John Day Basin
Partnership

John Day Basin Native Fish Habitat Initiative

VISION

A John Day Basin with clean water and healthy watersheds sufficient to provide for the sustainable ecological, economic, and cultural well-being of the basin.

PARTNERSHIP MEMBERS

Steering Committee

Soil and Water Conservation Districts:
- Gilliam Co. SWCD

Watershed Councils:
- South Fork John Day Watershed Council

Conservation Groups:
- The Freshwater Trust

Tribal Entities:
- Confederated Tribes of the Warm Springs Reservation
- Confederated Tribes of the Umatilla Indian Reservation

State and Federal Agencies:
- Oregon Dept. of Fish and Wildlife
- Umatilla National Forest
- Natural Resources Conservation Service

ECOLOGICAL PRIORITY

Aquatic Habitat for Native Fish Species

FOCAL SPECIES

Middle Columbia summer steelhead

Middle Columbia Bull trout

Middle Columbia River spring Chinook salmon,

Pacific lamprey

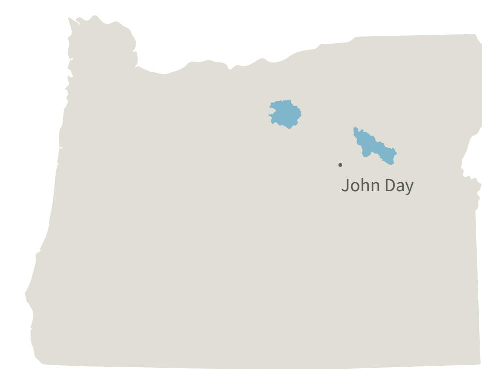
Western brook lamprey

Westslope cutthroat trout

Redband trout

Partner Organizations

Blue Mountain Forest Partners
Blue Mountain Land Trust
Bonneville Power Administration
Burns Paiute Tribe
Confederated Tribes of the Umatilla Indian Reservation
Confederated Tribes of the Warm Springs Reservation
Gilliam County Soil & Water Conservation District
Gilliam East John Day Watershed Council
Grant Soil & Water Conservation District
Mid John Day-Bridge Creek Watershed Council
Monument Soil & Water Conservation District
North Fork John Day Watershed Council
Oregon Department of Agriculture
Oregon Department of Fish & Wildlife
Oregon Department of Parks & Recreation
Ritter Land Management Team
Sherman County Soil & Water Conservation District
South Fork John Day Watershed Council
The Freshwater Trust
Trout Unlimited
U.S. Department of Agriculture, Forest Service, Malheur National Forest
U.S. Department of Agriculture, Forest Service, Umatilla National Forest
U.S. Department of Agriculture, Forest Service, Wallow-Whitman National Forest
U.S. Department of Agriculture, Natural Resource Conservation Service
U.S. Department of Interior, Bureau of Land Management
U.S. Department of Interior, Bureau of Reclamation
U.S. Department of Interior, Fish & Wildlife Service
Wheeler County Soil & Water Conservation District



GEOGRAPHIC SCOPE

The John Day Basin Partnership's geography encompasses the entire John Day River Basin. The John Day River Basin spans 8,100 sq. mi. and with ~284 undammed miles, the John Day is the longest, free-flowing river in Oregon.

