HABITAT IMPROVEMENT PROGRAM HIPIII

2019 ANNUAL MONITORING REPORT

Bonneville
POWER ADMINISTRATION

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2019071 (Govt Island) Levee Removal

SUMMARY

This is the sixth and final annual monitoring report required under the Habitat Improvement Program III Biological Opinions (HIPIII) (NMFS No# 2013/9724, USFWS 01E0FWOO-2013-F-0199). This report summarizes activities completed in calendar year 2019 and summarizes 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 and a small increase of herbicide acreage, 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 HIP Review Process. After nearly 5 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 HIP 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.

HIPIII PROJECTS AUTHORIZED

During 2019, the HIPIII BOs authorized 96 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 typically consisting of multiple work elements and a project consisting of multiple contracts over time.

For the sake of the HIP, projects are mainly reported on the contract level, occasional multiple contracts may be lumped together if they share the same sponsor & location. Figures 1&2 are overlain with USFWS field office and NMFS branch jurisdictions. A majority were low risk (64), 26 were medium risk, and 6 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), and if high risk, Interagency review by the Services Habitat Biologists.

2019053 (White Creek) Channel Reconstruction

TABLE 1: HIPIII PROJECT AUTHORIZATIONS (64 LOW RISK) 2019

HIP3 NO#	Project Title	Habitat Branch	Field Office
2019001	Gail Achterman Phase I	Willamette	Portland
2019002	WA Estuary MOA - Chinook Habitat Conditions Management	WA/LCR	Lacey
2019003	Willamette Mission Restoration Phase 5	Willamette	NA
2019004	Tucannon River Programmatic Habitat Update	N Snake	Spokane

HIP3 NO#	Project Title	Habitat Branch	Field Office
2019005	ODFW Operations and Maintenance	Willamette	Portland
2019006	Protect Shillapoo Wildlife Area	WA/LCR	NA
2019013	Caribou Creek - Cortese/Soreson	CRB	Wenatchee
2019014	Kerry Island Restoration - Follow-up Weed Treatment and Planting	WA/LCR	Portland
2019015	Wallacut River Confluence Restoration	WA/LCR	Lacey
2019016	Install Well - Spring Creek Papineau Well	CRB	Wenatchee
2019017	Yakima River - Bristol Flats Pump Screen	CRB	Wenatchee
2019018	Tucannon PA 26 Maintenance	N Snake	Spokane
2019021	Tucannon PA 32	N Snake	Spokane
2019022	Grande Ronde Subbasin Restoration Weed Treatments - 19	CRB	La Grande
2019024	Umatilla Fish Passage O & M	CRB	La Grande
2019026	Rainwater Wildlife Area	CRB	Spokane
2019027	Lyle Falls Fishway Vegetation Planting and Herbicide Use	CRB	Wenatchee
2019029	Asotin Creek Wildlife Mitigation O & M 2019	N Snake	Spokane
2019031	Fox Creek Mid Reach	CRB	NA
2019032	Asotin County Watershed Habitat Enhancement and Restoration	S Snake	Spokane
2019034	Grand Ronde Supplmentation M&E 2019	CRB	La Grande
2019037	Evans Creek Culvert Replacement Project	WC & LCR	Portland
2019039	Pratt Creek Fish Screen Project	S Snake	Chubbock
2019040	Elochoman 2 Restoration - Weed Treatment Planting Earthwork	WA/LCR	Portland
2019041	Elochoman 3 Restoration - Weed Treatment and Building Demolition	WA/LCR	Portland
2019042	Klickitat Watershed Enhancement - 2019 Vegetation Planting and MGMT	CRB	Wenatchee
2019043	Columbia Stock Ranch - Weed Treatment and Fence	WA/LCR	Portland
2019044	ODFW Fish Screens - Low Risk Projects	CRB	La Grande
2019045	Upper Salmon Fish Screen Operation and Maintenance	S Snake	Chubbock
2019048	Pahsimeroi River Habitat Project Site Weed Treatments	S Snake	Chubbock
2019049	Lemhi River Restoration Project Site Weed Treatment and Hydroseeding	S Snake	Chubbock
2019054	Green Island Vegetation Management	Willamette	Portland
2019028	Isquulktpe Watershed Project	CRB	NA
2019060	Sulpher Creek Beaver Dam Analog Project	S Snake	Chubbock
2019038	Sunnyside Wildlife Mitigation	CRB	Wenatchee
2019062	Minam PIT Array Installation	S Snake	La Grande
2019063	Hungry Horse Mitigation Habitat Restoration and RM&E	NA	Helena
2019065	NE Oregon Precious Lands Wildlife Area	S Snake	La Grande
2019066	Pine Creek Conservation Area	CRB	Bend
2019067	Nora Creek - Vegetation Planting and BDA Installation	N Snake	NA
2019047	Sagebrush Flat Wildlife Mitigation	NA	Wenatchee
2019061	Fifteenmile Creek Habitat Improvement - Taylorville	CRB	Portland
2019073	North Fork Habitat Improvement Hutton Murphy Repair	N Snake	Boise
2019074	Wenas Wildlife Area	CRB	Wenatchee
2019070	Fifteenmile Creek Habitat Improvement	CRB	NA
2019079	Hungry Horse Mitigation/Flathead Lake Restoration & RME	NA	Helena
2019081	ODFW Fish Screens - Low Risk Projects	CRB	La Grande

HIP3 NO#	Project Title	Habitat Branch	Field Office
2019082	Yakima Phase II Fish Screens O&M	CRB	Wenatchee
2019083	Whiskey Creek Stream and Floodplain Restoration	S Snake	NA
2019084	Enhance Habitat North Fork John Day River: Herbicides	CRB	La Grande
2019087	Marsh Creek Pit Tag Array	S Snake	Boise
2019089	Libby Reservour Mitigation Restoration and RM&E	NA	Montana
2019090	Bear Creek Juniper Treatment	CRB	La Grande
2019091	Yakima Basin Side Channels - Veg Planting and Wood Placement	CRB	Wenatchee
2019093	Yakima Basin Side Channels - North Fork Teanaway	CRB	Wenatchee
2019094	Yakima Basin Side Channels - North Fork Manastach Phase II	CRB	Wenatchee
2019080	East Fork South Fork Salmon River Restoration	N Snake	Boise
2019097	Carlson Creek Wood Replenishment TCF Phase 3	CRB	Wenatchee
2019099	Lapwai Creek Watershed Restoration	N Snake	NA
2019100	John Day Fish Habitat Enhancement Program	CRB	La Grande
2019102	West Sand Island Habitat Restoration - Phase 1	WA/LCR	Portland
2019106	John Day Fish Habitat Enhancement Program: Hay Creek BDAs	CRB	La Grande
2019110	Hellsgate Big Game Winter Range	CRB	Wenatchee
2019111	Trout Creek Watershed Restoration	CRB	Bend

2019033 Little Wind Phase IV Helicopter Placement

TABLE 2: HIPIII PROJECT AUTHORIZATIONS (26 MEDIUM RISK) 2019

HIP3 NO#	Project Title	Habitat Branch	Field Office
2019007	East Fork Hood River - Mills LWD Placement	CRB	Portland
2019010	North Fork Touchet Wolf Fork	CRB	Spokane

