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Screening and Habitat Improvement Prioritization for the Upper Salmon Subbasin

(SHIPUSS)

Prepared for the

Upper Salmon Basin Watershed Project

and

Custer and Lemhi Soil and Water Conservation Districts

by the

Upper Salmon Basin Watershed Project Technical Team

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LIST OF ACRONYMS AND AGENCY RESPONSIBILITIES

BLM **Bureau of Land Management**. The BLM sustains the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations. The BLM manages a large portion of the land in the Upper Salmon River Basin.

BPA **Bonneville Power Administration**. The Bonneville Power Administration markets power generated by 31 federally owned dams, one nuclear plant and a large wind energy program to hundreds of utility customers. Among other responsibilities, the BPA funds projects to improve conditions for fish and wildlife in the Columbia River Basin.

CSWCD **Custer Soil and Water Conservation District**. Among other responsibilities, the CSWCD has partnered with the Upper Salmon Basin Watershed Project to assist local landowners with conservation on the ground. From riparian fencing and streambank restoration to improve fish habitat, to the installation of fish friendly structures and sprinkler irrigation systems to improve fish passage, the Custer SWCD has contracted with over 40 landowners since 1992. The CSWCD is the project manager and administers the funds for USBWP projects within its geographic area.

ESA **Endangered Species Act**

IDFG **Idaho Department of Fish and Game**. The Department of Fish and Game establishes regulations and other needed controls on fishing, hunting, trapping and management of nongame wildlife that are in line with the state's wildlife policy. Other management responsibilities include assisting the development and implementation of conservation measures in the Upper Salmon basin. The IDFG also operates an Anadromous Fish Screen Shop in Salmon, Idaho that installs and maintains screens on irrigation ditches to protect anadromous fish.

IDWR **Idaho Department of Water Resources**. Ensures Idaho's water and energy natural resources are properly managed and conserved to sustain the quality of life for Idahoans today and in the future. The IDWR administers water rights decreed by a court or developed through an administrative process, which allocate a quantity of water to irrigators.

LSWCD **Lemhi Soil and Water Conservation District.** Develops local natural resource conservation programs with established goals and objectives. In addition to its primary tasks, the LSWCD has partnered with the USBWP to accomplish numerous conservation projects, and administers the funds for USBWP projects within its geographic area.

MOU **Memorandum of Understanding**

NEPA **National Environmental Policy Act**

NMFS **National Marine Fisheries Service**. NMFS is dedicated to protecting and preserving our nation's living marine resources through scientific research, fisheries management, enforcement, and habitat conservation. In the Upper Salmon River Basin, NMFS is responsible for the protection of anadromous chinook salmon, sockeye salmon, and steelhead.

NRCS **Natural Resources Conservation Service**. The Natural Resources Conservation Service provides leadership in a partnership effort to help people conserve, maintain, and improve our natural resources and environment. In the Upper Salmon River Basin, the NRCS assists landowners by providing technical assistance in the design of on-farm improvements such as sprinkler systems.

OSC **Idaho Office of Species Conservation**. The OSC coordinates ESA programs with state agencies; solicits, provides, and delegates funding for ESA programs; creates de-listing advisory teams; serves as the state's "one voice" on ESA policy; provides a mechanism for Idaho citizens to voice ESA concerns; and facilitates collaboration between State, Federal, and private stakeholders.

RECLAMATION

Bureau of Reclamation. Reclamation's mission is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public. In the Lemhi and Upper Salmon River Basins, Reclamation provides technical assistance on projects that enhance instream flow, improve fish passage, and prevent entrainment in irrigation systems.

SALMON RIVER COALITION

The Salmon River Coalition was organized for the defense of private property rights and to raise funds for legal defense against environmental suits. The Salmon River Coalition also works with private property owners, federal, and state agencies to develop plans to bring private property owners into compliance with local, state, and federal environmental laws.

SHIPUSS	**Screening and Habitat Improvement Prioritization for the Upper Salmon Subbasin**
USBWP	**Upper Salmon Basin Watershed Project**. The USBWP strives to protect, enhance, and restore anadromous and resident fish habitat and achieve and maintain a balance between resource protection and resource use on a holistic watershed basis.
USFS	**United States Forest Service**. The USFS sustains the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations. The USFS manages a large portion of the land in the Upper Salmon River Basin.
USFWS	**U.S. Fish and Wildlife Service**. The USFWS' mission is to work with others to conserve, protect, and enhance fish, wildlife, and plants, and their habitats for continuing benefit of the American people. In the Upper Salmon River Basin, the USFWS is responsible for the protection of bull trout, which are included in SHIPUSS, and several wildlife species which are not included.
USRB	**Upper Salmon River Basin**

INTRODUCTION AND PURPOSE

Background

The Upper Salmon River Basin (USRB) in central Idaho contains unique public lands, fish, wildlife, plants, scenic and cultural resources that are important to the nation. Threatened and endangered species listed under the Endangered Species Act (ESA) are of particular importance to the American people because they indicate a fragile ecosystem, and conservation needs of ESA-listed fish species are receiving increasing attention.

Native anadromous and resident fish species, including those listed under the ESA, may be affected by irrigation water diversions, livestock grazing, and associated agricultural activities. Fish species may be affected in several ways, including disconnection of tributaries from larger streams and rivers, insufficient flows at key periods to allow passage, increased water temperatures, smothering of eggs due to excessive sedimentation, and loss of vegetation along streambanks. Water users and landowners in the Upper salmon River Basin (USRB) are interested in ensuring their land and water management actions may continue in a manner that is consistent with the purposes of the ESA for protection and recovery of listed fish species.

Purpose

The Screening and Habitat Improvement Prioritization for the Upper Salmon Subbasin (SHIPUSS) is intended to address fish conservation needs on or adjacent to irrigated agricultural and livestock ranching lands. Therefore, conservation activities are targeted primarily towards privately owned lands, although irrigation diversions and other activities on public lands are also considered. Conservation needs may include, but are not limited to, assessment of flow adequacy for fish migration and life histories, screening of ditches, assessment of entrainment risk, consolidation or improvement of diversions, habitat improvement, evaluation of irrigation efficiency, and evaluation of barriers. SHIPUSS is a prioritized list of streams within watersheds (defined under "Geographic Area") to guide fish screening and habitat improvement efforts on privately owned lands throughout the USRB. SHIPUSS was developed by the Upper Salmon Basin Watershed Project (USBWP) Technical Team (Tech Team), which is comprised of professional technical experts and fisheries biologists from regional state, federal, and tribal agencies, and other groups (Appendix A). SHIPUSS was developed to assist the Tech Team and USBWP Advisory Board in prioritizing the funding of conservation efforts across the USRB, and is intended to be used by these groups in conjunction with existing project-level prioritization methods.