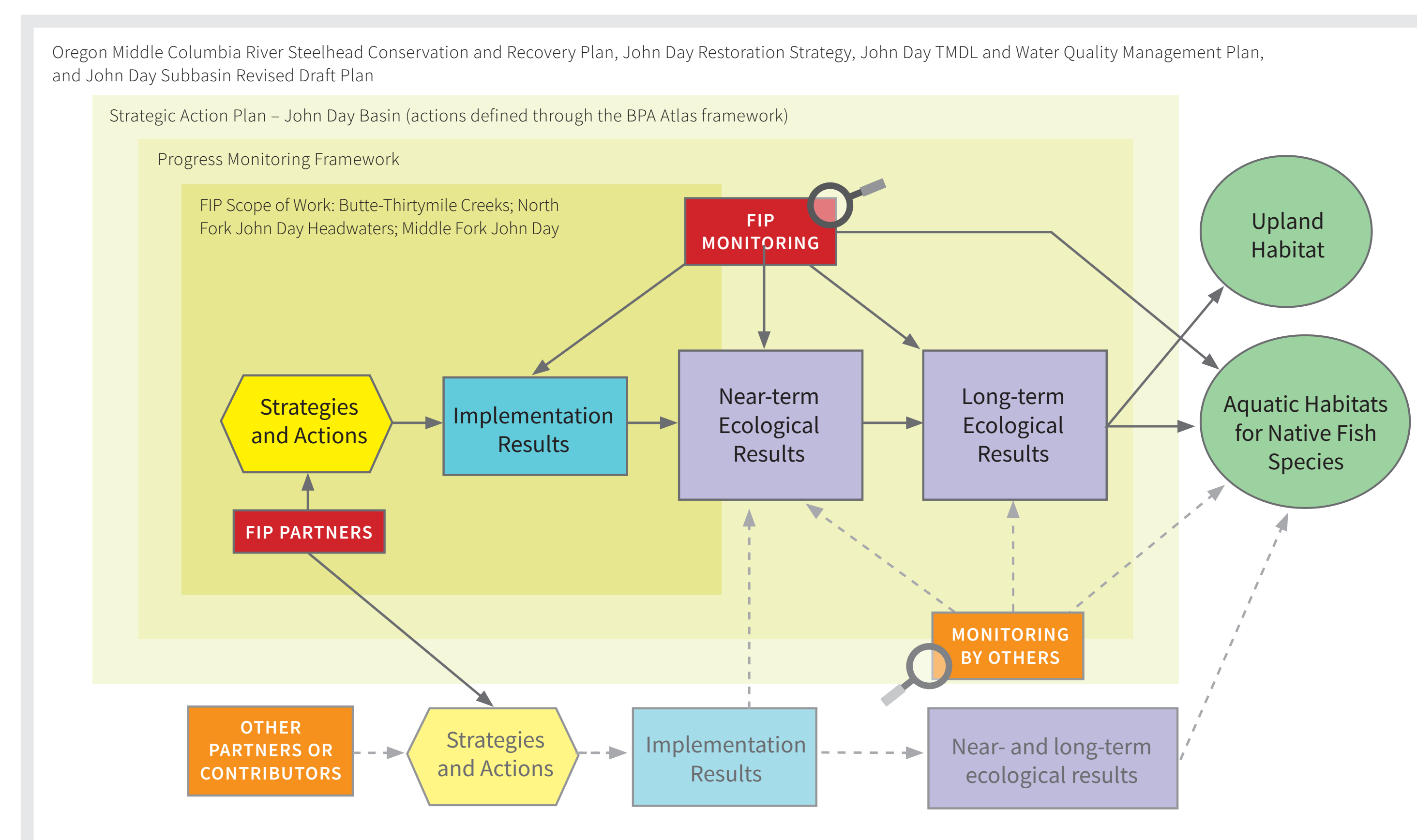
The Partnership's Initiative Geography includes ***three priority focus areas*** (Initiative watersheds) within the basin:

1 Butte-Thirtymile Creeks in the Lower Mainstem John Day;
2 North Fork John Day Headwaters; and
3 the mid-upper Middle Fork John Day.

Operational Context

The John Day Native Fish Habitat Initiative is nested within a larger regional recovery effort described in the Oregon Middle Columbia River Steelhead Conservation and Recovery Plan (ODFW; NMFS), Recovery Plan for the Coterminous United States Population of Bull Trout (USFWS), the John Day River Restoration Strategy (CTWSRO), the John Day TMDL and Water Quality Management Plan (ODEQ), and the John Day Subbasin Revised Draft Plan (NWPCC). While the geographic scope of the Strategic Action Plan encompasses the entire John Day Basin, actions occurring in the 6-year FIP scope of work are focused in three subwatersheds – Butte-Thirtymile Creeks; North Fork John Day Headwaters; and Middle Fork John Day. Projects in these watersheds as well as the larger basin have been identified by the BPA Atlas framework (Figure 1).