HIP3 NO#	Project Title	Habitat Branch	Field Office
2019011	Barkley Irrigation Company MVID	CRB	Wenatchee
2019019	Garden Creek Bridges	S Snake	Chubbock
2019096	Rock Creek Hewes Diversion Removal and Habitat Enhancement	CRB	NA
2019033	Little Wind Phase IV	WC & LCR	Lacey
2019036	Couse Creek Confluence Fish Passage Project	CRB	La Grande
2019105	Yakima River Mile 89.5 Floodplain Restoration	CRB	Wenatchee
2019046	Upper Fox Creek Reach 18 Crissman	CRB	NA
2019108	Pharr Road Side Channel Enhancement	CRB	Wenatchee
2019050	Lemhi River Restoration	S Snake	Chubbock
2019052	Dammerman Meadow Restoration	N Snake	NA
2019053	White Creek Meadow Enhancement Project	CRB	NA
2019055	North Scappoose Creek Stream Restoration	Willamette	Portland
2019064	Vincent to Caribou PHASE II	CRB	La Grande
2019069	WFI Adaptive Management	CRB	Wenatchee
2019072	Lapwai Creek Watershed Restoration	N Snake	NA
2019071	Government Island Restoration Project	UWR	Portland
2019077	Upper Tee Meadow Restoration Project	N Snake	NA
2019078	Middle Eighteenmile Creek Habitat Improvement - Breshars	S Snake	Chubbock
2019075	McCarthy Creek Phase 2 Restoration Project	UWR	Portland
2019086	Upper Toppenish Wood Replenishment Project	CRB	Wenatchee
2019098	Beaver Creek Reach 5	CRB	Wenatchee
2019103	Cooke Creek Fish Screening & Passage Project	CRB	Wenatchee
2019107	Upper Beaver Creek Repair Project	CRB	Wenatchee

2019076 (L-61) Cofferdam Installation

2019050 (Lehmi River Restoration) Cofferdam and large wood placement

2019052 (Dammerman)LW Placement

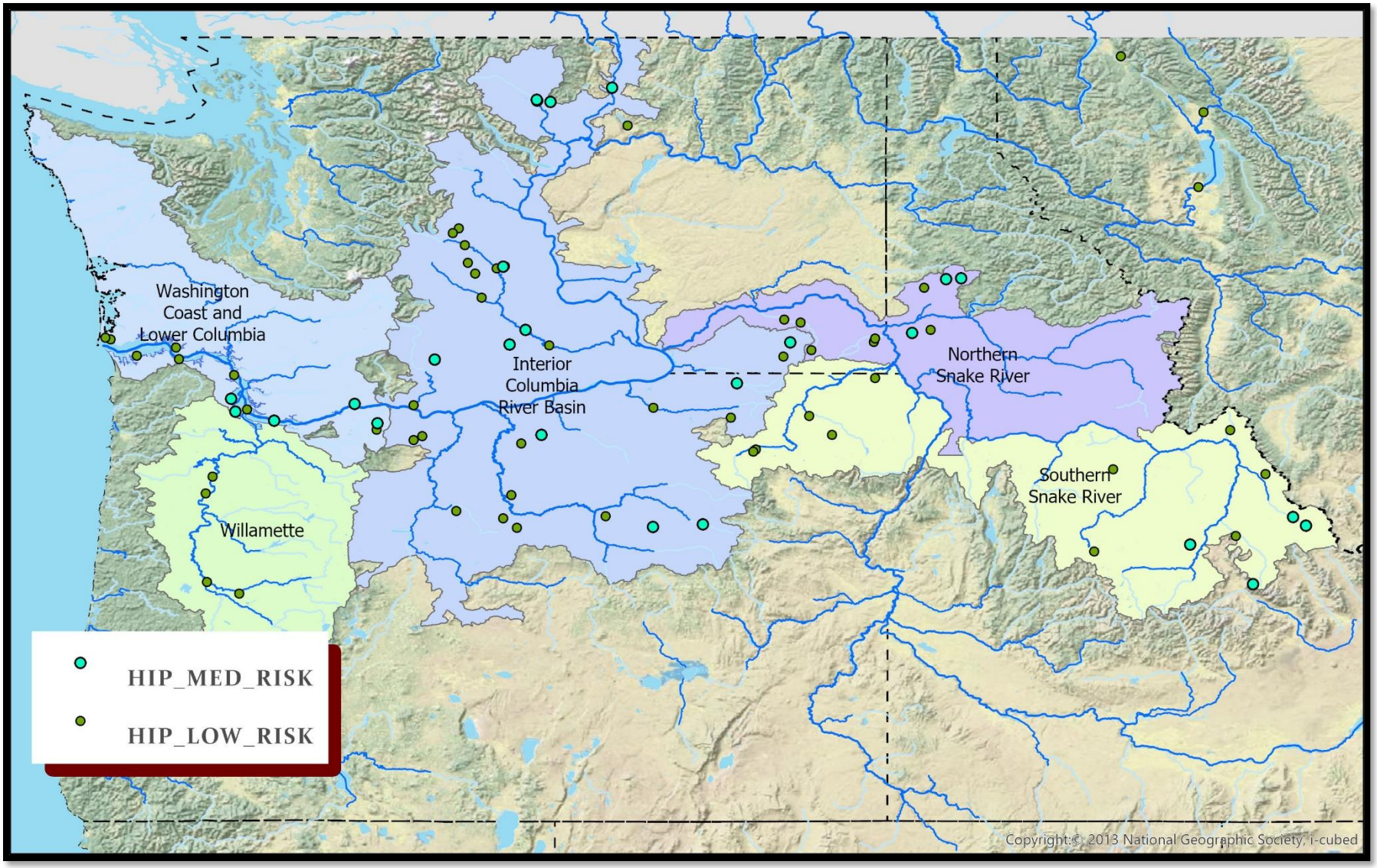


FIGURE 1: 2019 Med-Low Risk HIPIII PROJECT LOCATIONS (NMFS)