A prioritization process such as SHIPUSS is necessary because the current demand for conservation funding assistance to landowners is much greater than the available resources. An overwhelming number of USRB water users have approached local agencies (primarily the Idaho Department of Fish and Game (IDFG) Screen Shop, Natural Resources Conservation Service (NRCS), USBWP, Bureau of Reclamation

(Reclamation), and the Lemhi and Custer Soil and Water Conservation Districts) requesting assistance in screening of irrigation ditches or implementing of fisheries conservation or restoration measures on their property. The ability of these organizations to help the landowners has been limited by the lack of available personnel, the lack of a central representative for the irrigators, the inability to guarantee that conserved or purchased water will remain in the channel to benefit fish, and most importantly, the lack of sufficient funding to meet the demand for on-the-ground habitat improvement and mitigation projects.

Goal

The primary goal of SHIPUSS is to create a prioritized list of streams within watersheds to guide screening and habitat improvement projects on privately owned lands in the USRB. This will be used by the USBWP and other interested parties in conjunction with project level prioritization to accomplish screening and habitat objectives.

SHIPUSS will also serve as a habitat restoration prioritization template into which a variety of data types can be incorporated. Only by being continually updated will SHIPUSS be useful for a variety of entities and for a long period of time.

Integration with other recovery efforts

Upper Salmon Basin Watershed Project

The Idaho Model Watershed Plan (1995) (http://www.efw.bpa.gov/Environment/EW/EWP/DOCS/REPORTS/OTHER/Z2772.pdf) is the USBWP's guiding document intended to identify actions that are needed for salmon habitat and to establish a procedure to implement habitat improvement measures. It identified five factors that are limiting salmon production within the USRB. These are: 1) inadequate water flows; 2) high water temperatures; 3) lack of streamside vegetation; 4) high sediment levels; and 5) physical barriers (including lack of screens on ditches). Once these limiting factors were identified, associated objectives for improvement were identified. The objectives identified in the Plan were to: 1) Increase instream flows during critical fish migration periods; 2) Reduce the number of physical barriers hindering fish migrations; 3) Develop new rearing and resting pools; 4) Establish riparian vegetation along critical areas to provide cover and reduce temperatures; and 5) Reduce the sediment levels within spawning gravels.

From its creation in 1992 to 2001, the USBWP has focused on developing and implementing conservation measures in the Lemhi, Pahsimeroi, and East Fork Salmon River drainages. Funding has been provided primarily through the Bonneville Power Administration (BPA). In 2001, the USBWP's geographic area was expanded to include the entire Upper Salmon River Subbasin above the Middle Fork Salmon River. At the same time, more interest in conservation was expressed by area landowners, while less BPA funds became available. A method to prioritize projects and streams was therefore

necessary. The IDFG Screen Shop (Screen Shop) began to develop a prioritization method to guide screening efforts in tributary streams during the winter of 2001-2002. This method used existing stream survey data from snorkel surveys and redd counts to determine fish densities in the tributaries. However, a more comprehensive approach was needed to address other habitat problems present in the USRB. The methodology and results of the Screen Shop prioritization scheme were used as a foundation for the initial development of SHIPUSS, which examines USRB problems in a more comprehensive manner.

Habitat Conservation Plans

SHIPUSS is a timely tool that integrates with conservation efforts in the USRB. A formal agreement specific to the Lemhi River is currently being developed under the ESA. The Idaho Office of Species Conservation (OSC), Idaho Department of Water Resources (IDWR), IDFG, State of Idaho Office of Attorney General, USBWP, Lemhi Irrigation District, Water Districts 74, 74Q, 74W, and 74Z, National Marine Fisheries Service (NMFS), and the US Fish and Wildlife Service (USFWS) are currently working to develop a long-term habitat conservation plan under §6 of the ESA which will provide area ranchers with incidental take coverage (i.e., authorization for a level of harm to listed fish) for irrigation-related activities. In return, the ranchers will agree to provide enhanced instream flows, identify and implement projects to restore connectivity, and pursue other habitat improvement measures. The Lemhi Agreement will incorporate some type of project prioritization scheme that may be influenced by SHIPUSS or may be a modified version of SHIPUSS that meets the needs of Lemhi water users.

U.S. Fish and Wildlife Service Bull Trout Recovery Plan

The USFWS released a draft recovery plan for bull trout in October 2002. The Salmon River Recovery Unit includes the entire Salmon River drainage, approximately half of which is above the confluence with the Middle Fork Salmon River. Therefore, much of this Recovery Unit falls within the geographic area considered by SHIPUSS. In the Salmon River Recovery Unit, many strong local populations of bull trout exist; however, the most significant limiting factor identified for bull trout is the lack of connected tributary habitat. This prevents bull trout from expressing the fluvial life history strategy (spawning in tributaries but migrating to larger rivers to over-winter). One of the implicit objectives of SHIPUSS is to connect tributaries to mainstem habitat wherever possible, so the intent of both documents is complementary.

The USFWS has solicited the professional opinion of the biologists working in the Upper Salmon area, and is also aware of the development of SHIPUSS. Since SHIPUSS uses a multi-species approach to prioritization, the priorities identified in SHIPUSS are not necessarily the same as the areas that would be identified as priorities for bull trout. However, the USFWS will use the factors evaluated in SHIPUSS to prioritize stream reconnections for bull trout. To that end, the USFWS intends to identify high priority

tasks in the Recovery Plan for reconnecting Priority I and Priority II streams identified by SHIPUSS.

Subbasin Planning

In 1980, the Pacific Northwest Electric Power Planning and Conservation Act (Northwest Power Act) directed the agencies responsible for managing hydropower projects on the Columbia River system to "protect, mitigate, and enhance fish and wildlife, including related spawning grounds and habitat, affected by such projects . . . in a manner that provides equitable treatment for such fish and wildlife" (Northwest Power Act 16 U.S.C. §839b(h)(11)(A)(i)). The Northwest Power Act also created the Northwest Power and Conservation Council (Council), formerly the Northwest Power Planning Council, made up of representatives from Idaho, Washington, Oregon, and Montana. As part of the Fish and Wildlife program, every year the Council reviews proposals for projects and research to implement the program. Proposals meeting the highest standards are then recommended to Bonneville Power Administration (BPA) for funding. The Council's 2000 Columbia Basin Fish and Wildlife Program marked the start of a new review and selection process, which requires the development of local subbasin plans to guide project funding. The intent of these plans is to provide a blueprint to recovery efforts in each subbasin. Until recently, virtually all of the USBWP's funding came from the BPA.

