
	e. Install Irrigation Water Siphon Beneath Waterway.	2	0	0	2	1	0
	f. Livestock Watering Facilities.	4	8	5	1	4	4
	g. Install New or Upgrade/Maintain Existing Fish Screens.	3	4	5	23	737	775
8. Fisheries, Hydrologic, and Geomorphologic Surveys.							
	Surveys	18	25	24	23	16	23
9. Special Actions (for Terrestrial Species).							
	a. Install/develop Wildlife Structures.	0	0	0	1	1	1
	b. Fencing construction for Livestock Control	1	5	7	7	14	13
	c. Implement Erosion Control Practices.	0	3	2	0	6	6
	d. Plant Vegetation.	2	6	7	6	14	18
	e. Tree Removal for LW Projects.	0	3	1	3	3	6



2018022(Tucannon PA3) Helicopter_Loading

INCIDENTAL TAKE REPORTING

The NMFS and USFWS BOs defined four categories of incidental take based on the likelihood of adverse effects to ESA-listed species.

1. Short-term impacts to water quality (e.g., suspended sediment, temperature, dissolved oxygen demand and contaminants).
2. Short-term impacts to water quality (e.g., due to application of chemical herbicides).
3. Short-term decreases in function of physical habitat features (e.g. floodplain connectivity, Natural cover, riparian vegetation, instream flow, stream substrate, space, and safe passage conditions).
4. Juvenile fish handling and dewatering during work area isolation.

IMPACTS TO WATER QUALITY TRIGGER

A further threshold for reinitiating consultation is a visible increase in suspended sediment. In 2018 there were **3 reported instances** where turbidity was elevated above background for more than 2 monitoring intervals. Each instance involved water coming into contact with newly exposed earth during low flow events.

TABLE 4a: Turbidity Exceedence (2018001)

HIPIII NO#	PROJECT
<p>2018001 EXPLANATION</p>	<p>John Day Tributary Passage and Flow – Fox Creek Specific restoration actions include additions of large wood and beaver support structures in the stream channel, reconnection of relic channels to increase sinuosity, re-shaping of floodplain zones, and riparian planting and fencing. Installation of large and small wood structures resulted in releases of fine sediment which due to low flows did not dissipate after 3 monitoring intervals. Fox Creek is an old lakebed and soil is extremely fine with no rock substrate. It was reported that walking through the stream for fish salvages alone creates extensive turbidity. All HIP BMPs were in place including additional measures as needed (installing filter fabric on exposed areas). Turbidity in this area is reasonably likely to be unavoidable.</p>



2018001 Fox Creek Prior to Construction



2018001 Fox Creek During Low Flows



2018001 Fox Creek Structure Placement resulted in turbidity

TABLE 4b: Turbidity Exceedence (2018027)

HIPIII NO#	PROJECT
2018027	Umatilla Anadromous Fish – Meacham Creek Bonifer Reach
EXPLANATION	<p>The project design incorporated the following major elements: 1) reshaping of the floodplain and removal or modification of large spur dikes in the floodplain; 2) excavation of a new channel and side channels to move the stream into its historic channel alignment and meanders in the floodplain; 3) incorporation of in-stream habitat features in the new reconfigured channel and placement of large log and rock structures throughout the channel and floodplain; 4) removal of the existing protection levee along the existing channel. Generally, pollution and sediment control measures worked well across the large scale of the project. However, due to the extensive work that took place in one segment of stream, more extensive sediment controls had to be constructed to reduce turbidity to acceptable levels and prior to construction of adequate sediment control BMPs, turbidity did exceed HIP III standards for more than 3 monitoring intervals. However, work was stopped immediately after the exceedance was identified and more BMPs were put into place after turbidity had returned to background levels. After installing the appropriate BMPs, turbidity did not exceed HIP III standards again.</p>



2018027: Umatilla Anadromous Fish – Meacham Creek Bonifer Reach

TABLE 4c: Turbidity Exceedence (2018063)

HIPIII NO#	PROJECT
<p>2018063 EXPLANATION</p>	<p>South Fork Walla Walla River – Hutchinson Project Construction work included significant floodplain, alcove, and side channel excavation; and installation of LWD structures, habitat boulders and roughened riffles. Turbidity was minimized and within criteria during construction. Following completion of side channel inlet area work, activation of side channels included pre-washing new side channels, pumping the turbid water to an approved floodplain location with no turbid water returns to the river, and incrementally increasing flow in the new side channels over a period of 3 of 6 hours. Despite this rewating plan, due to the extensive amount of newly excavated surfaces, suspended sediment entered into the SF Walla Walla and was limited to the right bank for <200m downstream and then was rapidly dissipated.</p>



2018063 – Hutchinson Project – Extensive earthwork



2018063 – Hutchinson Project – Extensive earthwork



2018063 – Hutchinson Project – Turbidity entering SF Walla Walla River

DECREASE IN FUNCTION OF PHYSICAL HABITAT FEATURES TRIGGER

This was defined as the total length of stream reach that is modified by construction each year. 90 projects per year that include near or in-water construction is a threshold for reinitiating consultation. This has been met with 43 projects that required near or in-water construction in 2015. These sites are represented as the red dots on Figures 1 & 3.

TABLE 5: No# HIPIII PROJECTS THAT INCLUDE NEAR OR IN_WATER WORK

2013	2014	2015	2016	2017	2018
35	45	41	40	43	43

JUVENILE FISH HANDLING TRIGGER

Capture and/or mortality of ESA-listed salmonids during work area isolation is limited to 7500 captured and 375 injured or killed per calendar year. This is further broken down by recovery domain.