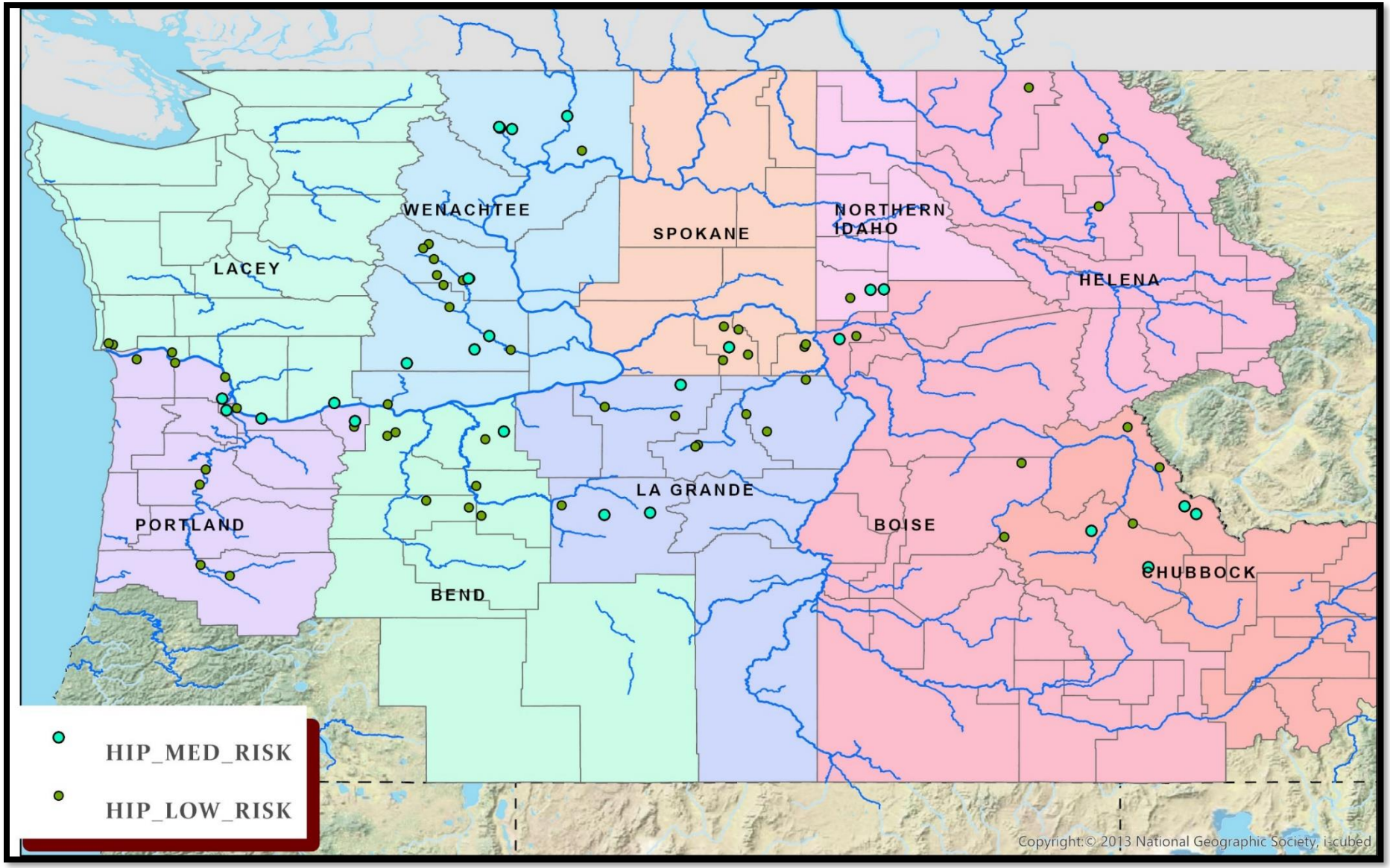


FIGURE 2: 2019 Med-Low HIPIII PROJECT LOCATIONS (USFWS)

2019019 BirdTrack Springs Channel Reconstruction

HIGH RISK PROJECT SHOWCASE:

These projects are BPA's most significant achievements towards salmon restoration in 2019 (Table 3). Most of them are a continuation of previous years contracts that were designed and approved in previous years. These are complex projects that require extensive collaboration, funding, design and planning. Locations of this projects are shown in Figure (3 & 4). 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 and provided extensive technical assistance, the project sponsors were essential in creating and maintaining landowner relationships and negotiations.

TABLE 3: HIGH RISK PROJECTS

HIP3 NO#	SPONSOR	PROJECT	DESCRIPTION
2019008	BPA. BOR, USFWS	Stiegerwald Floodplain Restoration Project	Largest project attempted on LCR, more than $25 million. 7 year preparation. Removing 2.25 miles of levee, floodplain reconnection, herbicides.
2019012	Trout Unlimited	Yankee Fork Bonanza Floodplain Reconnection Project	Continuation of removal of dredge tailings, construction of new channel, additions of floodplain wood and follow up vegetation plantings.
2019023	BPA, BOR, USFS	Bird Track Springs Fish Habitat Restoration Project	Continuation of previous years, levee removal, channel creation, 200 wood structures and bank treatments.
2019051	CTUIR	Umatilla Anadromous Fish – Bonifer Floodplain Restoration	Phase III, Continuation from 2017, channel reconstruction, BDAs and floodplain reshaping.
2019056	Methow Salmon Recovery Foundation	Twisp River Floodplain	Phase II to include 5 engineered logjams on the Twisp River mainstem, and 18 engineered logjams and 37 rootwad placements in Twisp River side channels and floodplains, and two alcoves.
2019058	Lemhi Regional Land Trust	Big Springs/Lemhi Confluence	Phase II Construction on Phase II includes 0.54 miles of the Lemhi River and 1.27 miles of Big Springs. Creation of side channels, islands, and inset floodplain areas to increase margin habitat and riparian areas.

Check out Stiegerwald, possibly the biggest Restoration Project in the United States:

https://www.columbian.com/news/2020/may/30/habitat-restoration-project-set-at-steigerwald-lake-national-wildlife-refuge/