For the subbasin planning effort, a total of 62 subbasins were identified; the area covered by SHIPUSS is included in the upper half of the Salmon River subbasin. In December 2002, the Shoshone-Bannock Tribes were selected as the lead entity for the upper Salmon River, while the Nez Perce Tribe was selected as the lead entity for the lower Salmon River portion of the plan. The Shoshone-Bannock Tribes subcontracted with the USBWP for outreach activities. IDFG was the lead for assessments in both areas.

The subbasin plan identifies goals for fish, wildlife, and habitat; defines objectives that measure progress toward those goals; establishes strategies to meet those objectives; and incorporates much of the existing information into a single document. The three main parts of the plan are the inventory, assessment, and management plan. The inventory includes information on fish and wildlife protection, restoration, and artificial production and management plans within the subbasin. The assessment consists of a technical analysis to determine the biological potential of each subbasin and restoration opportunities. It describes existing and historic resources, conditions, and characteristics. Finally, the management plan includes a vision for the subbasin, biological objectives, and strategies. It is based on a 10-15 year planning horizon.

These subbasin plans were developed throughout the Columbia Basin by local fish and wildlife managers, tribes, government agencies, and citizens. The subbasin plans also involve a broad range of constituents and are linked to ongoing and previous restoration efforts. The final version of the Salmon Subbasin plan, assessment, and inventory are available at http://www.nwcouncil.org/fw/subbasinplanning/salmon/plan/

SHIPUSS was used in the development of the subbasin assessment and plan, and was revised and supplemented during the subbasin planning process. In this manner, SHIPUSS has contributed to BPA-funded restoration efforts. SHIPUSS may also be a useful tool to guide non-BPA funded restoration activities, which will likely account for a larger portion of the projects in the area in the future.

Limitations

Although SHIPUSS is a very useful tool, it has several limitations that must be acknowledged. First, SHIPUSS is based on available survey information, most of which was collected over the last several decades after major population declines had already occurred. Therefore, the priorities may favor areas that currently have higher densities of fish, while underestimating the potential of areas where populations are low but historically had high densities. However, the current status is important, so the region has decided to commit resources to "protect the best, then restore the rest." Based on this philosophy, SHIPUSS is a very good approach for identifying the best areas to target resources. BPA has also selected this approach to prioritize project funding.

Second, because SHIPUSS is based on currently available survey information, and many streams and stream reaches have not been adequately surveyed, some streams with strong fish populations may not be identified as priority areas. For example, many streams originate on Forest Service managed land, pass through land managed by the Bureau of Land Management, then join with a mainstem on private land. Except on the Lemhi, East Fork, and Pahsimeroi, very few surveys of any kind have been conducted on streams or reaches passing through private land.

Third, data from stream flow studies and stream gauges were not included because the data are not comprehensive enough to be useful. A number of instream flow studies have been conducted in the Upper Salmon River drainage but few have been conducted in small streams. Likewise, instream flow data are available from a number of sources but continuous records on most of the tributary streams are lacking. Due to lack of data the current version of SHIPUSS does not address adequacy of instream flows for the target species. SHIPUSS does, however, acknowledge the importance of improving stream flows in tributaries and mainstem reaches. Instream flow studies are currently being expanded in the USRB and the resulting data can be incorporated into SHIPUSS as they become available.

Fourth, scoring of the non-fisheries categories is mostly subjective. For example flow velocity, and depth data are not available for most of the stream reaches and the adequacy of flows for fish passage was not considered, so a subjective approach was taken to determine connectivity, except where streams are completely dry. Habitat quality scores were also determined subjectively based on the judgment of field biologists who must consider the general stream characteristics (substrate, gradient, morphology, etc.),

limiting factors (temperature, sediment, barriers, flows, etc.) and the potential for restoration activities to affect the limiting factors. For example, fencing a stream that is heavily impacted by sediment will have much less of an effect if that stream is spring-fed than if it is fed by run-off, since a spring-fed stream may not receive the flushing flows needed to clear the gravels of accumulated sediments.

Fifth, specific methods are not explained in detail. The urgent need for a useful prioritization process and the dynamic nature of SHIPUSS development has made a detailed description of methods impractical for the current version. The authors of SHIPUSS are involved in most restoration planning efforts in the Upper Salmon River drainage, so as SHIPUSS adapts and evolves to incorporate new data and meet changing circumstances, description of methods can be revised and updated as needed. Refer to Appendix E for a list of persons to contact for additional information on SHIPUSS.

Finally, scores in SHIPUSS cannot be compared across watersheds because each watershed has unique biologic, geologic, ecologic, social, and other characteristics. Because of this, it is impossible to effectively compare one watershed to another without some knowledge of the area. For example, Morgan Creek and Pole Creek, tributaries of the Salmon River, and Sheep Creek, tributary to the North Fork Salmon River, could possibly receive identical scores. These streams are all in different vegetation and climate zones and have different limiting factors and expected responses, so they cannot be compared based solely on the scores. Additional tools or prioritization processes would need to be developed if a comparison was needed.

GEOGRAPHIC AREA

The area covered by SHIPUSS includes all mainstem and tributary habitats of the Salmon River, from the mouth of the Middle Fork Salmon River upstream to the headwaters of the Salmon River near Galena Summit. The area is divided into 11 distinct drainage areas; five large river subbasins, and six mainstem river reaches of the Salmon River with associated tributaries. The 11 distinct drainage areas of the USRB were selected to ensure that known local populations of anadromous and resident fish would be addressed and provided adequate consideration for mitigation efforts. The five large river subbasins include: 1) North Fork Salmon River; 2) Lemhi River; 3) Pahsimeroi River; 4) East Fork Salmon River; and 5) Yankee Fork Salmon River. The six mainstem Salmon River reaches include: 1) Middle Fork Salmon River to North Fork Salmon River; 2) North Fork Salmon River to Pahsimeroi River; 3) Pahsimeroi River to East Fork Salmon River; 4) East Fork Salmon River to Yankee Fork of Salmon River; 5) Yankee Fork of Salmon River to Valley Creek, including Valley Creek; and 6) Valley Creek to Headwaters of Salmon River. These drainage areas will be referred to as watersheds throughout this document, although many actually include several watersheds.