BPA has taken less fish than last year during work area isolation activities. It is worth noting that scope and complexity of BPA funded projects has been steadily increasing over the years thus requiring greater efforts at work area isolation (dewatering reaches for channel reconstruction).

TABLE 6: INCIDENTAL TAKE DUE TO FISH HANDLING

SPECIES	TAKE CATEGORY	ALLOWABLE LIMITS	2013 ACTUAL TAKE	2014 ACTUAL TAKE	2015 ACTUAL TAKE	2016 ACTUAL TAKE	2017 ACTUAL TAKE	2018 ACTUAL TAKE
Interior Columbia Willamette	Capture	5925	841	3593	3541	2435	2446	3282
	Mortality	296	12	8	59	130	78	189
Bull Trout	Capture	1200	0	0	0	0	0	26
	Mortality	60	0	0	0	0	0	0
Bull Trout	Capture	250	0	14	29	5	0	4
	Mortality	13	0	0	0	0	0	0



2018029 (BirdTrack Springs Habitat Restoration Project)Fish_Capture



2018033(Rock Creek)Boulder Placement

FISH MORTALITY

A majority of the fish mortality (150) occurred in one just project area in the John Day. This was not a restoration action but a fish rescue at an improperly functioning fish screen that was being maintained by ODFW who was receiving funding from BPA. BPA has contacted NMFS to verify if the HIP is the appropriate to count these fish under the HIP and received a positive confirmation on 4/24/19.

HIPIII NO#	PROJECT:
2018105	ODFW Fish Screen Projects
EXPLANATION	<p>John Day #12. (150 dead mykiss, 150 dead chinook, 14 mykiss returned alive) Fish are believed to have been downstream of the screen (upstream of screen is between screen and point of diversion) both from the screen being overtopped and fish swimming up the bottom end of the ditch. This screen replacement is in development.</p> <p>NOTE: John Day River Spring Chinook Salmon are not listed under the Endangered Species Act (ESA) and were not included in the final take numbers.</p>



2018035(Brownell Dam Removal)



2018035(Brownell Dam Removal)

APPROVED VARIANCES

In 2018, BPA requested 17 variances with the most common being inwater work window extensions and distance to staging areas. Most of the variances types are consistent with the variances requested for previous years with the exception of application of herbicides in the estuary which appears to be a new development.

In reviewing variance requests from all years, BPA requested an average of 18 variances a year which typically represented 50% of all proposed projects that require in water work. To remedy this, the HIP4 shall include language that will grant further flexibility to IWWW and staging area locations which will reduce the number and frequency of variances.

TABLE 7: NUMBER OF VARIANCES

	2014	2015	2016	2017	2018
Variations	19	20	18	16	17

TABLE 8: VARIANCE RATIONALE

HIP#	PROJECT	RATIONALE
2018007	Protect Shillapoo Wildlife Area	Use Vista adjuvant upland
2018008	Eighteenmile Creek Restoration Beyeler – Phase 2	IWWW Extension
2018025	Sturgeon Lake (Dairy Creek) Restoration Project	IWWW Extension
2018034	Nason Creek 2.3 Restoration Project	Staging Area <150
2018035	Brownell Dam Removal	Electrofishing Temperatures
2018042	Wallacut River Confluence Restoration	Estuarine Herbicide Application
2018043	Kerry Island Restoration - Follow Up Weed Treatment	Estuarine Herbicide Application
2018047	South Bachelor Island Fish Habitat Restoration	Placement of Sand
2018054	Little Sawmill Creek Restoration Project	IWWW Extension & Staging Area
2018057	Bear Mary's Ferrie Creeks Restoration	Staging Area <150

2018065	Big Meadow Creek Culverts Fish Passage Restoration	culvert with span <1.5 BFW
2018080	Yakima Basin Side Channels	Use of Chain (Previously Approved)
2018081	Wenas Wildlife Area	Use adjuvant upland
2018083	Grande Ronde Umatilla Fish Habitat Improvement	Electrofishing Temperatures
2018084	Little Sawmill Creek Restoration Project: Irrigation and Stock Water	IWWW Extension, unscreened POD
2018095	Elochoman 2 & 3 Restoration - Weed Treatments	Estuarine Herbicide Application
2018096	IDFG Fish Screen Projects	IWWW Extension