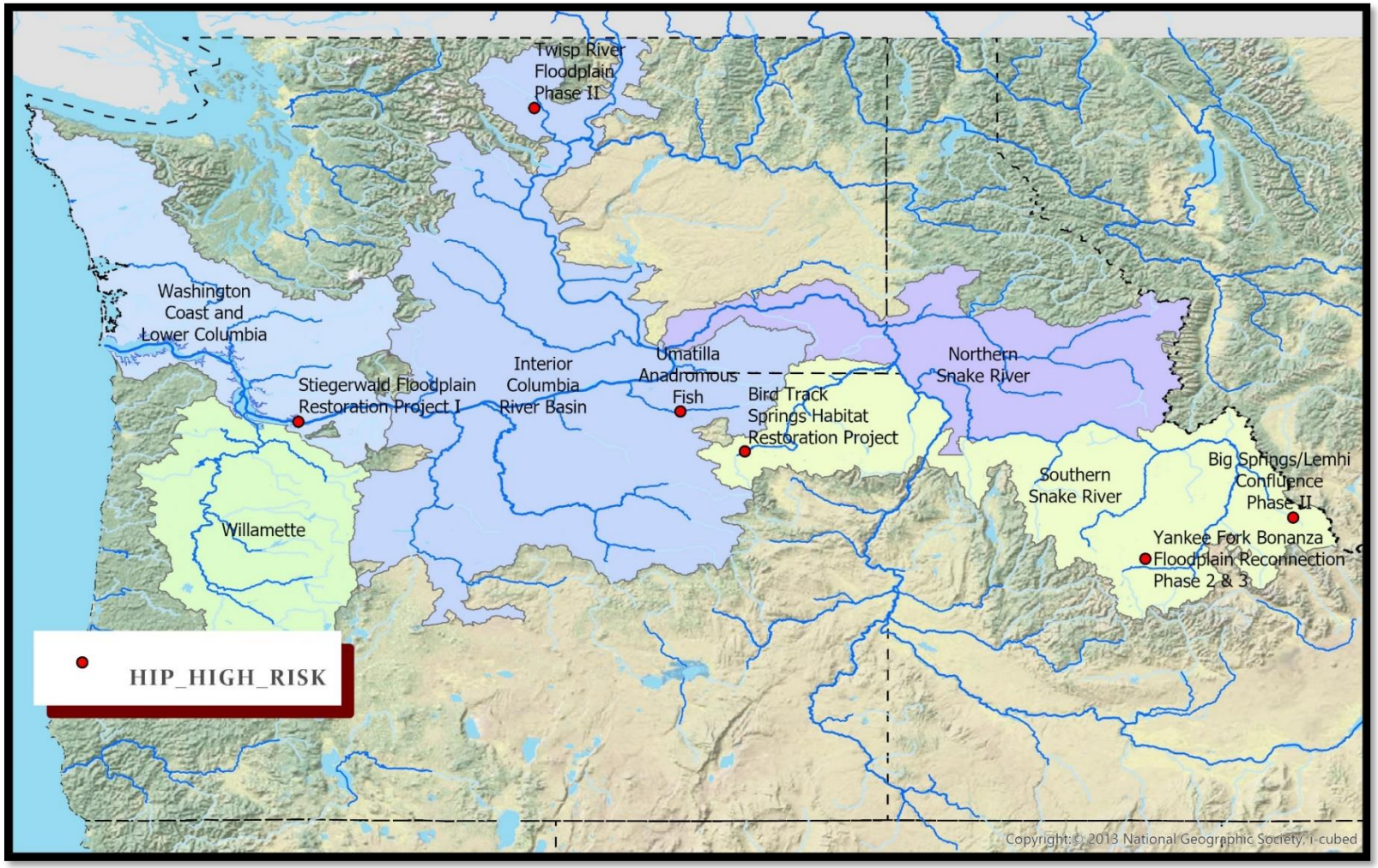


FIGURE 3: 2019 HIGH RISK PROJECT LOCATIONS

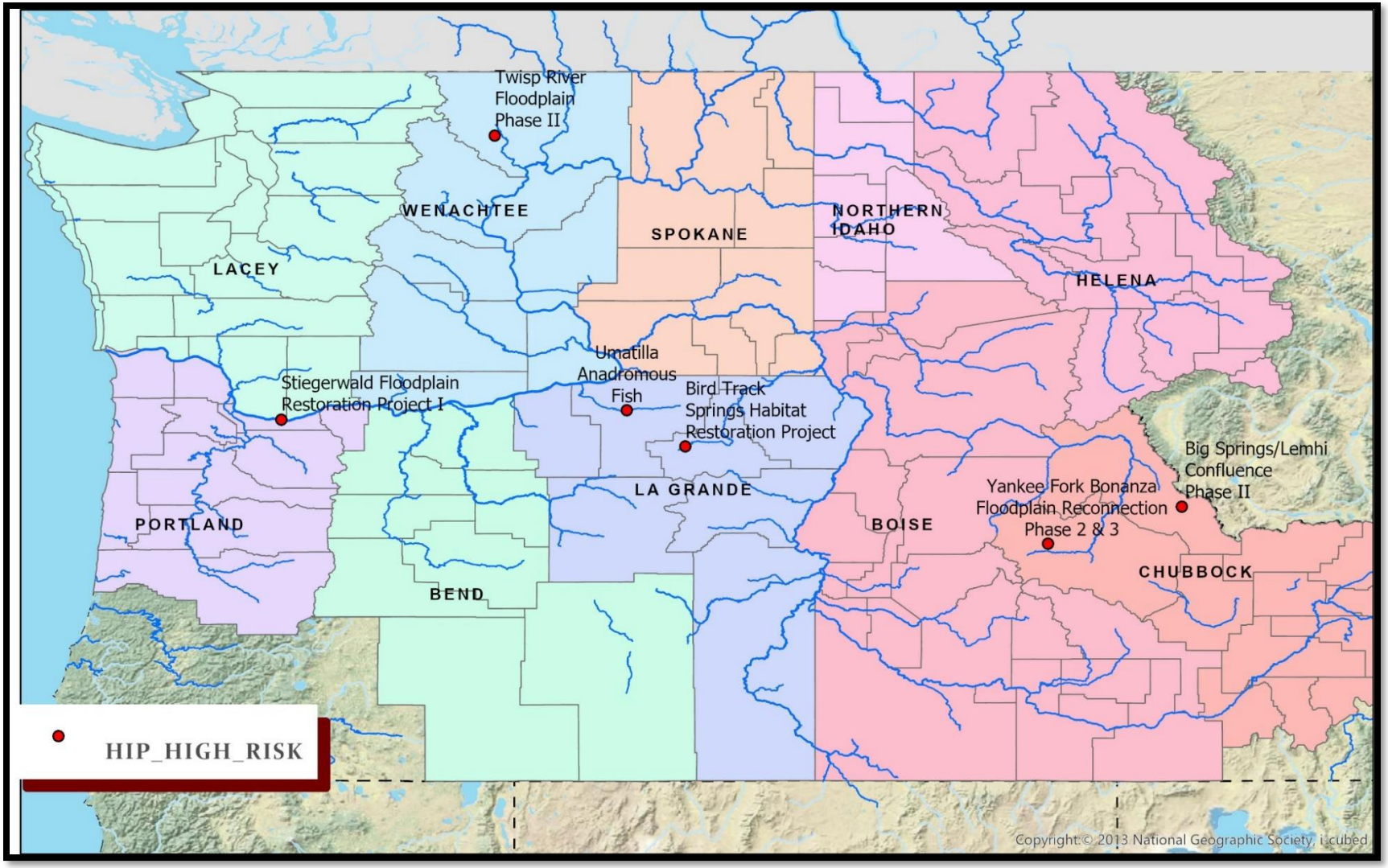


FIGURE 4: 2019 HIGH RISK PROJECT LOCATIONS

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.