Figure 1: Operational context of the OWEB-funded Focused Investment Partnership Initiative



Theory of Change

SITUATION

The John Day River Basin is a highly valued and unique region rich in natural resources, wild fisheries, small communities, native cultures, and unmatched viewsheds. It is the third longest free-flowing river in the continental US and its native fish populations are relatively free from hatchery influences.

A broad array of historical and present-day land and water use practices (e.g. mining, logging, livestock grazing, fire suppression, river channel and riparian modifications, irrigation water withdrawals, and invasive species introductions) and a changing climate have altered the condition and function of the aquatic and upland ecosystems of the John Day River Basin. An important result has been a substantial reduction in the productivity and status of native fish populations and the subsequent listing of many species under state and/or federal protections (e.g. Federal Endangered Species Act, Oregon sensitive-critical species). This situation has motivated landowners, tribes, communities, resource agencies, and conservation organizations to come together and collaboratively take action to improve land use practices and plan, design, and implement projects that address the following key limiting factors:

- Altered hydrology *(low instream flows)*
- Degraded water quality *(elevated temperature, dissolved oxygen, bacteria, sedimentation, biological criteria)*
- Degraded floodplain and channel structure *(pools, connectivity, diversity)*
- Degraded riparian communities
- Impaired fish passage
- Altered sediment routing
- Altered condition of upland habitats

APPROACH

The results chain (Figure 2) articulates the partnership's theory of change by displaying the relationships between strategies, implementation results (outputs), and near- and long-term ecological results (outcomes) partners predict will occur in response to strategy implementation that will ultimately lead to achieving goals associated with the partnership's ecological priorities.

Numbered results identified in Figure 2 are those the partnership has selected to be part of a progress monitoring approach. Measuring these results over time will allow the partnership to evaluate progress in both the near (e.g. 6-year FIP timeframe) and long term, and to identify where key uncertainties might exist with regards to confidence of predicted outcomes or relationships between results.

Each numbered implementation result is associated with the corresponding objective in the Strategic Action Plan (Tables 1 and 2). For intermediate ecological outcomes, objectives are included if identified; however, for many ecological results, the degree to which they will be achieved is not yet well understood. Given this complexity, continued assessment and planning will be required to support development of specific, measurable objectives for the desired ecological outcomes.

The narrative below summarizes the resulting theory of change. Implementation outputs and ecological outcomes prioritized for monitoring during the six-year FIP timeline are indexed to correspond to the results chain (Figure 2) and measuring progress tables (Tables 1 and 2).

1 Dedicate land and water to restoration and preservation of stream habitat

Partners will work with willing landowners to enter into contractual agreements such as conservation easements on working lands or flow agreements to protect core fish habitat[1].

Theory of Change.
Land acquisitions and conservation easements[1] promote land and water use practices that protect high-quality upland and aquatic habitat from degradation. Acquisition (lease or purchase) of water rights reduces the volume of water diverted for out of stream uses thereby increasing stream flow. Increased flow improves habitat connectivity and provides fish access to thermal refugia, buffering impacts of climate change.

2 Reconnect floodplains

This strategy consists of actions that seek to reactivate floodplains including breaching, removing, or setting back existing levees or projects to construct floodplain topography by excavating floodplain benches in new or existing channels[2].

Theory of Change.
Removing levees or other infrastructure[2] that has disconnected floodplains from river and stream channels will promote the reactivation of floodplain habitat, restore a functional hyporheic zone, and encourage reestablishment of floodplain and riparian vegetation. Increasing the connectivity and quantity of floodplain habitat (and associated seasonal wetlands and off- and side-channels) accessible to summer rearing and overwintering juvenile salmonids will improve their survival throughout the year and increase the abundance of emigrating smolts and therefore the overall productivity of fish populations. Active floodplains also contribute to improving water quality by promoting the settling of fine sediments and improving surface/ground water interactions.

