Idaho Water Transactions Program Progress Report

Project No: 2008-608-00

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Morgan Case – Idaho Department of Water Resources, Coeur d'Alene, Idaho

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Project Goal: To improve tributary flows in the Lemhi and Pahsimeroi River Basins.
Objectives: To develop water transactions with willing water right owners.
Hypothesis: Using voluntary, market-based transactions provides incentives for restoring stream flow, while protecting the local rural economy.

Contract Work Elements Status:
WE A: 185 – Periodic Status Reports for BPA – Up to date.
WE B: 119 - Manage and Administer Projects – Work ongoing.
WE C: 114 – Identify and Select Water Transactions for Development – Work ongoing.
WE D: 157 – Collect/Generate/Validate Field and Lab Data for Water Transactions – 2014 Field data collected, 2015 field work planned.
WE E: 154 – Develop and Negotiate Water Right Transactions – Work ongoing.
WE F: 174 – Strategic Plan Development – Work ongoing.
WE G: 191 – Local Watershed Coordination (USBWP) – Work ongoing.
WE H: 165 – Produce Environmental for Collecting Field Monitoring Data
WE I: 132 Submit Annual Report for the Period (Oct 1, 2012) to (Sep 30, 2013) - Completed
WE J: 132 Submit Progress Report for the Period (Oct 1, 2013) to (Sep 30, 2014) – Complete with the submission of this report.
WE K: 164 – 102c-08 Lemhi Permanent Cerise/TNC – On hold.
WE L: 164 – 72i-14 Lower Lemhi 2014-2015 – Lemhi transaction finalized; flow protected instream. Bohannon Creek deal added to WE to protect flow early season for spawning steelhead.

A. Introduction/Background Information:

The Idaho MOA/Fish Accord Water Transaction Program works to improve instream flow to enhance habitat for the benefit of threatened and endangered anadromous and resident fish species. Water transactions provide an effective and appropriate response to address inadequate stream flows, often cited as a key factor limiting the productivity of both anadromous and resident fish species.

The MOA Idaho Water Transactions Program will complement the Columbia Basin Water Transactions Program (CBWTP) and will utilize the transaction tracking and procedural aspects of CBWTP to enhance the effectiveness of implementation. The basis of the funding is the MOA signed between the Action Agencies and the state of Idaho for Idaho-specific projects addressed in the Biological Opinion issued in 2008.

The primary goal of the Idaho MOA/Fish Accord Water Transactions program is to fund the acquisition of interests in water rights for use in restoring stream flow to ecologically significant reaches in the Lemhi and Pahsimeroi River basins.

As a result of legal water withdrawals during the peak irrigation season, stretches of the mainstem Lemhi and Pahsimeroi Rivers and their tributaries run low - and sometimes dry - in summer and early fall with significant consequences for imperiled salmon, steelhead, trout, and other aquatic species. The Upper Salmon Subbasin Plan and other habitat assessment plans cite inadequate stream flows as a key factor limiting the productivity of both anadromous and resident fish species. Often, the inadequate stream flows are the result of the competing out of stream water uses, primarily crop irrigation. Voluntary, market-based water transactions provide an effective, appropriate, and fair response to balance the competing out of stream uses of water with the need to address this key limiting factor. Restored stream flows benefit multiple species including Chinook salmon, steelhead, and bull trout.

Water transaction development under the Idaho MOA/Fish Accord Water Transaction Program will utilize the transaction tracking and procedural aspects of CBWTP to enhance the effectiveness of implementation. Using temporary and permanent acquisition of water rights, and other incentive-based approaches, to assist landowners who wish to voluntarily restore flows to key fish habitat.

Restoring flows for fish through water transactions includes acquiring temporary and permanent interests in water rights. These interests are secured through a variety of mechanisms including the conversion of agricultural practices (e.g., source switches), the conversion of agricultural lands to other land uses, or the acquisition of land or interests in land for riparian restoration. The IWRB focuses its efforts in areas where restoring stream flows will benefit critical life history stages of anadromous and resident species in priority areas throughout the Lemhi and Pahsimeroi River basins. IWRB staff works on the ground in the Upper Salmon to identify, develop, and negotiate water transactions that result in flow restoration. Technical support for transactions comes through the Upper Salmon Basin Watershed Program Technical Team (tech team), which is made up of hydrologists, fisheries biologists, program managers, and engineers from federal, state, county, non-profit, and tribal entities. Staff then submits the proposals to the Idaho Water Resource Board, the Idaho Salmon Recovery Team, and the CBWTP for funding consideration and evaluation. Using criteria approved by the Independent Scientific Review Panel (ISRP) and a ranking sheet based on the same, CBWTP reviews and ranks each transaction proposal to ensure each transaction provides benefits to stream flows. The CBWTP makes funding

recommendations to BPA, and obtains BPA approval, before OSC disburses transaction funds under this program. The IWRB ensures effective implementation of funded projects and compliance with the National Environmental Policy Act through coordination with local partners.