TABLE 4: PROJECT ACTIVITIES

Categoy	Subcategory	13	14	15	16	17	18	19
1. Fish Passage Restoration								
	a. Dams, Water Control or Legacy Structure Removal.	1	2	3	2	5	3	8
	b. Consolidate, or Replace Existing Irrigation Diversions.	3	3	1	0	5	4	6
	c. Headcut and Grade Stabilization.	3	6	9	9	9	4	4
	d. Low Flow Consolidation.	0	0	0	0	0	1	0
	e. Providing Fish Passage at an Existing Facility.	2	6	4	2	4	5	2
	f. Bridge and Culvert Removal or Replacement.	8	11	9	11	6	4	8
	g. Bridge and Culvert Maintenance.	0	0	1	0	1	0	1
	h. Installation of Fords.	2	0	2	0	1	2	0
2. River, Stream, Floodplain, and Wetland Restoration.								
	a. Improve Secondary Channel and Wetland Habitats.	6	11	8	12	17	19	20
	b. Set-back or Removal of Existing, Berms, Dikes, and Levees.	2	7	10	5	7	8	12
	c. Protect Streambanks Using Bioengineering Methods.	4	8	10	7	7	11	13
	d. Install Habitat-Forming Natural Material Instream Structures	11	20	15	20	25	29	35
	e. Riparian Vegetation Planting.	19	30	32	33	38	42	46
	f. Channel Reconstruction.	2	4	3	4	6	9	12
3. Invasive and Non-Native Plant Control.								
	a. Manage Vegetation using Physical Controls.	18	32	26	25	27	35	38
	b. Manage Vegetation using Herbicides.	39	45	39	28	29	37	39
4. Piling Removal.								
	Pile Removal	0	0	0	1	0	2	1
5. Road and Trail Erosion Control, Maintenance, and Decommissioning.								
	a. Maintain Roads.	2	4	3	2	2	4	8
	b. Decommission Roads.	0	3	0	0	2	2	2
6. In-channel Nutrient Enhancement.								
	Nutrient Enhancement.	0	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	0
	b. Convert Water Conveyance from Open Ditch to Pipeline or Line	1	5	1	1	3	3	1
	c. Convert from Instream Diversions to Groundwater Wells for	0	0	0	0	0	1	0
	d. Install or Replace Return Flow Cooling Systems.	1	0	0	1	0	0	0
	e. Install Irrigation Water Siphon Beneath Waterway.	2	0	0	2	1	0	0
	f. Livestock Watering Facilities.	4	8	5	1	4	4	4
	g. Install New or Upgrade/Maintain Existing Fish Screens.	3	4	5	23	737	775	747

8. Fisheries, Hydrologic, and Geomorphologic Surveys.								
	Surveys	18	25	24	23	16	23	11
9. Special Actions (for Terrestrial Species).								
	a. Install/develop Wildlife Structures.	0	0	0	1	1	1	4
	b. Fencing construction for Livestock Control	1	5	7	7	14	13	13
	c. Implement Erosion Control Practices.	0	3	2	0	6	6	6
	d. Plant Vegetation.	2	6	7	6	14	18	20
	e. Tree Removal for LW Projects.	0	3	1	3	3	6	5

2019039 (Pratt Creek) Fish Screen

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 2019 there were **3 reported instances** where turbidity was elevated above background for two or more monitoring intervals. Each instance involved water coming into contact with newly exposed earth during low flow events.

TABLE 5a:Turbidity Exceedence (2019012)

HIPIII NO#	PROJECT
2019012	Yankee Fork Bonanza Floodplain Reconnection
EXPLANATION	Prior to the in water work window in 2019, off channel construction operations were proceeding as scheduled and in the dry. As the off channel areas were excavated, groundwater flow path was encountered. This groundwater flowed fast enough to carry silts and fines through the mine tailings and emerge in the Yankee Fork 850 feet away from the construction site. The resulting turbidity was reported to every state and federal regulatory agencies as well as the local newspaper. The project was delayed while the sponsor reported and conferred with agencies and took steps to manage groundwater so that turbid groundwater would not enter the Yankee Fork. Through the remainder of the summer, no more turbidity events exceeded either DEQ or HIP III criteria

2019012 (Yankee Fork) pumps used to lower groundwater table to prevent turbid water from percoloating through the mine tailings to Yankee Fork.

2019012 (Yankee Fork) Turbidity Plume from groundwater.

TABLE 5b:Turbidity Exceedence (2019013)

HIPIII NO#	PROJECT
2019013	Caribou Creek – Cortese/Sorenson RM 1.17
EXPLANATION	The Yakima Tributary Access & Habitat Program (YTAHP) removed an inactive unscreened gravity irrigation diversion on Caribou Creek to fully restore fish passage at stream mile 1.17. Before construction began the project work area was isolated from Caribou Creek, which was diverted around the site through a lined gravity-fed bypass channel. Turbidity monitoring took place during installation of the upstream coffer dam, which diverted flow into the bypass channel. Turbidity was related to placement of the ecology blocks and plastic sheeting to create the coffer dams. After dewatering, all work was completed in the dewatered isolated channel. The existing concrete irrigation dam was removed and disposed of. Upon rewatering, there was a short term pulse pf turbidity that persisted for 2 monitoring intervals, after which returned to background levels. The stream then was allowed to naturally recover and reshape the streambed post-diversion removal; natural stream flows will redistribute upstream sediment deposits to downstream scour locations.

2019013(Caribou Creek) Structures before removal

2019013(Caribou Creek) After removal, note bare earth

TABLE 5c:Turbidity Exceedence (2019046)

HIPIII NO#	PROJECT
2019046	Upper Fox Creek Reach Crissman
EXPLANATION	The main elements of the 2019 instream restoration project at Upper Fox included the replacement of two culverts with a bridge, large wood installation, construction/reactivation of two side channels, addition of alcoves and reconnection of the Murphy Creek tributary. Optical high turbidity levels within the instream work window were reported for more than 4 monitoring intervals when wood was placed or the culverts were removed. Continuously high turbidity was not observed between monitoring time periods. The area is comprised of heavily grazed areas devoid of riparian vegetation. High sediment loads and undercut banks are observed throughout the area in the John Day Basin.

2019046 (Fox Creek Crissman_Before)

2019046 (Fox Creek Crissman_After)

2019046 (Fox Creek Crissman_Before)

2019046 (Fox Creek Crissman_After)

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 52 projects that required near or in-water construction in 2015.

	2013	2014	2015	2016	2017	2018	2019
IWW	35	45	41	40	43	43	52
Total	86	96	86	95	92	113	99

2019013 (Caribou Creek) Work Area Isolation

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 any other year during work area isolation activities, despite the number of complex projects increasing. At this point, there appears to be no apparent relationship between number of projects happening on the ground, complexity and techniques. The number of fish taken appears to be an entirely random event and has near nothing to do with number of projects happening on the ground, complexity and techniques.

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	LIMITS	2013 TAKE	2014 TAKE	2015 TAKE	2016 TAKE	2017 TAKE	2018 TAKE	2019 TAKE
Interior Columbia	Capture	5925	841	3593	3541	2435	2446	3282	1174
	Mortality	296	12	8	59	130	78	189	33
Willamette	Capture	1200	0	0	0	0	0	26	0
	Mortality	60	0	0	0	0	0	0	0
Bull Trout	Capture	250	0	14	29	5	0	4	0
	Mortality	13	0	0	0	0	0	0	0

2019108(Pharr Road)Large Wood Placement

APPROVED VARIANCES

In 2019, BPA requested 23 variances with the most common being inwater work window extensions (Table 7 & 8). Most of the variances types are consistent with the variances requested for previous years with the exception of application of herbicides in the estuary and use of helicopter during Norther Spotted Owl (NSO) nesting windows.

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, staging area locations, and work area isolation techniques. Further, BPA ETS reviewed all previous variances to ensure that situations may not arise that would require a variance and not be able to get one, thus stopping the project.

Upon finalization of the HIP4 in March of 2020 variances have been discontinued.