3 Riparian restoration and management

Riparian restoration actions will include removal of non-native plant species and revegetation of riparian areas with native plant species to establish adequate stream buffer strips[3]. This strategy also will support the design and implementation of grazing practices including installation and maintenance of livestock exclusion fencing[3] and off-stream watering systems.

Theory of Change.
Reestablishing native plant communities[3] in riparian areas (and removal of non-native plants) will promote the production of terrestrial food organisms and the input of organic material into aquatic systems that then support aquatic macroinvertebrate populations. An increase in the production of terrestrial and aquatic food resources will improve growth and survival of rearing native fish.

Functional riparian areas also aid in nutrient mediation and increase bank stability. These improved functions will reduce the input of nutrients and reduce erosion rates that deliver fine-grained sediments into streams. A reduction of sediments will reduce gravel embeddedness improving spawning gravel quality and therefore improve spawning success and egg to fry survival. Sediment mediation in riparian zones also contributes to improved sediment dynamics and composition necessary for the overall quality of diverse and complex aquatic habitats[10].

Over time, restored riparian areas also become sources for large-sized woody material that become key elements for the creation and maintenance of stream habitat. Large-sized wood complexes help sort sediment and trap organic material – also necessary functions to maintain diverse and complex habitats[10] for fish and the macroinvertebrates that provide their primary food source. Shading from restored healthy riparian zones[7] reduce direct solar radiation in streams and therefore play a role in lowering stream temperatures[9]. Finally, improved riparian areas contribute to supporting upland functions and processes and the upland species that depend on them.

Superscript numbers [1-17] can be cross referenced on the Results Chain diagram and the Implementation Progress/Ecological Progress tables on the following pages.

4 Channel modifications and side-channel/ off-channel restoration

This strategy is focused primarily on beaver restoration management[4] in areas where they are currently absent but historically present and active reconstruction of physical habitat in stream channels and associated side- and off-channel areas. These projects will create pools and riffles and restore desired stream channel configurations by reconnecting meanders where streams have been channelized and straightened.

Theory of Change.

The reintroduction of beavers[4] in appropriate locations will promote their recolonization and lead to an increase in the quantity of deep pools and reactivate side and braided channel networks. The cumulative long-term outcome of all these actions and near and medium-term results is an improvement in the diversity, complexity, and structure of aquatic habitats[10] – supporting all freshwater life history stages of native fish and the overall productivity of their populations.

Targeted pool and riffle construction will restore a more desirable distribution of these habitat types and increase summer rearing opportunities for native fish. The reconstruction of stream channels and reconnection of meanders to historical configurations will reactivate side and braided channel networks and also contribute to the development of a desired distribution of riffles and pools.

5 Install large woody debris structures and rock weirs

This strategy consists of the installation of large woody debris or rock weir structures where appropriate[4].

Theory of Change.

Large woody debris complexes and rock weirs[4] will promote evolution of deep pools and riffles, increasing the quantity and distribution of these habitat features. These outcomes provide increased summer rearing habitat for fish and ultimately contribute to the increased creation and maintenance of diverse and complex aquatic habitats[10].

6 Fish passage restoration

The implementation of this strategy consists of removal or remediation of artificial barriers to fish passage[5]. Barriers include structures such as dams (including seasonal push-up dams), culverts, and irrigation diversions – where fish screens and associated bypass systems will be installed to reduce the entrainment of juvenile fish.

Theory of Change.

Removal of artificial barriers[5] to fish will improve the migratory or seasonal movement of fish and therefore increase habitat connectivity, access to thermal refugia, and the spatial distribution of native fish[8], buffering impacts of climate change.

Installation of fish screens at points of diversion will reduced entrainment and overall rates of mortality of juvenile fish – increasing the overall productivity of fish populations.

7 Water quality and water quantity impacts

This strategy consists of a variety of actions to improve water quality and water quantity. To improve water quantity, partners will negotiate and complete flow transactions with water users (through lease or purchase)[6] and collaborate with agricultural producers to design and implement irrigation efficiency projects[12]. To address water quality, the partnership will implement projects that reduce or eliminate point source (e.g. heavy metals, pesticides, herbicides, sedimentation, or other contaminants) and nonpoint source pollution (road caused sedimentation).