Since 2008, the IWRB in cooperation with OSC, NFWF, BPA and a multitude of other program partners and cost share sources have completed over 20 water right transactions that have restored over 62 cubic feet per second of flow to key streams in the Lemhi and Pahsimeroi River Basins. These transactions have included several innovative methods, including short and long-term leases, source switches, permanent purchases, and voluntary diversion reduction agreements. The term of these deals has varied from short-term to permanent.

Problem Statement:

The Lemhi and Pahsimeroi basins are typically arid and semi-arid during the summer and early-fall because much of the area's stream flow comes from snow melt in the mountain ranges during this season. Stream flow across the area naturally declines as the snowpack disappears, resulting in the lowest flow season (typically July through September) for most rivers and streams. Most, if not all the remaining flow in numerous streams is legally diverted by farmers and ranchers for irrigation of crops, particularly feed for cattle (over half of the water diverted in the basin is for alfalfa, grass hay and pasture). On many streams, more rights to divert water were issued than water is available to satisfy these rights during the low-flow season. Such appropriation has led to many streams becoming depleted or entirely dewatered, particularly during the summer and early-fall.

Many rivers and streams throughout the Basin suffer from low instream flow, significantly depressing both anadromous and resident fish production. Inadequate flow is one of several limiting factors that have contributed to various salmonid populations being listed as endangered or threatened under the Endangered Species Act.

Thus, adequate instream flow during all freshwater life history stages is critical for ensuring recovery and sustainability of anadromous and resident fish and other aquatic species. The IWRB seeks to benefit one or more of these life history stages through flow restoration efforts including flow restoration to provide downstream migration, adult salmonid access to spawning areas, to support proper incubation of eggs in redds, and benefit rearing of fry, parr and smolts. In general, the primary life history stage that is most frequently benefited is juvenile salmonid rearing through improved flow during the naturally low flow season (summer or early-fall). Increases in instream flow can result in higher food production, cooler water temperatures, decreased predation and competition, and increased cover opportunity for juvenile salmonids. Restoration of flow to benefit each of these life history stages represents distinct ecological objectives of the project (Project Objective).

While the IWRB participated in the CBWTP's first five years of implementation, the program was focused primarily on funding and supporting transactions and not on monitoring achievement of specific ecological objectives. The evaluation of the CBWTP in late-2007 by an independent evaluator (Hardner and Gullison 2007) recommended increased focus on demonstration of ecological results of flow restoration projects. Hardner and Gullison recommended that the CBWTP "augment existing performance metrics to include measures of progress towards achieving biologically-based flow targets, and overall habitat restoration" and "develop guidelines and standards for habitat monitoring." In response, the CBWTP formed a monitoring subcommittee to develop appropriate monitoring protocols. The CBWTP has finalized its flow compliance monitoring protocols and will next focus on developing biological

monitoring protocols in FY 2013. These protocols will contain clearly defined success criteria for determining whether the relevant project objective(s) is met for a given transaction. Project objective(s) (and relevant success criteria) will be set by IWRB staff for each proposed transaction or specific stream reach under a logic model.

Benchmarks for evaluating results of water transactions can be set in terms of flow, habitat, and population response. As noted above, the Program is currently assessing and cataloguing flow and biological monitoring techniques for eventual development of specific reporting protocols in FY 2014. Even in the absence of formal flow and biological protocols, IWRB staff has experience with such monitoring, with regards to flow monitoring. The following project objectives are based on results currently monitored by IWRB or project partners.

Flow monitoring is critical to determining whether established flow targets are being met. Specific flow targets have already been established for several priority stream reaches under the 2010-2013 FCRPS BiOp Implementation Plan released on June 10, 2010. There are two distinct ways of measuring flow, the first being the rate of flow at a specific point at any given moment in time and the second being the total volume water instream over a defined period of time. Biological monitoring is critical to estimating the impact to habitat and population response of incremental increases of flow in a defined reach. Several techniques, described below, exist for evaluating such biological response. Isolating the impact of the flow on population response is more difficult, particularly for anadromous fish, given all the other factors limiting such response.

Where in general the work will be done, for how long, and by whom?