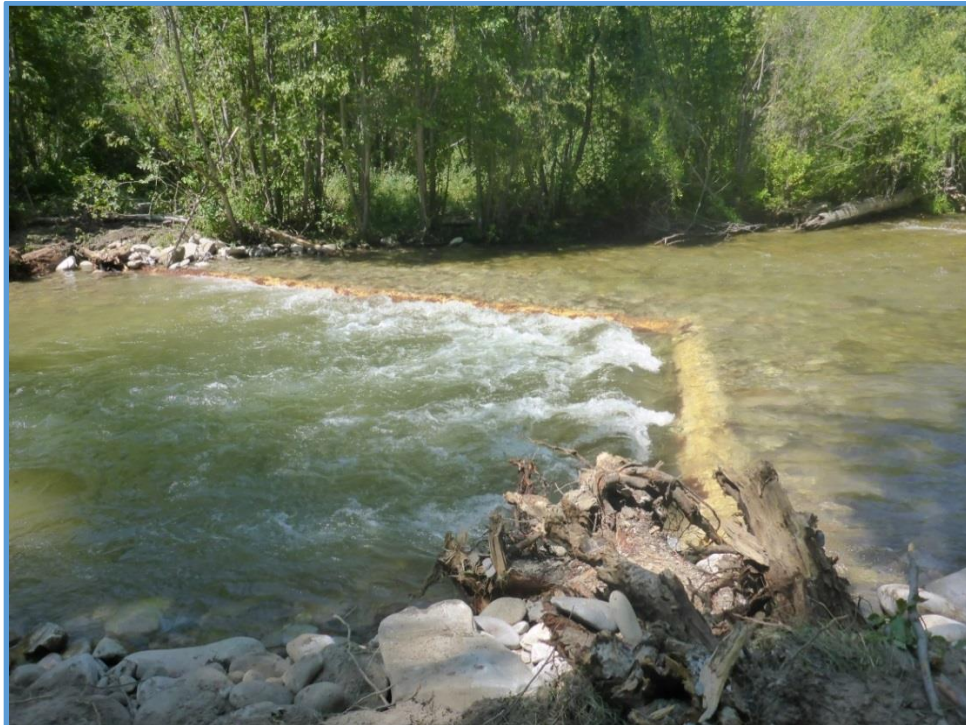
2018053(Arbon Barton)Wood Placement

NON COMPLIANCE

There were no known cases of non-compliance this year. We attribute this to the fact that BPA’s restoration partners (project sponsors) are typically the same year after year, and have been thoroughly trained in the use of the HIP, are familiarized with the HIP/III Handbook and aided by the in-depth technical reviews provided by BPA Engineering Technical Services.

TABLE 9: Reported Non Compliance Events

2013	2014	2015	2016	2017	2018
NA	6	2	1	0	0



2018053(Arbon Barton)Wood Weir

HERBICIDE USE

Herbicide use continues to be the most widely used project activity category under the HIP/III. This is due to the numerous wildlife mitigation areas that BPA purchases and are managed under contract by various entities. There has been an increased interest in using herbicides not covered under the HIP/III due to herbicide resistant weeds (upland use of Vista) and expanded applications within the estuary.

FIGURE 3: HERBICIDE APPLICATION (NMFS)