FISH SPECIES INCLUDED

Five fish species were considered in the development of SHIPUSS; three species are listed as threatened under the ESA, and two are not. They include:

- Snake River spring/summer chinook salmon (threatened)
- Snake River steelhead (threatened)
- Bull trout (threatened)
- Westslope cutthroat trout
- Resident rainbow/redband trout

Snake River sockeye salmon, which are listed as endangered under the ESA because of critically low population levels, were not specifically considered during the development of SHIPUSS for two reasons. First, SHIPUSS is intended to prioritize fish conservation efforts for USBWP, the Soil and Water Conservation Districts, and other entities working with private landowners and all sockeye salmon spawning and rearing habitat exists in areas not affected by actions on private lands. Second, although reduced flows in the main Salmon River likely affect both juvenile and adult survival during migration, adequacy of instream flow was not addressed by this version of SHIPUSS. Projects resulting in flow improvements in the Salmon River would benefit sockeye salmon as well as the target species; however since adequacy of flow is not a category that was considered, inclusion of sockeye salmon would have no effect on overall scores. Another reason sockeye were not specifically considered is that the data used as a foundation for SHIPUSS were collected in tributary streams where sockeye do not occur, or in the mainstem Salmon River using methods that do not effectively sample migrating sockeye salmon.

Two other historically anadromous species that were not considered during the development of SHIPUSS but should be mentioned are the white sturgeon and the Pacific lamprey. Very little is known about the Salmon River populations of these species. Sturgeon historically have been documented at least as far upstream as the town of Challis, Idaho, and possibly as far up as Clayton, Idaho based on reports from river outfitters in the 1990s. The Idaho Department of Fish and Game will be conducting a lamprey study in the Salmon River system in the future to more accurately describe the distribution of lamprey.

METHODS AND DESCRIPTION OF CATEGORIES

To begin the ranking process, the USBWP Tech Team SHIPUSS committee first started with the list of streams identified as priority streams by the Screen Shop's early prioritization. The Tech Team then identified which additional criteria would be considered. Criteria were broken into four general categories: Stream Connectivity and Size; Habitat; Fisheries; and Non-Biological Factors. A summarization of the criteria and ratings is included in Table 1, and described in detail below.

All criteria were scored as High, Medium, or Low, and were phrased in such way that High was most desirable in all cases. High scores were given two points, Medium scores were given one point, and Low scores were not given any points. Based on this method, the highest overall score was considered the highest priority stream. Since it is possible for streams or reaches to receive a "Not Applicable" rating in several criteria, the final score was then divided by the total possible score for that stream to derive an Adjusted Percent Total.

After each stream was scored, streams were broken into Priorities based on their Adjusted Percent Total. Priority I streams are those receiving 70% of the possible points and Priority II streams are those receiving at least 50% of possible points. Priority III streams or reaches are those receiving less than 50% of possible points. These priority levels were based on what appeared to be natural break points during the early process.

Priority I streams are those that have the potential to realize immediate, tangible benefits to fish if recovery efforts are directed toward them. Priority II streams are those that will also have tangible benefits, but they may be less substantial or may be delayed for quite some time. There may be other factors limiting the potential of these tributaries, such as chemical contamination from mines and uncooperative landowners. Priority III streams are low priority streams because they have very limited production potential, or will require extremely high levels of effort to restore their productivity.

Appendix B lists streams that will be surveyed in the future for inclusion in SHIPUSS. Currently, little or no fish survey information exists for these streams, or the information was not readily available at the time of development. All of these streams may have the potential to provide suitable habitat for the five species considered during the development of SHIPUSS. Numerous other USRB streams that will not be considered for SHIPUSS are listed in Appendix C. These streams are not currently being considered for prioritization because they either are insignificant fish producers, or they have no problems that are targeted by the SHIPUSS prioritization. If future information suggests that any of these streams should be included, they will be reviewed at that time. Only perennial streams are included in Appendices B and C. Appendix D lists streams that have been prioritized, but removed from Tables 1 and 2. These streams have been removed from prioritization either because all conservation activities have been completed, or no projects remain that fall within the scope of SHIPUSS. Streams that receive a total score of at least 95% are listed in Appendix D. These streams will be monitored and may be returned to the prioritization if conditions warrant it.

RANKING CATEGORIES

1) Stream Connectivity and Size

Criteria under this category consider current and potential connectivity of a tributary (or mainstem reach) to the mainstem. Habitat connectivity between stream reaches can be impaired for a variety of reasons; however, this section only concerns connectivity

impairment due to irrigation diversions. Other types of barriers are addressed in the Habitat section. Except in cases where streams are completely dry or barriers are absolute, the degree of connectivity is very difficult to quantify. Many stream reaches in the Upper Salmon River drainage are completely dry for part or all of the year, causing them to be disconnected from other fluvial habitats. Many other reaches, however, have surface flow connections that are degraded by irrigation diversions or other habitat perturbations. For SHIPUSS, connectivity was defined simply as the presence of water in a given reach. No attempt was made to determine the adequacy of flow and temperature for upstream or downstream movement of fish. Information on flow,depth, and temperature will be incorporated into SHIPUSS as more data become available.

Tributaries or mainstem reaches that have year-round surface water connections received a High rating. A Medium rating is given for tributaries or reaches connected at least nine months, and a Low rating is given for tributaries connected less than nine months. A High rating does not necessarily indicate that flows are sufficient for unimpaired fish passage; additional local knowledge is needed to make that determination.

The size of the stream is only considered relative to other streams within the same watershed, not across watersheds. This criterion was generally based on flow contribution, and not fish habitat. Therefore, a stream that currently or potentially contributes 5 cfs may receive a High rating in one watershed, while a comparable stream in a different watershed may receive a Medium score.

In the future, the Tech Team plans to include GIS mapping information showing the number of miles of available habitat in each stream, which will allow a more accurate comparison of watersheds.

2) Habitat

This category provides criteria based on current and potential habitat quality. High quality habitat has no major limiting factors and supports all expected life stages of species that occurred historically. Medium quality habitat may have minor problems that should not severely limit habitat potential. For example, two or more parameters (e.g. sediment and temperature) may be outside of recommended criteria for a portion of the stream, but problems can be remedied through restoration activities. Low quality habitat either (a) is degraded to the point of severe limitation, or b) only supports one life stage, such as migration, when multiple life stages are expected or have been historically documented.

Also under this category is a criterion that considers whether barriers besides diversions exist in the stream. These barriers may be natural, such as waterfalls that restrict fish access to large parts of the watershed, or man-made, such as culverts that do not allow fish passage. If a stream scores Medium or Low in this criterion because barriers are present, further explanation may be necessary.