Water transactions will be developed in flow-limited reaches of the Lemhi River and tributaries and the Pahsimeroi River and tributaries. Projects will be prioritized according to CBWTP criteria and a host of considerations. Those criteria include identification of stream flow as a limiting factor in local subbasin plans where such plans are available or as identified in other significant planning documents (Stream Habitat Improvement Prioritization in the Upper Salmon Subbasin, Lemhi Framework, etc.), availability of local project partners, presence of efforts to concurrently address the other limiting factors, and willing landowners with sufficient water rights to make work in that area cost effective for achieving the desired ecological improvements. The IWRB is in the process of developing logic models and/or strategies for each of the tributaries where it works to ensure its activities are meeting appropriate conservation flow targets, including metric goals and improvements in flow related limiting factors.

How will the effectiveness of your work be monitored?

The IWRB will be following the Accounting Framework developed by the CBWTP to monitor contract compliance, flow improvements, and habitat response for water transactions implemented under this project. The framework places each transaction into one of the following monitoring tiers according to specific criteria.

Tier 1 - Contractual Compliance – Requirements for Tier 1 ensure that the legal terms of each transaction are met. All transactions are included within Tier 1 and must fulfill annual reporting requirements as defined by the transaction type (e.g., lease, purchase, split season). Where flow monitoring is mandated by deal structure, the transaction will automatically qualify for Tier 2a – Flow Compliance.

Tier 2 - Flow Compliance – This tier accounts for the flow instream from the point of diversion and/or throughout the entire reach.

Tier 2a – Point of Diversion (POD) – Transactions must account for the flow added to the

protected stream reach at the POD.
Tier 2b – Reach – Transactions must account for the flow added to the protected stream reach from the POD along the specified length of the protected reach before, during, and after the period of ecological significance, as defined by the objective of the transaction in addressing the key limiting factor of flow for identified and targeted species.
Tier 3 - Limiting Factors – Transactions that fall within this tier must track changes in flow-related limiting factors by accounting for aquatic habitat metrics along a specified section of the protected reach during the period of ecological significance. This period is defined by the objective of the transaction in addressing key limiting factors that are unique to the location and purpose of the transaction. A monitoring and accounting strategy will be required for each transaction placed within this tier.
Tier 4 - Aquatic Habitat – This tier integrates transaction and flow-specific monitoring data gathered in Tiers 1, 2a, 2b, and 3 with broader monitoring efforts in priority regions throughout the Columbia Basin. Monitoring efforts in this tier will be structured in specific basins where CBWTP transaction(s), Columbia Habitat Monitoring Program (CHaMP) sites, and other local monitoring efforts overlap to evaluate changes in flow-related habitat characteristics that are examined within the context of broader-scale biological conditions and, where possible, fish population dynamics. The findings of this tier will also be adaptively applied to inform and fine-tune the overall CBWTP Accounting Framework.

Most transactions in this project will fall into Tier 3 or 4 due to the existing CHaMP and ISEMP monitoring being conducted by project partners. IWRB staff will collect compliance and flow data and work with IDFG to coordinate habitat and biological monitoring.

B. Discussion of Completed Work:

The Idaho MOA/Fish Accord Water Transactions project restores flow on ecologically significant rivers and streams through funding of voluntary water right transactions between landowners and the Idaho Water Resource Board (IWRB). The program is an expansion of the Columbia Basin Water Transaction Program (CBWTP). BPA established the CBWTP in FY 2002 in response to the Biological Opinion for the Federal Columbia River Power System Biological Opinion and Provision A.8 of the Council's 2000 Fish and Wildlife Program. Action 151 of the 2000 Biological Opinion FCRPS stated, in part, that: "BPA shall, in coordination with NMFS, experiment with innovative ways to increase tributary flows by, for example, establishing a water brokerage…To test new approaches to this problem [inadequate streamflows], Bonneville will conduct experiments such as organizing a non-profit water brokerage to demonstrate transactional strategies for securing tributary flow—and, where feasible, addressing water quality—in streams with significant non-Federal diversions."

In 2008 the Biological Opinion was updated and the CBWTP modified its scope to address the newly defined individual Reasonable and Prudent Alternatives (RPAs) that directly relate to flow restoration. RPA 34 addresses tributary habitat implementation from 2007 to 2009 which the program has addressed though work covered under the 2007 – 2009 solicitation. The program is now addressing RPA 35, the next stage of 34, which details a tributary implementation plan from 2010 to 2018 and states, in part, that the action agency, and by extension, the CBWTP, will: "identify additional habitat projects for implementation based on the population specific overall habitat quality improvement still remaining in Table 5 below. Projects will identify location, treatment of limiting factor, targeted population or populations, appropriate reporting metrics, and estimated biological benefits based on achieving those metrics. Pertinent new information on climate change and potential effects of that information on limiting factors will be considered."