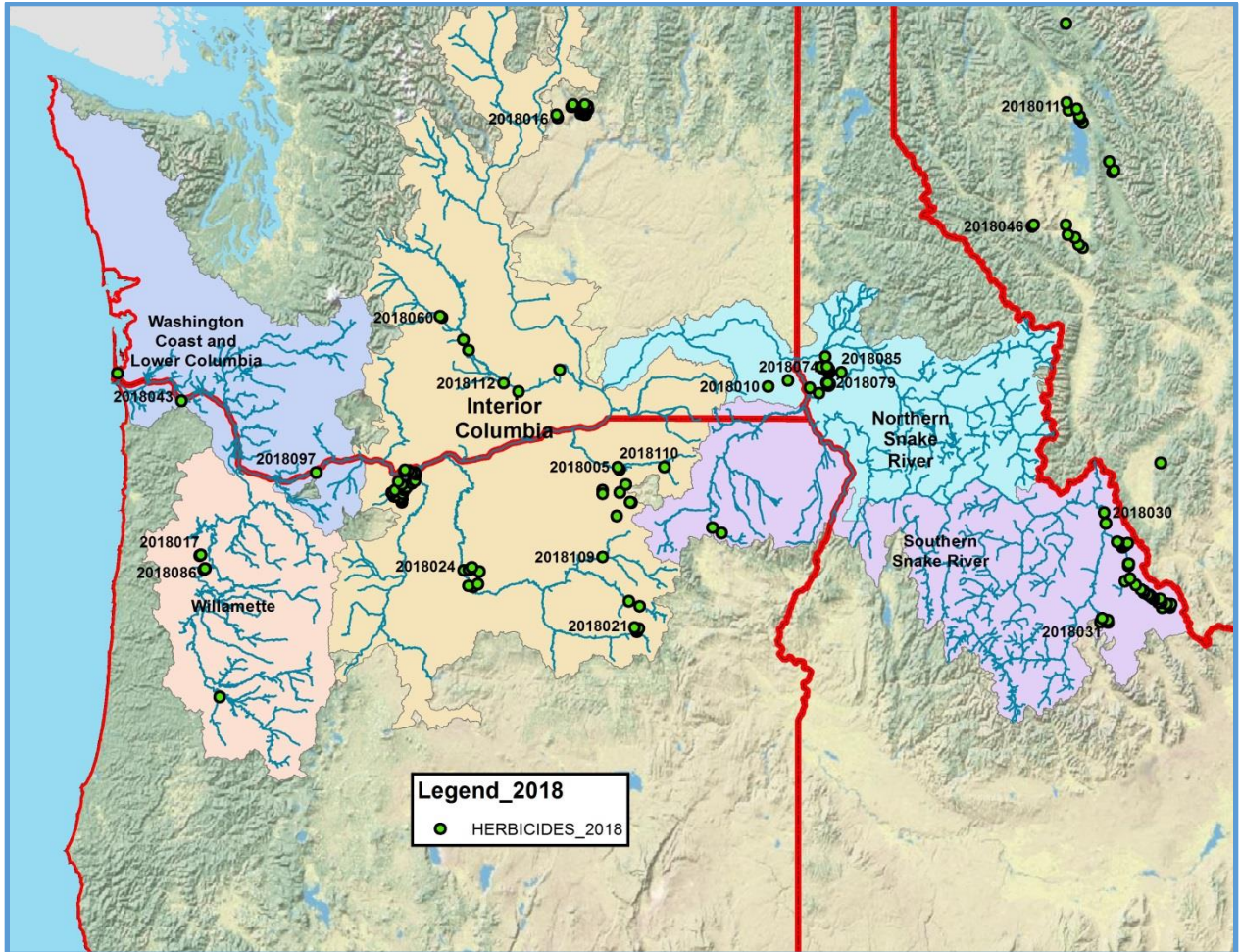
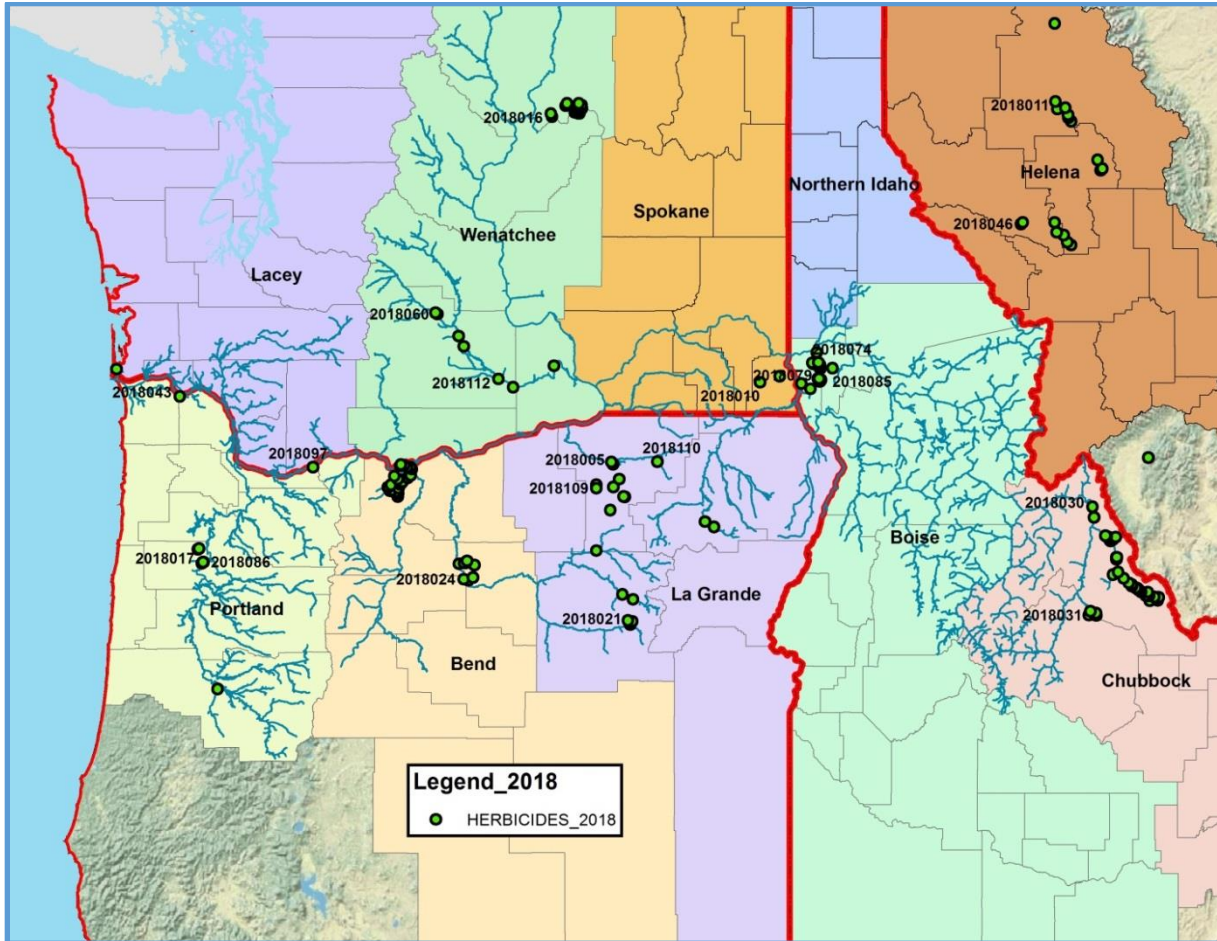


FIGURE 4: HERBICIDE APPLICATION (USFWS)



CHEMICAL HERBICIDE APPLICATION TRIGGER

The analysis in the BOs affirm that application of chemical herbicides will result in short-term degradation of water quality which will cause injury to fish in the form of sublethal adverse physiological effects. Up to 1,000 total riparian acres may be treated in a calendar year under this programmatic consultation.

In 2018, the amount of riparian acres treated has declined substantially. We hope that this trend continues as wildlife managers find effective alternatives to herbicide treatments.

TABLE 10: ACRES TREATED WITH HERBICIDE

	RIPARIAN	UPLAND
2013	409	2482
2014	449	8282
2015	715	7399
2016	836	8940
2017	831	5561
2018	533	2127

TABLE 11: PROJECTS WITH HERBICIDE USAGE

HIPIII NO#	PROJECT	RIPARIAN	UPLAND
2018005	Umatilla Anadromous Fish Habitat with ODFW	46.93	21.12
2018010	Asotin Creek Wildlife Mitigation O & M 2018	0	477
2018011	Hungry Horse Mitigation Habitat Restoration and RM&E	2.91	22.15
2018016	Hellsgate Big Game Winter Refuge	0	290.75
2018017	ODFW Operations & Maintenance	112	42.45
2018019	Rainwater Wildlife Area	20	69.3
2018021	Upper John Day Conservation Lands Program	7	89.2
2018024	Pine Creek Conservation Area	67.5	74.5
2018030	Lemhi River Restoration Hydroseeding and Weed Treatments	1.363	6.87
2018040	NE Oregon Precious Lands Wildlife Area	85	490
2018042	Wallacut River Confluence Restoration	0	0
2018043	Kerry Island Restoration - Follow Up Weed Treatment	29	4
2018079	Lapwai Creek Watershed Restoration I	0.76	41.68
2018081	Wenas Wildlife Area	15	357.3
2018085	Lapwai Creek Watershed Restoration II	4.6	0
2018086	Gail Achterman Phase I	0	195.25
2018095	Elochoman 2 & 3 Restoration - Weed Treatments	0	0
2018097	Fifteenmile Creek Habitat Improvement	92	23