TABLE 7: NUMBER OF VARIANCES

	2014	2015	2016	2017	2018	2019
Variances	19	20	18	16	17	23

2019091(YKFP) Large Wood Placement

TABLE 8: VARIANCE RATIONALE

HIPIII NO#	PROJECT	RATIONALE
2019006	Protect Shillapoo Wildlife Area	Broadcast spray of Triclopyr in upland
2019008	Stiegerwald Floodplain Restoration Project I	Use of herbicides in estuary
2019012	Yankee Fork Bonanza Floodplain Reconnection Phase 2 & 3	Change in work area isolation techniques
2019014	Kerry Island Restoration - Follow-up Weed Treatment and Planting	Use of herbicides in estuary
2019016	Install Well - Spring Creek Papineau Well	New wells will be located less than ¼ mile from the stream

2019019	Garden Creek Bridges	IWWW extension
2019024	Umatilla Fish Passage O & M	IWW occurring 1 – 3 times year
2019038	Sunnyside Wildlife Mitigation	Use of adjuvant not on list in upland areas
2019039	Pratt Creek Fish Screen Project	IWWW extension
2019050	Lemhi River Restoration	IWWW extension
2019052	Dammerman Meadow Restoration	IWWW extension
2019064	Vincent to Caribou PHASE II	Work Area isolation techniques
2019072	Lapwai Creek Watershed Restoration	IWWW extension
2019074	Wenas Wildlife Area	Herbicide in upland area not on list
2019078	Middle Eighteenmile Creek Habitat Improvement - Breshars	Change in work area isolation techniques
2019087	Marsh Creek Pit Tag Array	IWWW extension
2019093	Yakima Basin Side Channels - North Fork Teanaway	Helicopter outside of NSO window
2019094	Yakima Basin Side Channels - North Fork Manastach Phase II	Helicopter outside of NSO window
2019102	West Sand Island Habitat Restoration - Phase 1	Use of herbicides in estuary
2019105	Yakima River Mile 89.5 Floodplain Restoration	IWWW extension
2019106	John Day Fish Habitat Enhancement Program: Hay Creek BDAs	IWWW extension

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 HIPIII Handbook and aided by the in-depth technical reviews provided by BPA Engineering Technical Services.

TABLE 9: REPORTED NONCOMPLIANCE EVENTS

2013	2014	2015	2016	2017	2018	2019
NA	6	2	1	0	0	0

HERBICIDE USE

Herbicide use continues to be the most widely used project activity category under the HIPIII. 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 HIPIII due to herbicide resistant weeds (upland use of Vista) and expanded applications within the estuary.

2019008 (Stiegerwald) Spot Treatment of Reed Canary Grass

2019071 (Lapwai Creek) Blackberry infestation

FIGURE 5: HERBICIDE APPLICATION (NMFS)

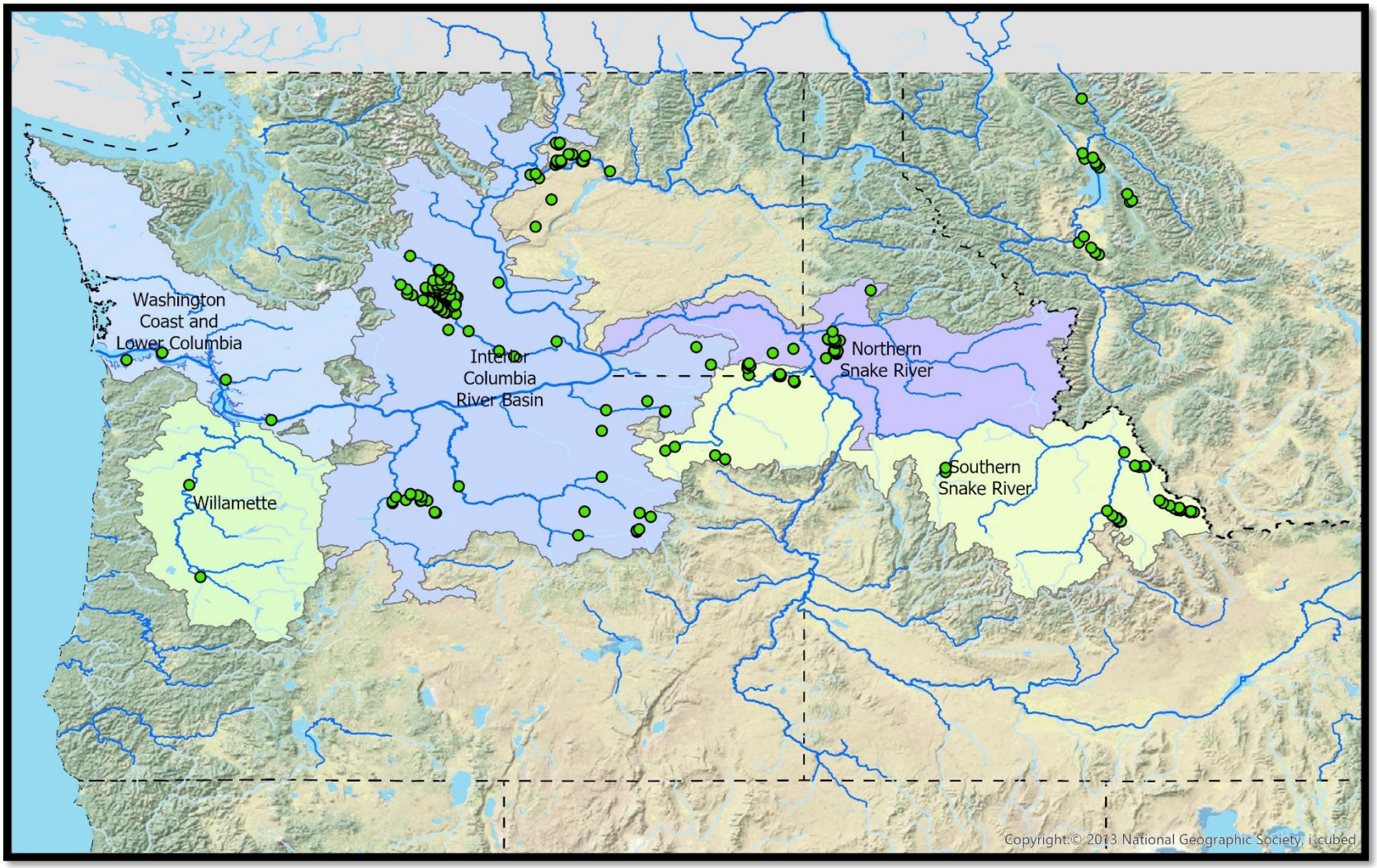
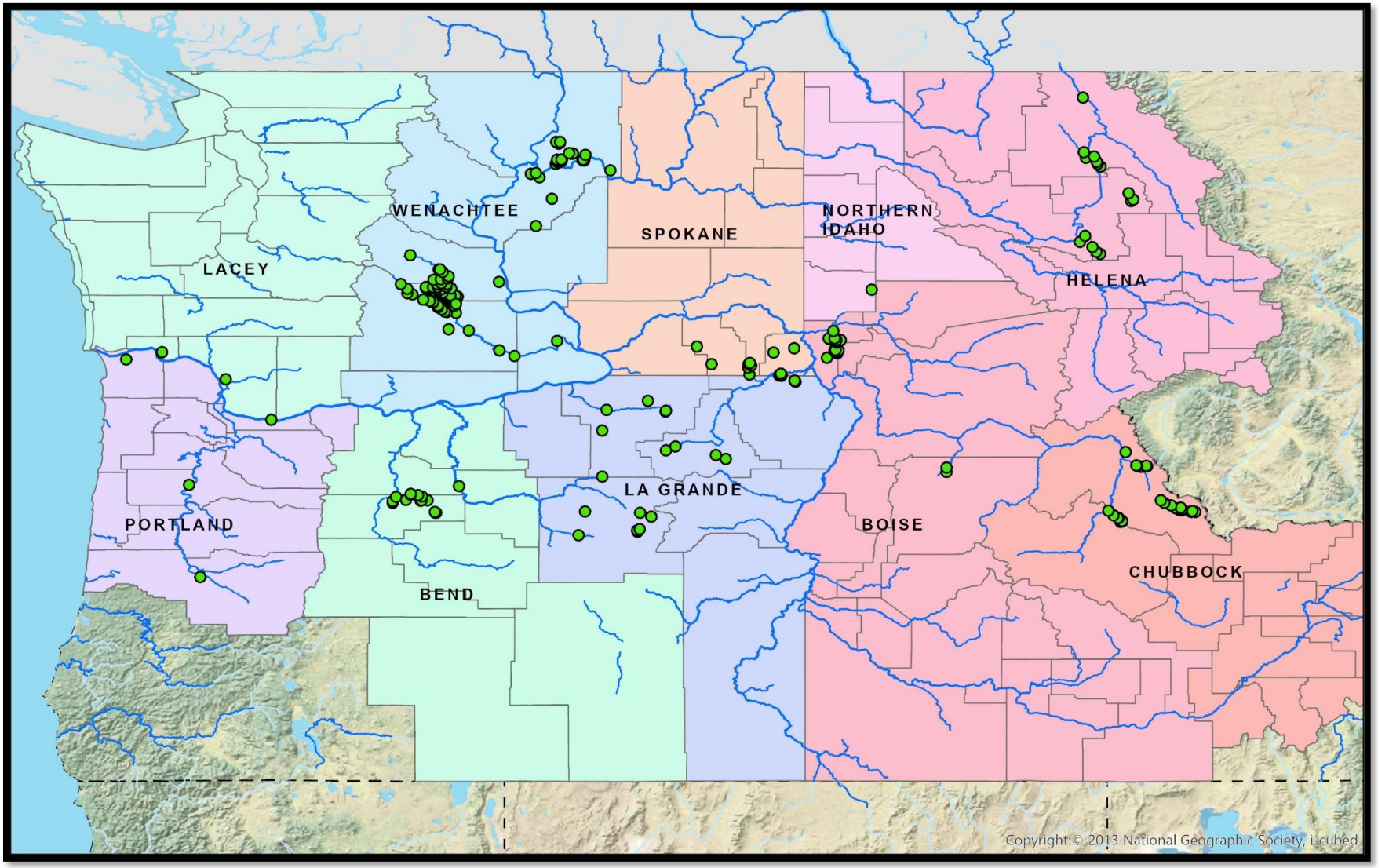