The program is able to provide water transaction data to help address RPA 57 which outlines works to evaluate the effectiveness of tributary habitat actions. The IWRB's efforts are associated with subsection 57.2 Lemhi-Study reduce entrainment & provide better fish passage, a pilot study in the Lemhi River Basin to study treatments to reduce entrainment and provide better fish passage flow conditions. (Initiate in FY 2007-2009 Projects) Provision A.8 of the Council's 2000 Fish and Wildlife Program was also updated in 2008. The new language from the Council's 2008 Fish and Wildlife Program support continued funding for the CBWTP by stating in section VIII.D. 2a: "Bonneville established a water transactions program in response to the 2000 Columbia River Basin Fish and Wildlife Program and the 2000 FCRPS Biological Opinion. Bonneville shall fund the continuation of the water transaction program to pursue water right acquisitions in subbasins where water quantity has been identified in a subbasin plan as a primary limiting factor. The water transaction program will continue to use both temporary and permanent transactions for instream flow restoration.

The water transaction program will coordinate with the fish and wildlife agencies, tribes, and project sponsors to:

• Integrate instream water transactions with efforts to set and meet flow targets and habitat restoration goals.

• Integrate instream water transactions with efforts to address other ecological factors that are limiting fish habitat.

• Coordinate with Bonneville on other funding efforts addressing flow restoration to ensure consistency; and

• To the extent possible, consider the potential impact of climate change while making water transaction recommendations.

Bonneville funding of the water transaction program shall continue to accommodate associated transaction costs. In recognition of the timeframes necessary to successfully complete water transactions, Bonneville funding of the water transaction program within a given year shall be carried forward into the next year where a water right transaction has been proposed to the water transaction program but could not be completed in the same fiscal year. The water transaction program will seek closer integration of land and water protection acquisition activities." In addition to the language from the above documents, the local state, and regional documents reference flow restoration activity. The Salmon Subbasin Management Plan (NWPCC 2004, p. 63-69) outlines the following problems and aquatic objectives for the Pahsimeroi and Lemhi Basins: Problem 29: In the Pahsimeroi River Valley, all mainstem tributaries are disconnected throughout the year because of water diversions and the geology of the valley. The disconnection has resulted in alterations to the mainstem Pahsimeroi' s (mouth to Hooper Lane) hydrologic regime (i.e., peak and base flows and flow timing) and has created barriers to migration.

* Aquatic Objective 29A: Mimic or rehabilitate the natural hydrographs of streams in the Pahsimeroi watershed.

* Aquatic Objective 29B: Reconnect mainstem tributaries and modify diversion structures as needed to provide for chinook and steelhead migration. Problem 33: Streamflow withdrawals and the geology of the valley act to disconnect virtually all the Pahsimeroi tributaries from the mainstem, year-round. The loss of water affects base flow conditions and subsequently migration, but also may alter flow timing and to a lesser degree, peak flows.

* Aquatic Objective 33A: Mimic or rehabilitate the natural hydrographs of streams in the Pahsimeroi watershed.

* Aquatic Objective 33B: Reconnect mainstem tributaries and modify diversion structures as needed to provide for chinook and steelhead migration. Problem 35: The hydrologic

regime (peak flows, base flows, flow timing) and connectivity of most Lemhi tributaries has been altered by irrigation withdrawals. Only 7% of all tributaries remain connected to the mainstem. These changes limit resident and anadromous populations' access to potentially available habitat and delay anadromous smolt and adult migration in the lower reaches of the mainstem Lemhi, which may contribute to increased mortality rates, although no evidence has been offered to date.

* Aquatic Objective 35A: Rehabilitate natural hydrographs in key anadromous and resident tributaries to ensure adequate base flows are available in lower, mainstem reaches (i.e., mouth to Agency Creek).

* Aquatic Objective 35B: Provided there is adequate funding, personnel, and landowner participation, reconnect a minimum of one tributary every three years that are currently defined as partially or seasonally inaccessible to anadromous and/or resident focal species.

* Aquatic Objective 35C: Improve irrigation efficiency below diversion L-7 Problem 40: Except for Big Springs Creek, tributaries of the upper Lemhi above Hayden Creek are no longer available to anadromous production because of low flows and diversions. Migration problems can possibly occur year-round, irrespective of irrigation needs. This may be due to the physical obstacle created by the diversion structure and/or the non-removal of the diversion during non-irrigation periods.