Theory of Change.

Flow transactions[6] and irrigation efficiency projects will increase surface flow[11] in targeted streams and contribute to restoring a more desirable hydrograph (one that more closely approaches natural conditions) and improve conditions for all life history stages for native fish. A restored hydrograph will help restore the stream temperature[9] regime thereby improving the quality of summer rearing habitat, including increased dissolved oxygen levels. It will also reduce the frequency and severity of scouring flows and help to maintain quality of aquatic habitats.

Road decommissioning and removal will increase floodplain connectivity and floodplain habitat which supports overwintering fish, as well as reduce road related erosion and sedimentation and the quantity of fine-grained sediments entering stream. As a result of reduced sedimentation, gravel embeddedness is reduced and the quality of spawning gravel is improved – leading to more successful spawning and greater egg to fry survival. A reduction in fine sediments will also decrease nutrient loading from agricultural runoff.

8 Implement upland restoration actions

Upland restoration actions are a critical strategy in the Partnership's ridgetop to ridgetop restoration approach. However, implementation objectives will not be defined until after upland and terrestrial scoping, mapping, and prioritization is completed. This process is planned for Fall 2019.

Partners (including agency staff) will work with private and public landowners to implement actions to restore healthy upland crop, range, and forest lands that benefit ecological and human communities. These actions include: fuels management (including thinning, prescribed fire, and fuel breaks); use of conservation tillage and cover crop practices; management to control non-native plants and juniper; and implementation of grazing and livestock Best Management Practices (BMPs) such as fencing, establishing off-stream water, and installing and maintaining riparian buffers on fish bearing streams.

Theory of Change.

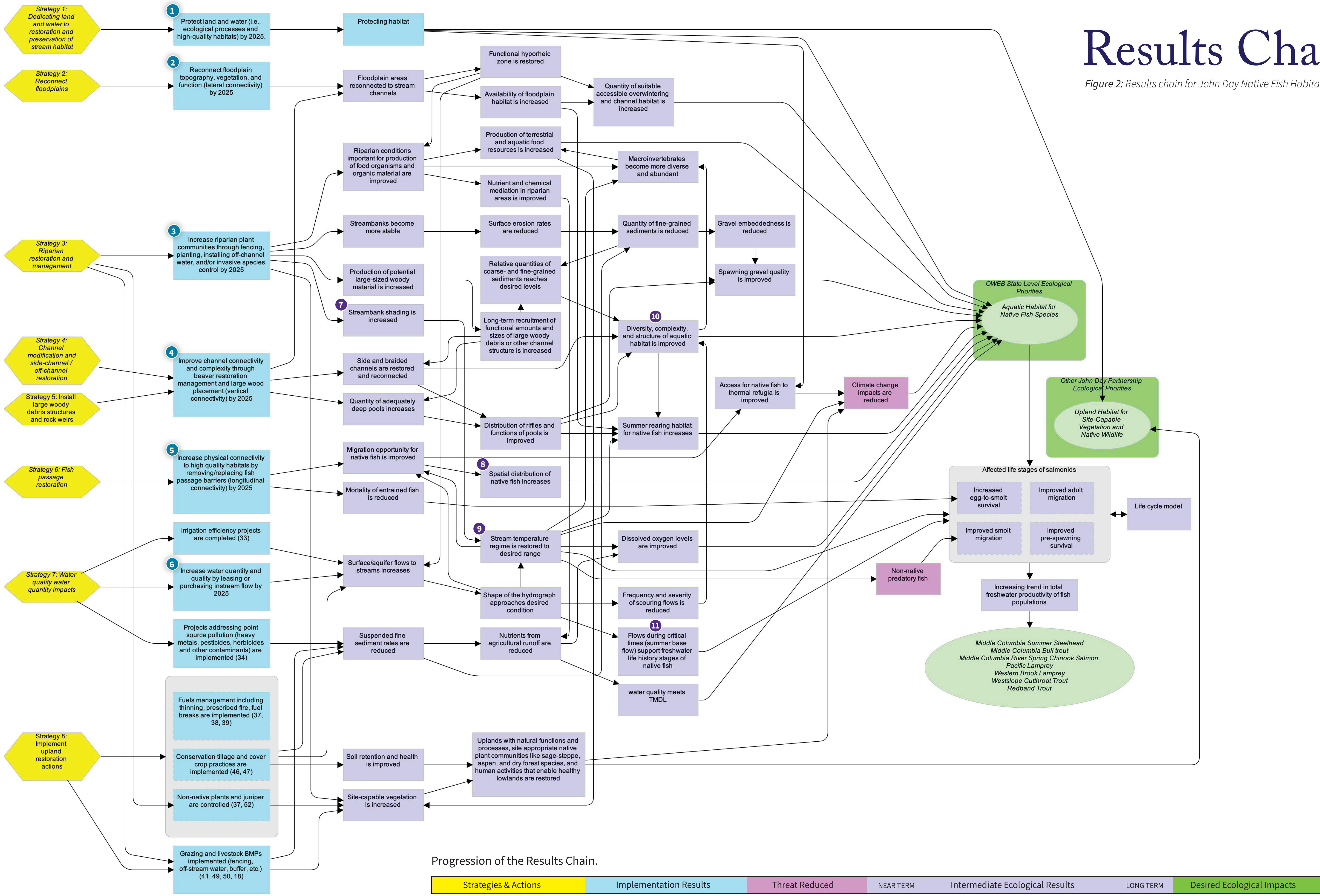
Conservation tillage and cover crop practices improve soil retention and health; controlling non-native plants and juniper allows diverse native plant communities (site-capable vegetation) to become re-established; and grazing and livestock BMPs protect and promote site-capable vegetation. Healthy, intact soil and diverse, native plant communities enable natural upland functions and processes, ultimately providing upland habitat for site-capable vegetation and native wildlife, supporting land uses compatible with healthy, functioning lowlands, and buffering impacts of climate change.