2018102	Yakima Phase II Fish Screens O&M with WDFW	0.28	0
2018109	Grande Ronde Subbasin Restoration Weed Treatments 18	48.25	25.3
2018110	Isquultpe Watershed Project 18	0	39.3
2018111	Willamette Mission Reforestation Phase 4	0	86.5
2018112	Sunnyside Wildlife Mitigation	10	97
2018113	Trout Creek Watershed Restoration	5.25	32.25
2018019	Rainwater Wildlife Area	20	69.3



2018073(Pahsimeroi_River_Restoration_IDL)Wood_Placement_Before



2018073(Pahsimeroi_River_Restoration_IDL)Wood_Placement_During



2018073(Pahsimeroi_River_Restoration_IDL)Wood_Placement_After

ESTUARINE HERBICIDE ACTIONS

In spring of 2019, BPA received technical assistance from Dr Scott Hecht and Dr Nancy Munn of NMFS to explore options for herbicide application within the Estuary using proposed HIP4 conservation measures and methodologies as a baseline action and then refining the treatment with respect to the various estuarine zones (high marsh, low marsh and tidal flat/aquatic bed). Specific guidance with respect to type of herbicide applied, method of application, rate of application, frequency of treatment, timing of treatments, and the location and acreage of treatment area.

The following five projects were evaluated:

1. Lower Elochoman (Implemented HIP No# 2019040)
2. Elochoman 3 (Implemented HIP No# 2019041)
3. Kerry Island (**Not Implemented**)
4. Columbia Stock Ranch (Implemented HIP No# 2019043)
5. Wallacut Island (**Not Implemented**)

During the exchange, information needs were relayed to evaluate the action and direct communication was opened up with the sponsor Columbia Land Trust. Additional information was provided via site visits and a herbicide application memo (HAM). The HAM contained aerial site maps showing proposed activities and a Light Detection and Ranging (LIDAR) or another type of topographic map depicting site elevations.

The action was refined and constrained in order to fall within the range of effects of HIPIII. Of the five projects evaluated, Lower Elochoman, Elochoman 3 and Columbia Stock Ranch were implemented. The reason that Kerry Island and Wallacut were not able to move forward is due to the amount of low marsh treatment that was required for the herbicide projects that were proposed. After several conference calls with NMFS, they determined that the number of acres of low marsh treatment proposed in Kerry Island and Wallacut was too high considering the risk to herbicide entering surface waters within the Columbia River Estuary. Mechanical removal and high marsh and upland treatments were accepted by NMFS on those sites. However, the acreage of high marsh and upland areas on Kerry Island and Wallacut was too small to justify completing the work within those areas.

While not all projects were able to move forward, a process was created which will enable adequate review of herbicide application in the Estuary moving forward. This process is still being refined and will likely undergo changes in the future depending on workload and lessons learned.



2018077(Big Springs)Before



2018077(Big Springs)After

TENTATIVE ESTUARINE PROCESS

Guidelines for Review

Low Risk: All applications of herbicides in the uplands (>300 feet) or behind a berm or land feature that would preclude entry into surface waters, that adhere to all listed conservation measures.

Medium Risk: All applications of herbicides in the Estuary that deviate from the criteria.

High Risk: All applications of herbicides within low marsh or high marsh in the Estuary (CR below Bonneville Dam, including CR tributaries).

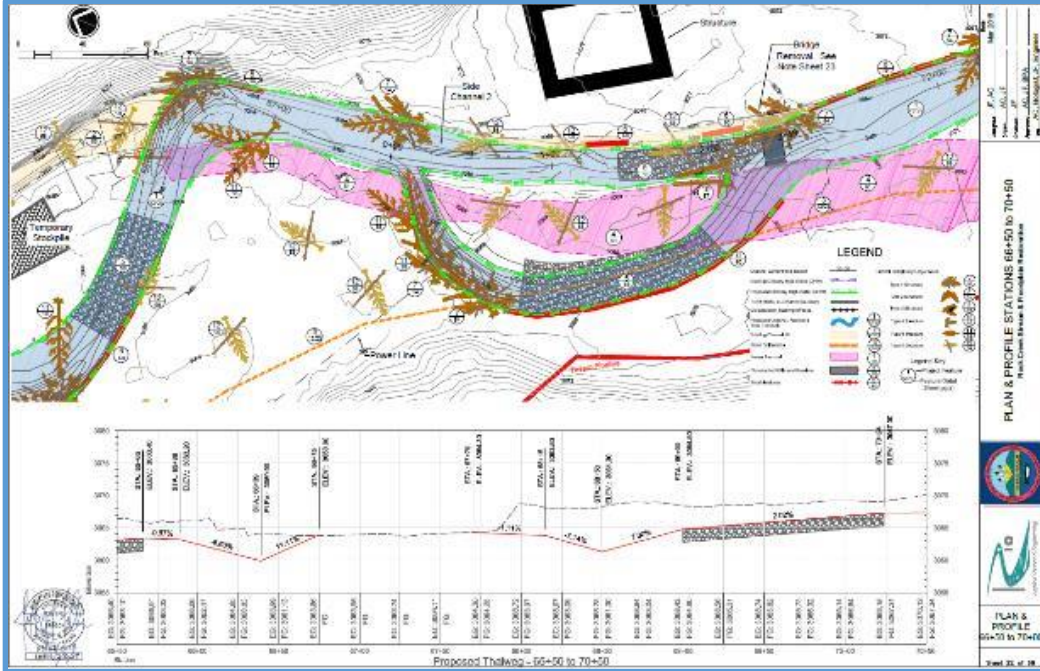
All medium to high risk Estuarine Herbicide projects shall require NMFS branch chief or workgroup approval. To facilitate this evaluation, an Herbicide Application Memo (HAM) shall be drafted that contains the following information:

- 1) Application methodology
- 2) Application Timing
- 3) Deviations from HIP4 conservation measures
- 4) Application areas in high, low marsh, tidal flats
- 5) Lidar and/or tidal/ water surface elevation inundation maps

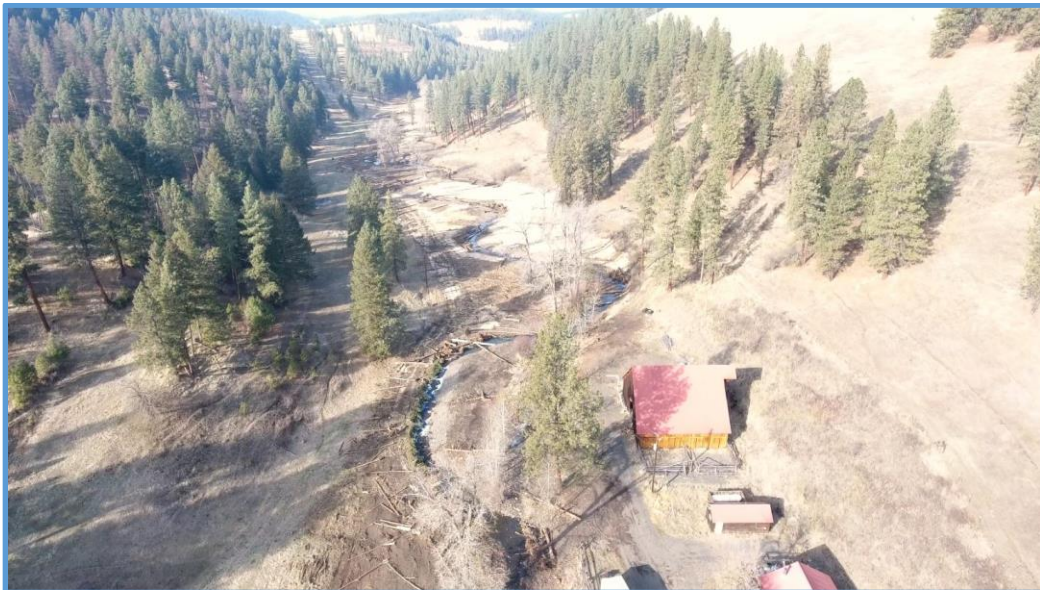
This memo shall be evaluated to confirm if the proposal is within the range of effects described in the HIP4 Biological Opinion, if not, additional conservation measures or restrictions may be prescribed that contain the action within the programmatic, or a formal individual consultation may be pursued. After the first year of implementation and with satisfactory process implementation, and upon approval of NMFS, HAMs shall not be needed for subsequent years.



2018029 (BirdTrack Springs Habitat Restoration Project)Planting



2018033(Rock_Creek)Plans.



2018033(Rock_Creek) Execution.

HIP REVIEW PROCESS (Refined)

Through the HIP Review process, BPA has been conducting thorough technical reviews of all medium and high risk projects. These technical reviews are conducted by a licensed PE and sometimes involve several iterations of back and forth review junctures between the project sponsors. Functional review is done by BPA staff (EC Lead) who review the project for adherence to HIP III criteria and coordinate information sharing and collaboration amongst project partners. Both of these reviews together constitute the HIP Review Process.

Project sponsors and other federal partners are actively engaged in the HIP Review process and are submitting projects early. BPA is receiving and reviewing projects that are to be implemented in 2020 and beyond.

TABLE 12: HIP REVIEW WORKLOAD

	FY13	FY14	FY15	FY16	FY17	FY18
Medium Risk	4	14	24	24	23	37
High Risk	2	6	2	3	5	14

2018 was a banner year for HIP Review process, the number of complex projects continues to increase and through BPA Engineering Technical Services, BPA has exerted a rigorous technical point of view, often getting sponsors to change designs. Thus ensuring substantial benefit to ESA-listed salmonids and their habitat.