*Aquatic Objective 40A: Reconnect mainstem tributaries and modify diversion structures as needed to provide for anadromous and resident migration. Development and implementation of water transactions in the Upper Salmon Basin are accomplished through a strong partnership with IWRB and the Upper Salmon Basin Watershed Program (USBWP). The USBWP technical team uses the following documents when identifying, developing, ranking, and implementing restoration projects in the Upper Salmon Basin:

* Habitat Goals and Priorities (USBWP 2009)

* Screening and Habitat Improvement Prioritization for the Upper Salmon Subbasin (SHIPUSS) (USBWP 2013)

* Draft Section 6 Lemhi Conservation Plan

* 2004 Snake River Water Rights Agreement

* USBWP tech team project ranking forms (USBWP 2008) Water transactions have been implemented as stand-alone projects reviewed by the technical team, or as multi-agency projects involving coordination of timing, permitting, and implementation.

Basin Specific Background - Pahsimeroi River

The Upper Salmon Watershed Project Technical Team, including IDFG Anadromous Fish Screen Program and Regional Fishery Management has prioritized the lower Pahsimeroi River and its major tributary, Patterson/Big Springs Creek, as SHIPUSS Priority I streams. Those are tributaries and river reaches that have the potential to realize immediate, tangible benefits to fish if recovery efforts are directed toward them. Goals in the lower Pahsimeroi River and Patterson/Big Springs Creek are to enhance migration in both streams by increasing flow regimes and reestablishing habitat connectivity to unused stream reaches. Mechanisms for attaining these goals focus on diversion consolidations and removal/alterations of diversions hindering fish passage. (USBWP 2005).

At the request of the Idaho Governor's Office of Species Conservation (OSC) a technical panel with knowledge and expertise of project opportunities within the Pahsimeroi. This team included Paddy Murphy (Fisheries Biologist), Eric Leitzinger, Larry Weeks, Lynn Stratton, Windy Davis, Idaho Department of Fish and Game, Morgan Case and Helen Harrington, Idaho

Department of Water Resources, Mark Olson, Natural Resources Conservation Service, Brian Hamilton, Bureau of Reclamation, Mark Davidson, TNC, Ryan Beaty, Bureau of Land Management Fisheries Biologist, Mike Edmondson, OSC, Chad Fealko NOAA Fisheries and Karma Bragg, Custer Soil and Water Conservation Service. This core team identified the areas of Pahsimeroi with most potential for fisheries enhancement and recovery within the middle Pahsimeroi. Additional support and input is provided by the Custer Soil and Water Conservation District Board of Supervisors. The projects were predominantly in Patterson/Big Springs Creek. Patterson/Big Springs Creek is a very important tributary for spawning and rearing of the unique population of Chinook salmon found in the Pahsimeroi.

The Pahsimeroi River is a tributary of the Salmon River, with a drainage area of approximately 840 square miles. The Pahsimeroi has for many years dried up near Hooper Lane (23 river miles upstream) partially because of surface water irrigation from surface and ground water irrigation diversions. Key habitat limitations in the watershed's bottomland areas include migration problems/blockages and streambed sedimentation. Addressing these limitations will offer an opportunity to enhance the watershed's anadromous salmonids and will clearly benefit other native species of salmonids, other fish, and wildlife. The primary opportunity for addressing these problems in the Pahsimeroi watersheds is through the recovery effort via the Pahsimeroi Contract through OSC, Custer SWCD, IDFG, IWRB, Bureau of Reclamation, NRCS and others and their collaborative efforts on non-federal land. Actions completed by these partners have achieved flow increases in the Pahsimeroi, Patterson/Big Springs Creek, and other small tributaries which combined have improved both habitat and flow up to and above Hooper Lane. A continued coordinated effort through this project will improve flows and habitat further up the Pahsimeroi and above Furey Lane.

The Pahsimeroi River has a unique population of Snake River Chinook salmon, and in contrast with the Lemhi River and East Fork of the Salmon River watersheds, the salmon population in the Pahsimeroi River is a later migrating summer-run Chinook salmon rather than spring-run. Historically, spawning, and rearing habitat was probably supported within the watershed for at least two federally listed anadromous fish species, spring/summer Chinook salmon, and steelhead. (ICTRT)

Priorities for recovery include but are not limited to modifying existing barriers to migration that occur because of either culverts or irrigation diversion structures. As passage barriers at diversions and flow are improved above Hooper Lane, a second priority is to screen diversions to that fish are not entrained in diversions. This will be done via the IDFG Screen program in a coordinated and complementary manner with this project. Another priority will be to improve habitat conditions thus improving in-stream conditions. The improvement goal with a combination of these actions is a 41 percent improvement in the egg to smolt ratio. This is estimated to provide a sufficient recovery strategy over approximately 10 years.