When implemented together, fuels management, conservation tillage and cover crop practices, non-native and juniper control, and grazing and livestock BMPs increase surface and aquifer flows to streams and reduce suspended fine sediment in streams.

Superscript numbers [1-11] can be cross referenced on the Results Chain diagram and the Implementation Progress/Ecological Progress tables on the following pages.

Results Chain

Figure 2: Results chain for John Day Native Fish Habitat Initiative



OUTPUTS

Implementation Progress

Table 1. Implementation results objectives and metrics. The result numbers correspond to results shown in the results chain (Figure 2) and theories of change. Numbers in parenthesis indicate actions defined in the John Day Atlas.

	IMPLEMENTATION RESULTS	OBJECTIVES BY 2025	METRICS
1	Protect land and water (i.e., ecological processes and high-quality habitats) by 2025. (1)	**Butte-Thirtymile Creeks:** water, land, and protection projects are completed **North Fork John Day Headwaters:** water, land, and protection projects are completed **Upper Middle Fork John Day:** water, land, and protection projects are completed	# or easements / acquisitions Acres protected Cfs protected Linear stream miles protected Protection timeframe
2	Reconnect floodplain topography, vegetation, and function (lateral connectivity) by 2025. (7, 8, 9,10)	**Butte-Thirtymile Creeks:** 15 miles of floodplain reconnected **North Fork John Day Headwaters:** 15 miles of floodplain reconnected **Upper Middle Fork John Day:** 15 miles of floodplain reconnected	Acres treated Linear miles of stream treated
3	Increase riparian plant communities through fencing, planting, installing off-channel water, and/or invasive species control by 2025. (17, 18, 19, 20, 21)	**Butte-Thirtymile Creeks:** 12 miles of stream treated, 30 dev **North Fork John Day Headwaters:** 15 miles of stream treated **Upper Middle Fork John Day:** 12 miles of stream treated	Linear miles of stream treated # of streambanks treated Buffer width
4	Improve channel connectivity and complexity through channel modification and side channel restoration, beaver restoration management, and large wood placement (vertical connectivity) by 2025. (3, 4, 5, 16, 28)	**Butte-Thirtymile Creeks:** 15 miles of stream treated **North Fork John Day Headwaters:** 12 miles of stream treated and 36 structures installed **Upper Middle Fork John Day:** 15 miles of stream treated and 36 structures installed	# of structures installed Linear stream miles treated # of pools and riffles created
5	Increase physical connectivity to high quality habitats by removing/ replacing fish passage barriers (longitudinal connectivity) by 2025. (22, 23, 24, 25)	**Butte-Thirtymile Creeks:** 4 barriers removed or replaced **North Fork John Day Headwaters:** 5 barriers removed or replaced **Upper Middle Fork John Day:** 5 barriers removed or replaced	# of barriers removed / replaced / screened Total stream miles made accessible to the next upstream barrier or likely limit of habitable range
6	Increase water quantity and quality by leasing or purchasing instream flow by 2025. (31)	**Butte-Thirtymile Creeks:** flow transactions completed **North Fork John Day Headwaters:** flow transactions completed **Upper Middle Fork John Day:** flow transactions completed	cfs transferred instream Total linear miles of improved for flow as measured from point of diversion to next downstream diversion or river confluence *(whichever comes first)*