FIGURE 6: HERBICIDE APPLICATION (USFWS)



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 2019, the amount of riparian acres treated has increased and exceeded the limit by 20 acres. This is due to the 2nd phase of Gail Achterman Wildlife Area (GAWA) a public natural area owned by the Oregon Department of Wildlife and hydrologically connected to the mainstem Willamette River in Polk County.

The addition of herbicide treatment in the Estuary and the Willamette is expected to increase the amounts of annual herbicide applied dramatically. However, the HIP4 now has an allowance of 1500 acres of treated area.

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
2019	1020	2976

TABLE 11: PROJECTS WITH HERBICIDE USAGE

HIPIII NO#	PROJECT	RIPARIAN	UPLAND
2019001	Gail Achterman Phase II	288.25	0
2019003	Willamette Mission Restoration Phase 5	75.8	28
2019006	Protect Shillapoo Wildlife Area	0	455.7
2019008	Stiegerwald Floodplain Restoration Project I	156	0
2019022	Grande Ronde Subbasin Restoration Weed Treatments - 19	67.72	73.9
2019024	Umatilla Fish Passage O & M	5	5
2019026	Rainwater Wildlife Area	16	154
2019028	Isquulktpe Watershed Project	0.4	18.183
2019029	Asotin Creek Wildlife Mitigation O & M 2019	0	207
2019038	Sunnyside Wildlife Mitigation	0	38
2019040	Elochoman 2 Restoration - Weed Treatment Planting Earthwork	37	20

2019041	Elochoman 3 Restoration - Weed Treatment and Building Demolition	0	0.5
2019042	Klickitat Watershed Enhancement - 2019 Vegetation Planting and MGMT	0	0
2019046	Upper Fox Creek Reach 18 Crissman	0	12.5
2019047	Sagebrush Flat Wildlife Mitigation	0	116
2019048	Pahsimeroi River Habitat Project Site Weed Treatments	0.153	3
2019049	Lemhi River Restoration Project Site Weed Treatment and Hydroseeding	0.0638	7.963
2019051	Umatilla Anadromous Fish	11.8	28.43
2019052	Dammerman Meadow Restoration	0.2	0
2019054	Green Island Vegetation Management	30	0
2019058	Big Springs/Lemhi Confluence Phase II	0	0
2019063	Hungry Horse Mitigation Habitat Restoration and RM&E	2.1	12.52
2019064	Vincent to Caribou PHASE II	3.34	34.26
2019065	NE Oregon Precious Lands Wildlife Area	85	437
2019066	Pine Creek Conservation Area	0	195.5
2019070	Fifteenmile Creek Habitat Improvement	164.84	36.7
2019074	Wenas Wildlife Area	5.4	476.29
2019079	Hungry Horse Mitigation/Flathead Lake Restoration & RME	13.5	224.5
2019080	East Fork South Fork Salmon River Restoration	15.11	40.3
2019091	Yakima Basin Side Channels - Veg Planting and Wood Placement	5	205
2019099	Lapwai Creek Watershed Restoration	1	42
2019100	John Day Fish Habitat Enhancement Program	30	20
2019102	West Sand Island Habitat Restoration - Phase 1	3.2	0
2019110	Hellsgate Big Game Winter Range	0.25	0.31
2019111	Trout Creek Watershed Restoration	2.75	459.25

2019099 (Lapwai Creek invasives)

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 with the assistance of Dr Scott Hecht (NMFS LCR Branch Chief) 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.

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 HIPIII 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 2021 and beyond.

TABLE 12: HIP REVIEW WORKLOAD

	FY13	FY14	FY15	FY16	FY17	FY18	FY19
Medium Risk	4	14	24	24	23	37	26
High Risk	2	6	2	3	5	14	6

The previous year (2018) had a marginal increase in proposed projects and 2019 reverted to the mean. This slug of projects may have had to do with funding expiration associated with Accord funding, which is set to expire this year in 2019. BPA has not made a decision to extend the Accords as of yet.