2018013(Dillon_Bank_Restoration)_1



2018013(Dillon_Bank_Restoration)_2



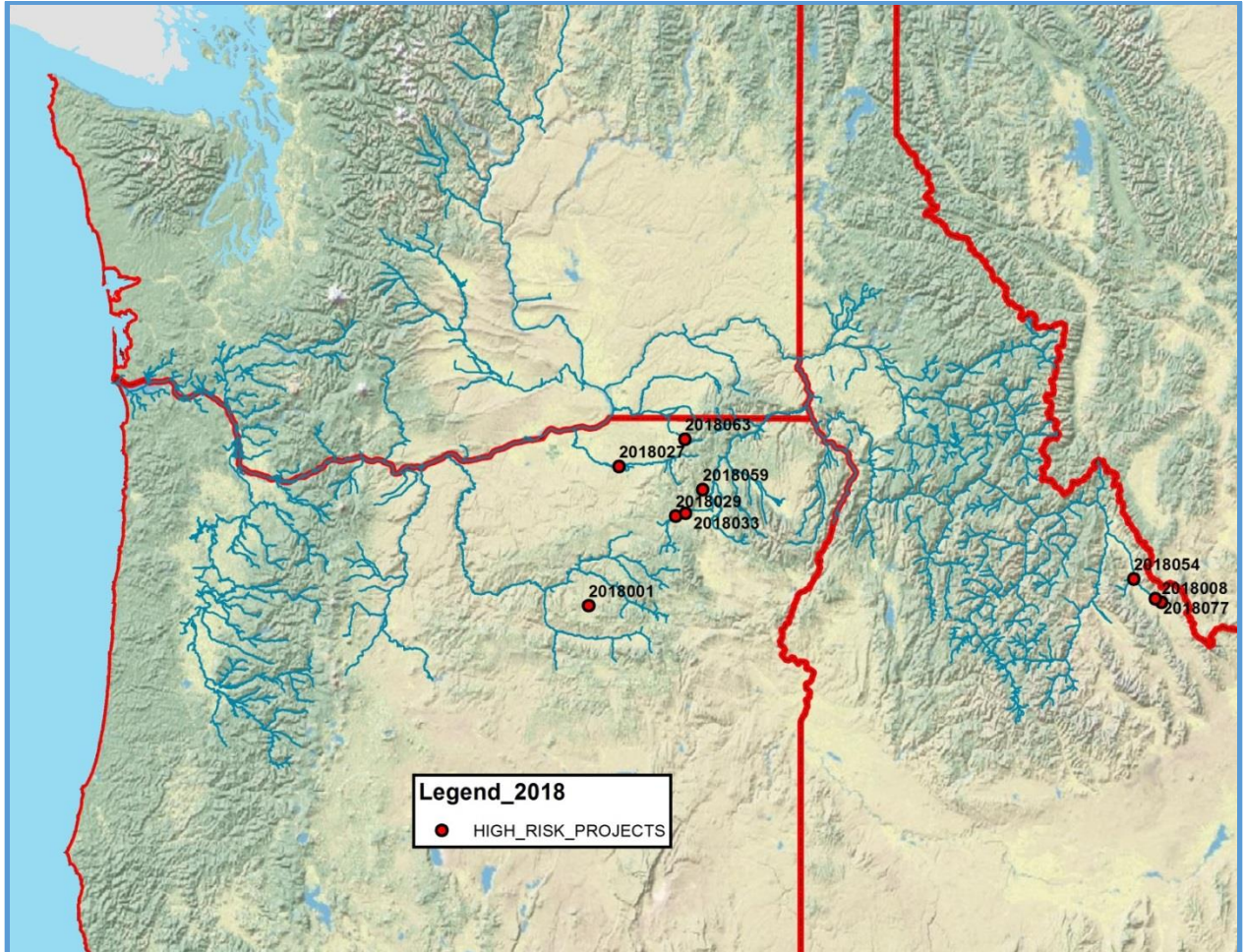
2018013(Dillon Bank Restoration)_3

HIGH RISK PROJECT SHOWCASE:

These projects are the most significant achievements towards salmon restoration in 2018. These are complex projects that require extensive collaboration, funding, design and planning. Locations of this projects are shown in Figure All of these projects were considered high risk and involved both USFWS and NMFS interagency review and final approval. While BPA was the funding entity, the project sponsors were essential in creating and maintaining landowner relationships and negotiations.

HIP3 NO#	SPONSOR	PROJECT	DESCRIPTION
2018001	Warm Springs Tribe	John Day Tributary Passage and Flow - Fox Creek	Continuation since 2017, Channel Reconstruction, channel grading, beaver analog placement, and large woody debris placement
2018008	IDFG	Eighteenmile Creek Restoration Beyeler – Phase 2	PHASE 2: Installation of a channel spanning log-drop, low-elevation weir.
2018027	CTUIR	Umatilla Anadromous Fish	Excavation of a new channel and side channels to move the stream into its historic channel alignment and meanders in Bonifer Reach
2018029	USDA-FS	BirdTrack Springs Fish Habitat Restoration Project	Construction of approximately 2 miles of new channel, including main Grande Ronde River, 85,000 cubic yards of excavation. channel segments and side channels.
2018033	CTUIR	Rock Creek Fish Habitat Enhancement Project Phase III	Final Phase in creation of new meander bends that will increase channel sinuosity, decrease channel slope and assist in floodplain reconnection and the development of more diverse channel structure and hydraulic variability.
2018054	Trout Unlimited	Little Sawmill Creek Restoration Project	New channel construction, channel grading, beaver analog placement, and large woody debris placement
2018059	Union SWCD	Aiwohi Dry Creek Fish Habitat Restoration	Channel Reconstruction, increasing sinosity, increasing pools 300%, increasing lwd from 0 - 500 peices
2018063	CTUIR	South Fork Walla Walla River - Hutchison Project	Construction work will include floodplain, alcove, and side channel excavation; and installation of any LWD structures, habitat boulders, roughened riffles, and fords
2018077	Lemhi Regional Land Trust	Big Springs Restoration Phase II	Lengthened the overall length of Big Springs Creek by about 1,130 (32% increase) feet and the Lemhi River by about 400 feet (14% increase)

FIGURE 5: 2018 HIGH RISK PROJECT LOCATIONS





2018098(Placement of Fish Bypass)_1



2018098(Placement of Fish Bypass)_2

FISH SCREENS

BPA funds two ODFW fish screen programs: one for O&M actions within the Columbia River Basin in Oregon; and another for construction of fish screens within the John Day River Basin. BPA collected PNFs and PCFs with the following number of actions (Table 13) for both ODFW fish screen contracts.