OUTCOMES

Ecological Progress

Table 2. Ecological results potential objectives and potential metrics. The result numbers correspond to results shown in the results chain (Figure 1) and theories of change. Given the complexity of ecosystems, continued assessments and planning will be required to support development of specific, measurable objectives for desired ecological outcomes.

	LIMITING FACTOR REDUCTION OR INTERMEDIATE ECOLOGICAL RESULTS	POTENTIAL OBJECTIVES	POTENTIAL METRICS
7	Streambank shading is increased	*Increase in woody species density and stream shade potential*	Percent riparian vegetation over 6ft within 60ft buffer of treatment areas (LiDAR/UAV Surveys) Percent solar access at random transects in Thirtymile Creek, Desolation Creek, Middle Fork John Day. Density of woody stems <1m and >1m tall between treatment and control locations.
8	Spatial distribution of native fish increases	*Increasing trend in linear miles of juvenile summer steelhead and spring Chinook summer rearing habitat by 2025*	Linear extent (km) of the mainstem Middle Fork John Day occupied by Chinook parr during August snorkel surveys. Linear extent (km) of Thirtymile Creek occupied by juvenile steelhead during end of summer surveys. Linear extent (km) of the Desolation Creek occupied by Chinook spawning surveys during the fall and steelhead spawning surveys in Spring
9	Stream temperature regime is restored to desired range	*Decreasing trend in summer instream water temperature by 2025*	Seven-day average daily maximum temperature at long-term monitoring sites in each of the Mainstem Middle Fork John Day, Desolation Creek, Thirtymile Creek.
10	Diversity, complexity, and structure of aquatic habitat is improved	*Create an aquatic-riparian system sufficient to provide necessary stream shading, and organic material for in-stream structural and metabolic processes.* *"Increase geomorphically and seasonally appropriate sinuosity, floodplain and pool/riffle habitat, and structure to maintain habitat and provide fish cover."*	Habitat diversity index used in all three of the focal FIP geographies.
11	Flows during critical times (summer base flow) support freshwater life history stages of native fish	*Increasing trend in summer instream flow by 2025 (Contributing Ecological Objectives)*	MFJD: July-August mean and minimum discharge at the Ritter USGS gauging station. Thirtymile Creek: percent of total stream length downstream from Hwy. 19 with surface water during July-August base flow. Desolation Creek: CTUIR installed gauging station near mouth of Desolation, pressure transducer

Status & Trends

ECOLOGICAL PRIORITIES	GOALS
Aquatic Habitat for Native Species	**1** Increasing trend in summer steelhead freshwater productivity in Butte-Thirtymile Creeks by 2025. **2** Increasing trend in summer steelhead and spring Chinook freshwater productivity in the North Fork John Day Headwaters by 2025. **3** Increasing trend in summer steelhead and spring Chinook freshwater productivity in the Upper Middle Fork John Day by 2025.