3) Fisheries

This category lists the current and potential life history expression of anadromous fish (naturally produced Chinook salmon and steelhead), bull trout, and resident trout (rainbow and cutthroat). The list of streams included in this category was derived from IDFG stream surveys and was weighted towards ESA listed fishes. The purpose of this category is to identify current and potential life history expression of anadromous and resident fish. Current conditions are based on existing snorkel survey and redd count information, and potential condition is based on current information and professional judgment. Areas with a High rating support all expected life stages, based on morphology, gradient, substrate, and other habitat variables. A High rating in both the current and potential columns does not mean that the stream is maximizing its fishery capacity, but rather that all expected life stages or histories are currently being expressed. In many cases, additional habitat restoration is necessary for the local population to realize its full potential. An area with a Medium rating may support all life stages, but restoration success is not expected to be very high. An area with a Low rating is generally only used as a migration corridor, if at all.

4) Non-Biological Factors

Virtually all fisheries restoration and recovery activities in the USRB must be conducted cooperatively with private landowners. This final category contains six criteria that address different components of landowner interaction. The expected cost-benefit ratio of "fixing" a stream is very difficult to determine, and has many variables. It must consider, among other variables, the value of the stream to the resource, how degraded it is, how many landowners are involved, how many types of projects will be involved, and the geology of the system. However, several key tributaries and reaches are crucial to salmonid recovery and population integrity, and this category attempts to attach a value to these streams. The Tech Team recognizes that its expertise lies in the realm of science, not economics, but also believes that it is qualified to conduct cursory cost-benefit analyses based on the expected biological benefit returned to the system. This category is not intended to attach real dollars to a stream, but to get a "feel" for whether the effort required to realize benefits is "worth it." For example, some systems would benefit greatly from a simple project such as a fence, while other systems may only realize minimal benefits through extensive restoration efforts. By including this rough cost-benefit estimate, the Tech Team hopes to reduce the diversion of limited amounts of money to non-productive projects, and document the Tech Team's biological opinion. A High rating would be given to an area where high benefits at relatively low costs could be expected. An area with a high benefit, high cost, or moderate benefits at medium to high costs would receive a Medium rating, and an area with low benefits would receive a Low rating, regardless of cost.

Landowner interest and willingness was determined based on who has contacted the USBWP or IDFG Screen Shop regarding potential projects, and on knowledge of the people living in the area. Obviously, this criterion is prone to change, since it assesses the personal opinions of hundreds of landowners. Over time, landowners who are not currently interested in participating in conservation efforts may change their minds and wish to be included. Therefore, this category only reflects the current state of landowner willingness, and will be revised in the future. This section also addresses stream flows and diversions, and therefore may receive a Not Applicable (NA) rating on the table if no opportunities to improve these criteria exist.

Two criteria in this category address the potential to increase flows in a stream through either leases/acquisitions or through irrigation/management improvements. A High potential indicates that there are many willing landowners along the tributary, and that there is a high potential to return water to the stream. A Medium potential indicates that water returns may be limited or seasonal, or that there are few interested landowners. Low potential indicates low potential to return water to the stream due to lack of landowner interest or physical impracticalities. Not Applicable indicates that flows are not a limiting factor in that stream or reach.

Another criterion in this category addresses the simplicity of resolving diversion issues. A High score means that solving the problems in this drainage will be relatively simple and straightforward. For example, few landowners may be involved or the resolution may be simple. A Medium score means that solutions will be more difficult due to system complexity and the number of landowners involved. A Low score indicates that it will be very difficult to coordinate and design solutions to diversion issues in that system. Not Applicable means that diversions are not an issue in this stream or reach.

Two related criteria consider the potential to consolidate diversions in a stream and the simplicity of resolving screening issues. These criteria refer in part to the feasibility of consolidations and screening, with a High score correlated to a relatively easy “fix” to improving fish migration.

CONCLUSION

SHIPUSS will prove to be a valuable component for salmonid recovery in the USRB. It will also be an important resource to the USBWP for implementation of the Model Watershed Plan, and for the Lemhi and Custer Soil and Water Conservation Districts as they work with area landowners to accomplish screening, conservation, and restoration projects in the USRB.

Actual selection of prioritized streams may depend on external factors, such as constraints on funding, landowner willingness, lawsuits, availability of matching funds, or project readiness in light of environmental compliance (NEPA, ESA consultation, permits, etc.). Because of this variety of external factors that can affect the priority of a

project, the Tech Team recommends that SHIPUSS be used by the USBWP or other people familiar with the USRB. The staff will be best equipped to deal with the external factors identified above, identify realistic goals, coordinate with the landowners, design projects, and determine when the stream or reach is "restored."

SHIPUSS will also be a valuable resource for other planning activities in the USRB, such as the bull trout recovery plan, the Lemhi Agreement, and subbasin planning. Although, due to lack of available data, the current version of SHIPUSS is largely based on subjective criteria it can and will be amended on a regular basis as more data becomes available. SHIPUSS is envisioned as a "living" document that can evolve to meet the needs of a variety of users.

One of the most valuable features of SHIPUSS, beyond its adaptability as more data becomes available, is the format. By using the spreadsheet design, the user can easily look at a stream and identify areas that need attention. For example, a user can look at the criterion "Simplicity of resolving screening issues" and see that screens are not an issue in one tributary, but they are in another. The user can also look at the criterion "Stream connectivity to mainstem (current)" and tell whether connectivity is an issue in that tributary. While the spreadsheet cannot give a complete picture of each tributary, it can tell the user that a stream is of high, medium, or low priority for conservation efforts. This ability of SHIPUSS to give a concise overview of stream condition and compare conditions within a watershed will prove to be invaluable in the future.

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Table 1. Summarization of the ranking categories and scoring criteria.