TABLE 13: FISH SCREENS

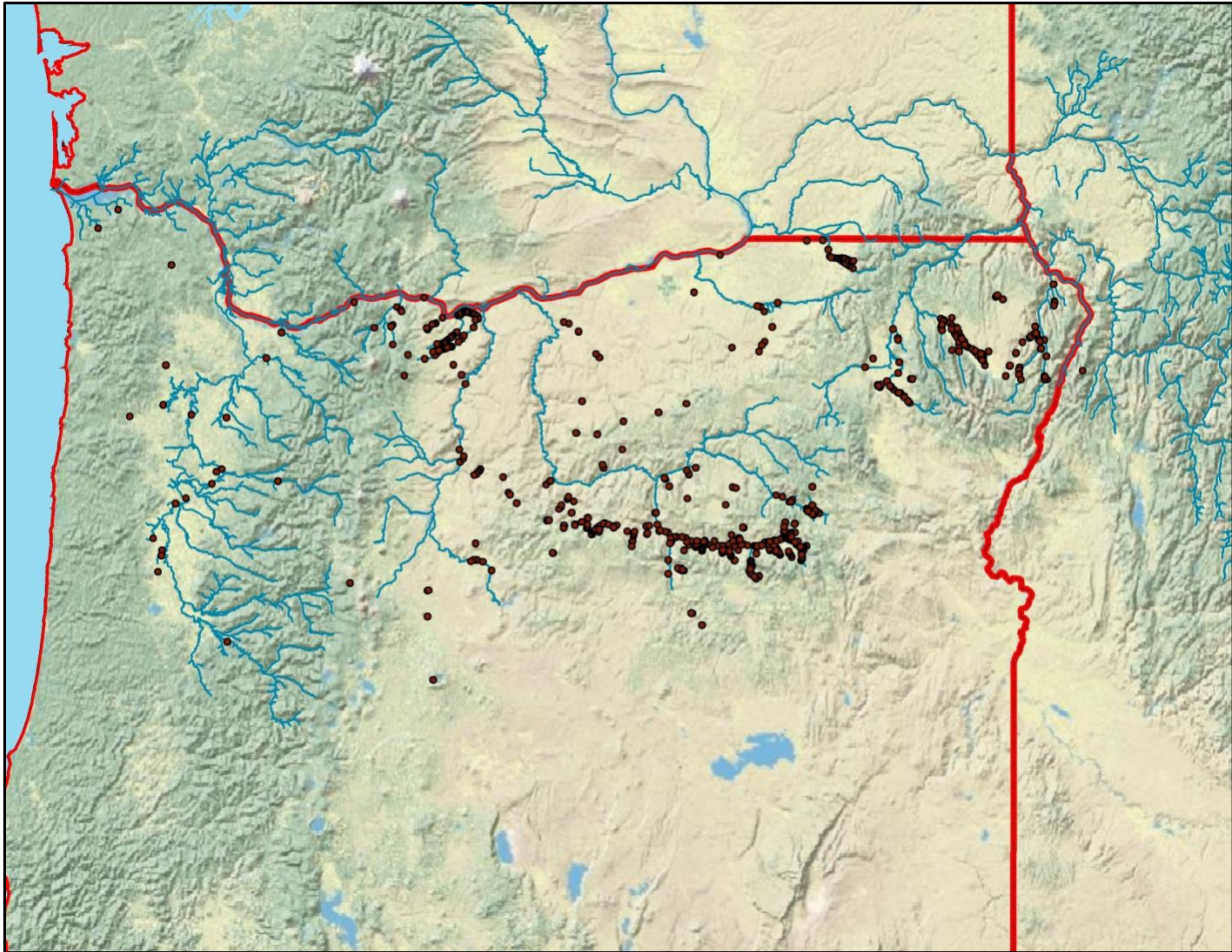
HIP3 NO#	Project Title	No# of Actions
2018045	ODFW Fish Screens - Low Risk Projects I	19
2018099	ODFW Fish Screens - Low Risk Projects II	2
2018105	ODFW Fish Screens Projects O & M	730
2018106	ODFW Fish Screens - Low Risk Projects III	1

2018 was the second full year that the HIPIII was used to cover all actions associated with the ODFW O&M contract. BPA worked closely with ODFW to explore how they track the O&M actions throughout the basin. Initially, it was difficult to project what specific actions were being taken and the potential impacts to listed species as a result; however, BPA established reporting requirements that included a list of typical actions taken, a list of specific action locations (Figure 5 below) where maintenance was anticipated to occur, and a field form for specific actions that caused reportable impacts (turbidity exceedances and take of listed species).



2018096(ODFW)Fish_Screens

FIGURE 5: 2018 HIPIII FISH SCREEN O&M LOCATIONS



The O&M Oregon Fish Screens (HIPIII No# 2018105) project reported 730 action with the locations shown in Figure 5. These actions consisted of minor O&M activities associated with fish screens that occurred year-round across the state of Oregon within the Grande Ronde, Umatilla, John Day, Deschutes, Willamette, and Hood river subbasins. These included activities performed by ODFW screen tenders such as the following: debris and sediment removal, check screen seals, inspect screens for damage, inspect gear boxes and drive lines, inspect solar units, inspect fish bypass, inspect fishways, and other O&M actions. These activities were easily isolated from the water with no impacts to the stream.



2018091(Beaver Creek)Deflector_Jam



2018091(Beaver Creek)



2018091(Beaver Creek)Wood_Crib



2018101(WDFW Flow Connection)Levee Removal