2019052(Dammerman) Large Wood Placement

Coho Reported in Northern WA

Work isolation was required for some project components explained below. Brian Fisher of the Methow Salmon Recovery Foundation reported 10 coho salmon captured. The project area is in Okanagan County, Twisp River, tributary to the Methow River. As coho are predominantly in coastal streams and LCR this appears extraordinary.

HIPIII NO#	PROJECT:
2019056	Twisp Floodplain Phase II Implementation
EXPLANATION	The Twisp Floodplain Phase II habitat project built on previous work to reconnect floodplain and off-channel habitat at river mile 4 to 5 on the Twisp River. This phase of work included removing additional levee, constructing two alcoves with large wood for cover, constructing 200 feet of floodplain channel between an existing pond and wetlands, replacing a culvert over a wetland outlet with a bridge, and planting riparian vegetation.

2019019(Twisp River) Levee Removal

2019019(Twisp River) Alcove

Adaptive Management of Previous Projects

Adaptive management of previously completed work. In 2017043, Idaho Department of Fish and Game (IDFG) hired a contractor to install large wood structures in the North Fork Salmon River on the Hutton-Murphy (H-M) and Dedmon-Kozacek (D-K) properties. Structures installed included channel-spanning log weirs, engineered logs jams, rock barbs, and boulder fields.

IDFG staff have been monitoring the project and have noticed significant scour around some of the channel-spanning weirs structures since installation. Although the purpose of the weirs is to promote and maintain pools in reaches of the North Fork Salmon River that currently lack pool habitat, the scour occurring at the H-M and D-K weirs are undermining the stabilization of the logs, may pose a strainer hazard, and could possibly limit fish passage at low summer flows, although this has not been observed. The logs do not appear mobile or detached from their anchor points.

HIPIII NO#	PROJECT:
2019073	North Fork Habitat Improvement Hutton/Murphy and Dedmon/Kozacek Repair
EXPLANATION	IDFG repaired 7 channel spanning weirs on the Hutton/Murphy property. The repairs included removing of one or both weir logs, compacting the bed location, replacing the logs, and filling in with fine material. Large boulders were placed in the plunge pool area to create complexity in velocities. The repairs included removing of one or both weir logs, compacting the bed location, replacing the logs, and filling in with fine material. Large boulders were placed in the plunge pool area to create complexity in velocities. The restoration site will be monitored yearly to evaluate plant growth and make sure the structures are functioning properly. Fish surveys will also be conducted at the restoration site.

2019073(Weir at Hutton-Murphy at LWM)

2019073(Weir at Hutton-Murphy at LWM)

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.

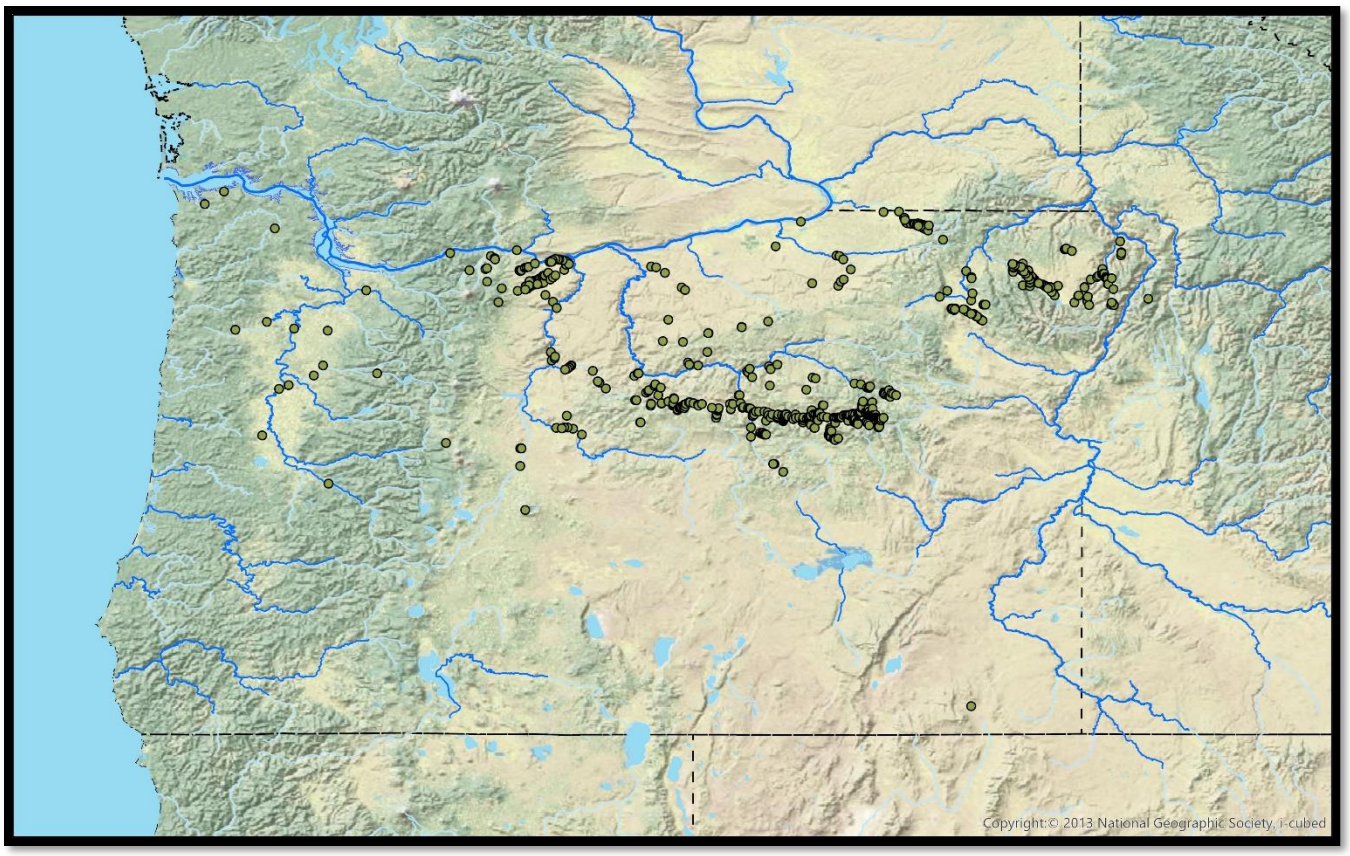
TABLE 13: FISH SCREENS

HIP3 NO#	Project Title	No# of Actions
2019005	**ODFW Operations and Maintenance**	**718**
2019044	**ODFW Fish Screens - Low Risk Projects I**	**16**
2019081	**ODFW Fish Screens - Low Risk Projects II**	**3**

2019 was the third 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 predict 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 where maintenance was anticipated to occur, and a field form for specific actions that caused reportable impacts (turbidity exceedances and take of listed species).

2019044 ODFW Fish Screens

FIGURE 7: 2019 HIPIII FISH SCREEN O&M LOCATIONS



The O&M Oregon Fish Screens (HIPIII No# 2019105) project reported 718 actions with the locations shown in Figure 7. 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.

2019093 (North Fork Teanaway) Large Wood Jam.

2019107 (Beaver Creek) Large Wood Structures