	Stream Connectivity and Size			Habitat			Fisheries						Non-Biological Factors					
	Stream Connectivity to mainstem (current)	Stream connectivity to mainstem (potential)	Size of tributary stream	Habitat quality (existing)	Habitat Quality (potential)	Lack of other barriers besides diversions	Naturalized Anadromous Fish Life History Expression (Current)	Naturalized Anadromous Fish Life History Expression (Potential)	Bull Trout Life History Expression (current)	Bull Trout Life History Expression (Potential)	Resident Life History Expression (Current)	Resident Life History Expression (Potential)	Expected Cost:benefit	Potential to increase flows via leases or acquisitions	Potential to increase flows through irrigation or mgt improvements	Simplicity of resolving diversion issues	Potential for diversion consolidation	Simplicity of resolving screening issues
2	Year-round surface water connections		Significant water contributions to mainstem compared to other tributaries in the watershed	No major limiting factors and supports all expected life stages and species that occurred historically		Watershed does not contain any natural or man-made barriers (falls, culverts, etc.) other than irrigation diversions	Supports all expected life stages/histories and species						High benefit for species of concern compared to expected cost of conservation activities	Significant water conservation is expected if key landowners participate in a voluntary water transaction	Significant water conservation is expected if key landowners incorporate water saving measures	Few diversions, with willing landowners. Diversions are mostly single-user.	Opportunities to consolidate diversions exist	Few screens are needed, with willing irrigators
1	Connected at least nine months each year		Moderate water contributions to mainstem compared to other tributaries in the watershed	Has problems that are limiting life stages or species distribution, but problems can be easily remedied through conservation activities.		Watershed may have one natural or man-made barrier that needs to be replaced	May support all expected species, but certain life stages or histories are not being expressed						High benefit with high cost, or moderate benefits at medium to high costs	Moderate water conservation is expected, or non-key landowners are interested in water transactions	Moderate water conservation is expected through water saving measures	Many diversions with multiple users on each system	Opportunities to consolidate diversions exist, but there may be complex negotiations involved	Complex diversion systems; may have reluctant irrigators
0	Connected less than nine months each year		Insignificant water contributions to mainstem compared to other tributaries in the watershed	Habitat is severely degraded, or supports only one life stage when multiple life stages are expected or have been historically documented.		Watershed contains numerous man-made barriers other than irrigation diversions	Does not support all expected species						Low benefits, regardless of cost	Low potential for any water conservation through transactions	Low potential for any water conservation through water saving measures	Extremely complicated systems and/or unwilling landowners	Landowners are not interested in consolidations.	Extremely complicated systems and/or unwilling landowners
NA			This is a mainstem reach											Reach or tributary is not flow impaired	Reach or tributary is not flow impaired	All diversion issues have been addressed, or no diversions exist	All diversion issues have been addressed, or no diversions exist	All diversions have been screened to NMFS criteria, or no diversions exist

Table 2. Streams and reaches rated for biological factors only, using the SHIPUSS system. Priority I streams are those receiving at least 70% of possible points. Priority II streams are those receiving between 50% and 69% of available points, and Priority III streams are those receiving less than 50% of available points. Streams can only be compared within the same watershed, since unique biologic, geologic, ecologic, social, and other characteristics interact to preclude comparisons across watersheds. The adjusted percent total adjusts for the possibility that a stream may receive a Not Applicable (NA) rating in some categories. See Table 1 and narrative for a complete description of categories. 2 = High; 1 = Medium; 0 = Low.

	Stream Connectivity* and Size			Habitat			Fisheries								
	Stream connectivity to mainstem (current)	Stream Connectivity to mainstem (potential)	Size of tributary stream	Habitat Quality (existing)	Habitat Quality (potential)	Lack of other barriers besides diversions	Naturalized Anadromous Fish Life History Expression (current)	Naturalized Anadromous Fish Life History Expression (potential)	Bull Trout Life History Expression (current)	Bull Trout Life History Expression (potential)	Resident Life History Expression (current)	Resident Life History Expression (potential)	Total Score	Possible Score	Adjusted Percent Total
Salmon (MF-NF)															
Squaw	2	2	1	2	2	2	2	2	2	2	1	2	22	24	92
Spring	2	2	1	2	2	2	2	2	1	2	2	2	22	24	92
Boulder	2	2	1	2	2	1	2	2	2	2	2	2	22	24	92
Indian	2	2	1	2	2	2	1	2	2	2	1	2	21	24	88
Upper Panther (above Blackbird, including mainstem and tributaries)	2	2	2	1	2	1	1	2	1	2	2	2	20	24	83
Owl	2	2	2	2	2	2	2	2	1	1	1	2	21	24	83
Pine	2	2	1	2	2	2	1	2	1	2	1	2	20	24	83
Moose	2	2	1	2	2	2	2	2	0	1	2	2	20	24	83
Lower Panther (below Blackbird, including mainstem and tributaries)	2	2	NA	1	2	2	1	2	1	2	1	2	18	22	82
Colson	2	2	1	2	2	1	2	2	0	1	2	2	19	24	79
Lake	2	2	1	1	2	1	1	2	0	1	1	1	15	24	63
East Boulder	2	2	0	1	1	1	1	1	0	0	1	1	11	24	46
Dump	2	2	0	0	1	2	1	2	0	0	0	1	11	24	46
Sage	2	2	0	1	1	1	0	0	0	0	1	2	10	24	42
Salmon(NF-Pah)															
Carmen	1	2	2	1	2	2	1	2	2	2	1	2	20	24	83
4th of July	1	2	2	1	2	2	1	2	2	2	1	2	20	24	83
Hat	2	2	2	1	2	1	1	2	2	2	1	1	19	24	79
Iron	1	2	2	1	2	1	1	2	2	2	1	1	19	24	79
Twelvemile Creek	1	2	1	2	2	0	1	2	1	2	1	2	17	24	71