Basin Specific Background - Lemhi River

Beginning in the late 1800’s through the 1900’s, the quality of fish habitat in the Lemhi River watershed has declined and the quantity of habitat has been reduced. Irrigation water diversion, past timber harvest and mining activities, land development with associated clear cutting of riparian vegetation, road development, and livestock grazing have all reduced flow and degraded stream habitat in the Lemhi River, and functionally disconnected tributaries from the mainstem. Dewatering occurs in segments in the lower reaches of most tributaries, effectively blocking migration of adult and juvenile salmonids. Dewatering of the lower Lemhi River can also occur during low water years, impeding fish migration between the Lemhi River watershed and the Salmon River. In addition to impeding fish migration and limiting access to important

habitat, reduced flow resulting from water withdrawals degrades the quality of instream habitat, ultimately negatively affecting fish production, growth, and survival.

For decades, private landowners and water users in the Lemhi River watershed have demonstrated an interest in ensuring their land and water management actions may continue in a manner consistent with the purposes of the Endangered Species Act (ESA) for protection and recovery of Lemhi fish species. Since the late 1980's, numerous on-the-ground improvements to irrigation diversions (with associated fish screening) and riparian habitat have been achieved through the voluntary actions of landowners and water users in conjunction with the Upper Salmon Basin Watershed Project (USBWP; formerly the Lemhi Model Watershed Project) and the Idaho Department of Fish and Game's (IDFG) Anadromous Fish Screen Program. Many of these habitat issues brought forth by landowners were addressed by projects that were developed through the USBWP Technical Team. This Team, comprised of land and resource management professionals representing local, state, federal, tribal, and non-governmental organizations, is responsible for prioritization of such projects using a ranking process that evaluates each action based on its biological benefits to salmonids and their habitat in the upper Salmon River Basin.

Recently, conservation measures developed by collaborators in the Lemhi River watershed have been targeting flow augmentation in the mainstem, flow improvement in dewatered tributary segments, stream habitat improvement (includes riparian protection/restoration and improving instream habitat), and diversion improvements.

These measures are part of a larger scale conservation effort in the Lemhi River sub-basin. The State of Idaho is in the process of implementing a Lemhi Conservation Plan (LCP) and developing a Section 6 Agreement under the ESA with the federal regulatory agencies (National Marine Fisheries Service and the U.S. Fish and Wildlife Service) for the purpose of implementing habitat conservation actions throughout the Lemhi basin to improve instream flow, remove fish passage barriers, and protect and improve riparian and instream habitat. Furthermore, in 2004 Idaho executed a comprehensive water rights settlement between the U.S. government and the Nez Perce Tribe known as the 2004 Snake River Water Rights Agreement. This agreement provides a framework for the development and implementation of habitat conservation actions throughout the Lemhi River watershed. Priority habitat actions prescribed in these agreements include improving mainstem habitat in the Lemhi River where the majority of Chinook salmon production occurs and establishing a functional reconnection between the mainstem and tributaries. Significant progress has been made in completing some of these actions through the implementation of habitat projects. Water transactions, fee acquisitions, and easements are tools that will provide additional opportunities to implement these projects.

The primary limiting factor in the Lemhi watershed is disconnected tributaries, a situation that reduces spawning and rearing habitat quantity for anadromous species and isolates resident fish populations (Northwest Power and Conservation Council (NPCC) 2005). Channel alteration and extensive irrigation diversion impacts the Lemhi drainage. These activities have resulted in steeper gradients, scouring, and redeposition of gravel in the lower river, subsequently raising the riverbed and increasing flood hazards, as well as destroying fish habitat. Only four of the 30 tributaries to the Lemhi River are regularly connected to the mainstem (Figure 1). This project implement transactions that focus on creating partial or full-season connections of the high priority tributaries.

Objectives:

Improve the instantaneous rate of flow through a defined stream reach (OBJ-1)

Measured in cubic feet per second at a defined point or points in the stream reach. Typically, flow is first measured at or just below the historic point of diversion to ensure that the acquired flow is delivered to the start of the defined stream reach consistent with its priority date and relative seniority in the system. Flow is frequently measured at other points in the defined stream reach, including the point of diminishment of the rate of instream flow due to channel losses and/or return flows and downstream at the bottom end of the instream reach. Flow measurement techniques include installation and reading of a staff gage or other gage device and periodic measurement with a flow meter. More frequent monitoring (continual is best) results in more precise and accurate flow data.