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	Stream Connectivity* and Size			Habitat			Fisheries								
	Stream connectivity to mainstem (current)	Stream Connectivity to mainstem (potential)	Size of tributary stream	Habitat Quality (existing)	Habitat Quality (potential)	Lack of other barriers besides diversions	Naturalized Anadromous Fish Life History Expression (current)	Naturalized Anadromous Fish Life History Expression (potential)	Bull Trout Life History Expression (current)	Bull Trout Life History Expression (potential)	Resident Life History Expression (current)	Resident Life History Expression (potential)	Total Score	Possible Score	Adjusted Percent Total
Tower	1	2	1	1	2	1	1	2	1	2	1	2	17	24	71
Mainstem Salmon River - North Fork to Pahsimeroi	2	2	NA	1	1	2	1	1	1	1	1	1	14	22	64
Wagonhammer	2	2	1	2	2	1	0	0	0	0	2	2	14	24	58
Williams	1	2	1	1	2	0	1	2	0	0	1	2	13	24	54
Lake	0	1	1	1	2	0	0	2	1	2	1	2	13	24	54
Wallace Creek	1	2	0	1	2	1	1	1	0	0	1	1	11	24	46
Salmon(Pah-EF)															
Morgan	2	2	2	1	2	1	1	2	1	2	2	2	20	24	83
Challis	1	2	2	1	2	1	1	2	1	2	2	2	19	24	79
Mainstem Salmon River - Pahsimeroi to East Fork (12 Mile)	2	2	NA	1	2	2	1	2	1	1	1	2	17	22	77
Garden	1	2	1	1	2	1	1	2	1	2	1	2	17	24	71
Mainstem Salmon River - Pahsimeroi - East Fork (exc. 12 Mile)	2	2	NA	1	2	2	1	1	1	1	1	1	15	22	68
Bayhorse Creek	1	2	1	1	2	1	1	2	0	0	1	2	14	24	58
Salmon (EF-YF)															
Mainstem Salmon River-East Fork to Headwaters	2	2	NA	1	2	2	2	2	1	2	1	2	19	22	86
Slate	2	2	2	1	2	2	1	2	1	2	1	2	20	24	83
Yankee Fork-and tributaries	2	2	NA	1	2	1	1	2	1	2	1	2	18	22	82
Thompson	1	2	1	1	2	2	1	1	1	1	1	2	16	24	67
Squaw	1	2	1	1	2	1	1	1	1	1	1	2	15	24	63
Peach	0	2	0	1	2	1	0	1	0	1	1	2	11	24	46
French	0	2	0	1	2	1	0	1	0	1	1	1	11	24	46
Kinnikinnick	0	2	1	1	2	0	0	1	0	1	1	2	11	24	46
Salmon(Yankee Fork-Valley Creek, including Valley Creek)															
Valley- above Stanley Lake Creek	2	2	2	2	2	2	2	2	1	2	1	2	22	24	92
Big Casino	2	2	1	1	2	2	1	2	1	2	1	2	19	24	79
Elk	2	2	2	1	2	2	1	2	0	2	1	2	19	24	79

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	Stream Connectivity* and Size			Habitat			Fisheries								
	Stream connectivity to mainstem (current)	Stream Connectivity to mainstem (potential)	Size of tributary stream	Habitat Quality (existing)	Habitat Quality (potential)	Lack of other barriers besides diversions	Naturalized Anadromous Fish Life History Expression (current)	Naturalized Anadromous Fish Life History Expression (potential)	Bull Trout Life History Expression (current)	Bull Trout Life History Expression (potential)	Resident Life History Expression (current)	Resident Life History Expression (potential)	Total Score	Possible Score	Adjusted Percent Total
Iron (Valley Creek)	1	2	1	1	2	2	1	2	0	1	1	2	16	24	75
Goat (Valley Creek)	1	2	1	1	2	2	1	2	0	1	1	2	16	24	71
Meadow	1	2	1	1	2	1	0	1	0	1	1	2	13	24	54
Salmon (Valley Creek - Headwaters)															
4th of July	1	2	2	1	2	2	1	2	2	2	2	2	21	24	75
Main Salmon River above Pole Creek	1	2	1	1	2	2	2	2	0	1	1	2	17	24	75
Smiley	1	2	1	1	2	2	1	2	0	2	1	2	17	24	75
Huckleberry Creek	2	2	1	1	2	2	1	2	0	2	1	2	18	24	75
Pole	1	2	2	1	2	2	1	2	0	2	1	2	18	24	71
Beaver	1	2	1	1	2	1	1	2	0	2	1	2	16	24	71
Williams	1	2	1	1	2	1	1	2	0	2	1	2	16	24	67
Gold	1	2	1	1	2	1	1	2	0	2	1	2	16	24	67
Champion	1	2	1	1	2	2	1	2	1	2	1	2	18	24	63
Big Lake Creek (above the lake)	1	1	2	1	2	1	0	0	0	2	2	2	14	24	58
Boundary	0	2	1	1	2	0	0	2	0	2	1	2	13	24	54
Fisher	0	2	1	1	2	1	0	1	0	2	1	2	13	24	54
North Fork															
Pierce	2	2	2	2	2	2	1	2	0	1	2	2	20	24	83
Mainstem North Fork	2	2	NA	1	2	2	1	2	1	2	1	2	18	22	82
Dahlonega	2	2	2	2	2	2	1	2	0	1	1	2	19	24	79
Hughes	2	2	1	1	2	1	2	2	1	2	1	2	19	24	79
Ditch	2	2	1	1	2	1	1	2	0	1	1	2	16	24	67
Hull	1	2	1	1	2	1	1	1	0	1	1	2	14	24	58
Lemhi															
Hayden (except Basin)	2	2	2	2	2	2	2	2	2	2	2	2	24	24	100
Kenney	2	2	1	2	2	2	1	2	1	2	1	2	20	24	83
Mainstem Lemhi - Hayden Creek to Leadore	2	2	NA	1	2	2	2	2	1	1	1	2	18	22	79
Mainstem Lemhi- Agency Creek to Hayden Cr.	2	2	NA	1	2	2	1	2	1	1	1	2	17	22	77
Bohannon	1	2	1	1	2	2	1	2	1	2	1	2	18	24	75

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	Stream Connectivity* and Size			Habitat			Fisheries								
	Stream connectivity to mainstem (current)	Stream Connectivity to mainstem (potential)	Size of tributary stream	Habitat Quality (existing)	Habitat Quality (potential)	Lack of other barriers besides diversions	Naturalized Anadromous Fish Life History Expression (current)	Naturalized Anadromous Fish Life History Expression (potential)	Bull Trout Life History Expression (current)	Bull Trout Life History Expression (potential)	Resident Life History Expression (current)	Resident Life History Expression (potential)	Total Score	Possible Score	Adjusted Percent Total
Big Timber	0	2	2	1	2	2	1	2	1	2	1	2	18	24	75
Big Springs	2	2	2	1	2	2	1	2	0	0	2	2	18	24	75
Pattee	1	2	1	1	2	2	0	1	1	2	1	2	16	24	67
Big Eightmile	1	2	1	1	2	1	0	2	1	2	1	2	16	24	67
Agency	1	2	1	1	2	1	2	2	0	1	1	2	16	24	67
Benedict Little Springs	2	2	1	1	2	2	1	2	0	0	1	2	16	24	67
Mainstem Lemhi- mouth to Agency Creek	1	2	NA	1	2	1	1	1	1	1	1	2	14	22	64
Eighteenmile	1	2	1	1	2	1	0	2	1	1	1	2	15	24	63
Lee	1	1	1	1	2	1	0	2	1	2	1	2	15	24	63
Hawley	0	2	1	1	2	1	0	1	1	2	1	2	14	24	58
Wimpey	1	2	1	1	2	1	0	2	0	1	1	2	14	24	58
Canyon	1	2	1	1	2	2	0	2	0	0	1	2	14	24	58
Mill	1	1	1	1	2	1	0	1	1	2	1	2	14	24	58
Lemhi Little Springs	1	2	1	1	2	1	1	2	0	0	1	2	14	24	58
Texas	1	1	1	1	2	1	0	2	0	1	1	2	13	24	54
Little Eightmile	1	1	1	1	2	0	0	1	1	1	1	2	12	24	50
Geertson	0	0	1	1	2	2	0	1	1	2	0	1	11	24	46
Basin (Hayden Creek)	0	1	1	1	2	1	0	1	0	1	1	2	11	24	46
Kirtley	1	1	1	0	1	1	0	1	1	1	1	1	10	24	42
Pahsimeroi															
Lower Pahsimeroi - Mouth to Hooper Lane	1	2	NA	1	2	1	1	2	1	2	1	2	16	22	73
Big	1	2	2	1	2	1	0	2	1	2	1	2	17	24	71
Middle Pahsimeroi (Hooper Lane to McCoy Lane, including tributaries)	1	2	2	1	2	1	0	2	1	2	1	2	17	24	71
Little Morgan	0	2	1	1	2	1	0	2	1	2	1	2	15	24	68
Falls	0	2	2	1	2	1	0	1	2	2	1	2	16	24	67
Patterson	0	2	1	1	2	1	0	2	1	2	1	2	15	24	63
Upper Pahsimeroi (McCoy Lane to headwaters, including	0	1	2	1	2	2	0	0	1	2	1	2	14	24	58