Improve the total volume of water restored to a defined stream reach over a period of time (OBJ-2)

Measured in acre-feet at a defined point or points in the stream reach. As with instantaneous rate, flow is first measured at or just below the historic point of diversion and possibly downstream at other points in the stream reach. The difference is that flow must be measured and recorded continually in order to calculate a precise volume of water restored instream during a defined period of time. A fixed gaging station is required to provide this precise level of detail. Estimates of total volume restored can be made based on periodic measurements but the less frequent the instantaneous measurement the less accurate and reliable the total volume measurement.

Improve egg to smolt survival ratio (OBJ-4)

Measured by redd counts to estimate egg production and juvenile screw traps to monitor number, size, and timing of out-migrating fish. Screw traps also provide an opportunity to place Passive Integrated Transponder (PIT) tags into wild salmonids, which can then be used to assess their migration out of the Columbia River System (if arrays are present) and subsequent return to spawning grounds.

Increased off-channel habitat (OCH) (OBJ-5)

Increased flow can “water-up” OCHs where juvenile fish can find refuge. OCHs provide food supply, velocity refuge, cover, and cooler water temperatures with cover and ground water influence. They can easily be measured at various flows to determine if water augmentation projects are beneficial to the rearing habitat. WUA curves can give indirect habitat area with OCHs, but a field review and numerous flow measurements will indicate OCHs and how much water is needed for inundation. Fish presence and abundance can be measured within the OCHs to show increased populations at various flows.

Species Diversity and Abundance (OBJ-6)

Increased instream flow can increase population responses to diversity and abundance. Fish diversity and abundance can be sample using various techniques such as screw trap evaluation and enumeration,

Improve available habitat (OBJ-3)

Measured using flow-habitat modeling (PHABSIM, RHABSIM, Wetted Width, Toe-Width, etc) to create Weighted Usable Area (WUA) habitat curves for various fish species and life-histories. Models use habitat suitability curves for the species and life stages of concern. Measurements of habitat (depth, velocities, substrate, and cover) for various meso-habitats (riffle, run, pool, etc) are measured at a range of flows in a particular location. The data is used to develop a relationship between flow and available habitat for each species and life history stage. There are concerns about the applicability of these models to juvenile habitat due to the tendency of the models to produce relationships where low flows provide the best habitat for juveniles (probably due to velocity suitability). The models are not good at measuring micro-habitat (low velocities behind boulders, side channel habitat, etc) that may be suitable to juveniles during higher flow periods.

electrofishing, and seine net sampling via two pass regressions, or snorkeling. One to two control streams are needed as control streams to eliminate the variability in other environmental and bio-physical changes. Therefore, this type of sampling requires extensive time and effort.

C. Lessons Learned & Adaptive Management

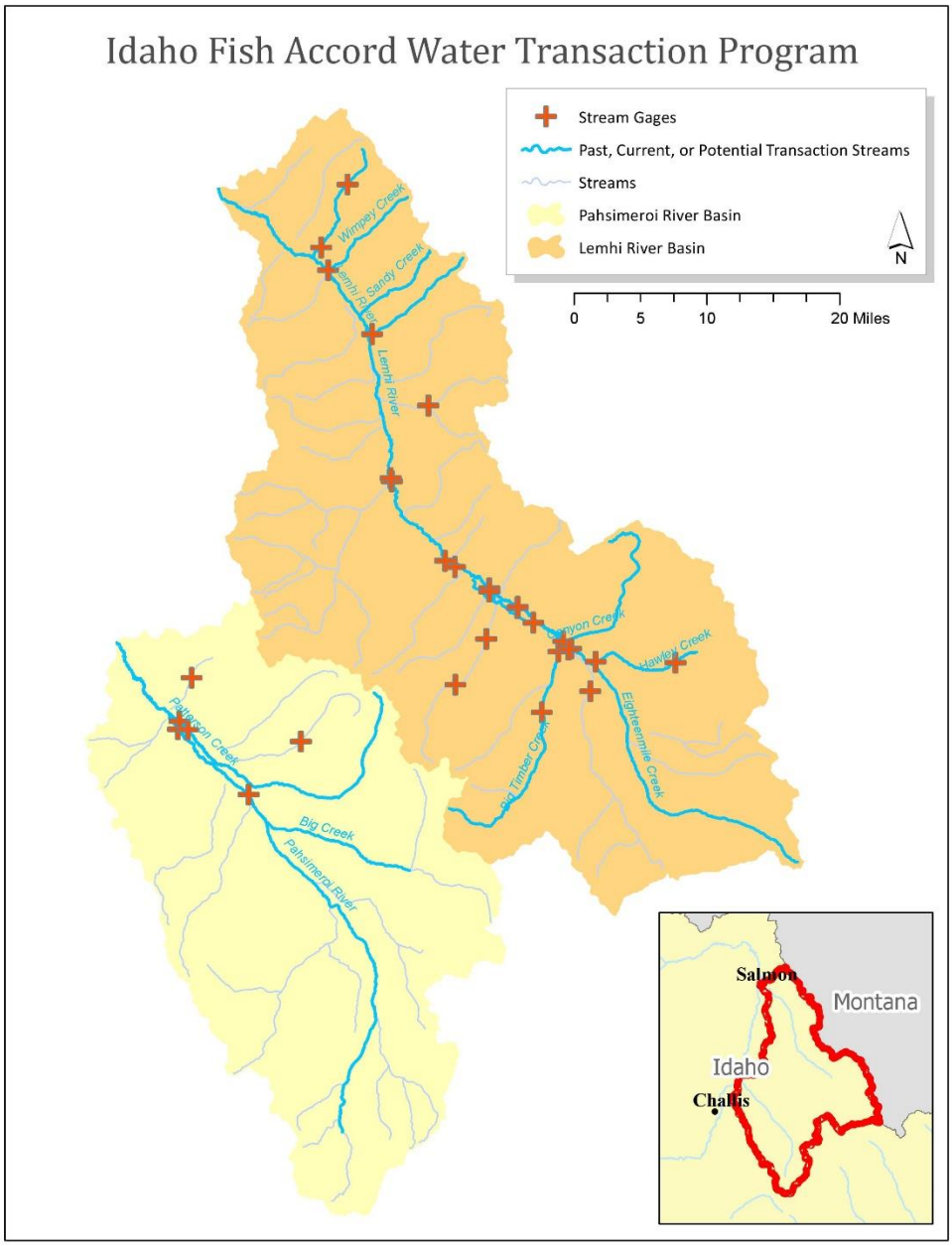
Problems Encountered: Work Element K: 164-102c08 is on hold due to the landowner not being able to find a replacement ranch. Transactions are dependent upon willing participants, so they can be derailed by external factors. In the future, transactions will not be added to the SOW until they are near completion.

Some transaction potential is limited by the tools available. With only one unmet minimum stream flow right in the Upper Salmon Basin (Lemhi River), use of the water supply bank to use irrigation rights to fulfill instream rights is limited.

Lessons Learned: Community support is stronger for transactions when there is an ongoing dialogue. In late 2012, a meeting to discuss a recently completed transaction and the resulting administration took a turn for the worse when members of the ranching community expressed concerns about restoration efforts in the basin. While the concerns were not necessarily relevant to the specific transaction, the discussion about the transaction elicited many opinions and concerns. To address this issue, IWRB staff has initiated more formal discussion between the ranching community and the restoration community. A public meeting was held in the fall of 2014 with presentations about water transactions, water administration, and other restoration activities. Planning is in the works for another fall social to continue the discussion about the reasons for restoration and the various approaches for that restoration and to get feedback.

Long-term Planning: The Idaho Water Resource Board continues to work with partners in the Lemhi and Pahsimeroi River basins to develop flow restoration projects that compliment other restoration activity intended to address factors limiting the production and survival of ESA-listed Chinook salmon, steelhead, and bull trout as well as other resident fish species. Participation in monthly Upper Salmon Basin Watershed Program technical team meetings ensures a high level of project review and coordination. Transactions to be implemented are focused on tributaries and reaches identified in planning documents (Salmon Subbasin Plan, Lemhi Framework, Upper Salmon Basin Screening and Habitat Improvement Prioritization in the Upper Salmon Subbasin, etc.) IWRB staff has also drafted a strategic plan for the Upper Salmon Basin which lays out the goals of the program and the prioritization of project identification and development.

Efforts in the Lemhi River basin will focus on reconnecting tributaries to the mainstem Lemhi River and improving flows in the Upper Lemhi River. Efforts in the Pahsimeroi will focus on improving flows in the few tributaries that have intrinsic rearing and spawning habitat below Hooper Lane.



Idaho Fish Accord active water transactions as of May 2015.