	Stream Connectivity* and Size			Habitat			Fisheries								
	Stream connectivity to mainstem (current)	Stream Connectivity to mainstem (potential)	Size of tributary stream	Habitat Quality (existing)	Habitat Quality (potential)	Lack of other barriers besides diversions	Naturalized Anadromous Fish Life History Expression (current)	Naturalized Anadromous Fish Life History Expression (potential)	Bull Trout Life History Expression (current)	Bull Trout Life History Expression (potential)	Resident Life History Expression (current)	Resident Life History Expression (potential)	Total Score	Possible Score	Adjusted Percent Total
tributaries)															
Sulphur	0	1	1	1	2	1	0	1	0	0	1	2	10	24	42
East Fork															
Germania	2	2	2	2	2	2	1	2	2	2	2	2	23	24	96
Mainstem East Fork - Herd Creek to Germainia	2	2	NA	1	2	2	2	2	2	2	2	2	21	22	95
Herd	2	2	2	1	2	2	2	2	2	2	1	2	22	24	92
Upper EF - above West Pass	2	2	2	1	2	2	1	2	1	2	1	1	19	24	79
West Pass	1	2	1	1	2	2	0	1	2	2	1	2	17	24	71
Big Boulder	1	2	1	1	2	1	1	2	1	2	1	2	17	24	71
Bowery	1	2	1	1	2	2	0	1	1	2	1	2	16	24	67
Mainstem East Fork - Mouth to Herd Creek*	2	2	NA	1	2	2	1	1	1	1	1	2	16	22	67

* - Connectivity is defined as the presence of water and does not currently consider the adequacy of flows or depth for fish passage.

Table 3. Streams and reaches rated for biological and non-biological factors, using the SHIPUSS system. Priority I streams are those receiving at least 70% of possible points. Priority II streams are those receiving between 50% and 69% of available points, and Priority III streams are those receiving less than 50% of available points. Streams can only be compared within the same watershed, since unique biologic, geologic, ecologic, social, and other characteristics interact to preclude comparisons across watersheds. The adjusted percent total adjusts for the possibility that a stream may receive a Not Applicable (NA) rating in some categories. See Table 1 and narrative for a complete description of categories. 2 = High; 1 = Medium; 0 = Low.

		Non-Biological Factors								
	Biological Factors Score (from Table 1)	Expected cost:benefit	Potential to increase flows via leases or acquisitions	Potential to increase flows through irrigation or mgt improvements	Simplicity of resolving diversion issues	Potential for diversion consolidation	Simplicity of resolving screening issues	Total Score	Possible Score	Adjusted Percent Total
Salmon (MF-NF)										
Squaw	22	2	1	2	2	NA	2	31	34	91
Indian	21	2	1	2	2	NA	2	30	34	88
Owl	21	1	NA	2	2	NA	2	28	32	88
Upper Panther (above Blackbird, including mainstem and tributaries)	20	2	1	NA	2	2	2	29	34	85
Pine	20	1	1	2	2	1	2	29	36	81
Moose	20	1	NA	NA	NA	NA	NA	21	26	81
Lower Panther (below Blackbird, including mainstem and tributaries)	18	1	NA	NA	NA	NA	NA	19	24	79
Spring	22	2	0	1	1	0	1	27	36	75
Boulder	22	2	0	0	0	0	1	25	36	69
Colson	19	2	0	1	1	0	1	24	36	67
Lake	15	0	NA	NA	NA	NA	NA	15	26	58
Dump	11	1	NA	NA	NA	NA	NA	12	26	46
East Boulder	11	0	NA	NA	NA	NA	NA	11	26	42
Sage	10	1	NA	NA	NA	NA	NA	11	26	42
Salmon(NF-Pah)										
Hat	19	2	2	2	2	2	2	31	36	86
Twelvemile	17	2	2	2	2	2	2	29	36	81
Iron	19	1	1	2	2	2	2	28	36	78
Carmen	20	2	1	2	1	1	1	28	36	78
4th of July	20	1	1	2	1	1	1	27	36	75
Tower	17	1	1	1	2	1	1	24	36	67

		Non-Biological Factors								
	Biological Factors Score (from Table 1)	Expected cost:benefit	Potential to increase flows via leases or acquisitions	Potential to increase flows through irrigation or mgt improvements	Simplicity of resolving diversion issues	Potential for diversion consolidation	Simplicity of resolving screening issues	Total Score	Possible Score	Adjusted Percent Total
Williams	13	2	2	2	2	1	1	23	36	64
Wagonhammer	14	1	NA	NA	NA	NA	NA	15	26	58
Mainstem Salmon River - North Fork to Pahsimeroi	14	0	NA	1	1	1	NA	17	30	57
Lake	13	1	NA	2	0	NA	2	18	32	56
Wallace	11	1	1	1	1	1	1	17	36	47
Salmon(Pah-EF)										
Morgan	20	2	1	1	2	1	1	28	36	78
Challis	19	1	2	2	0	2	1	27	36	75
Mainstem Salmon River - Pahsimeroi to East Fork (12 Mile)	17	1	1	1	1	1	NA	22	32	69
Garden	17	1	1	1	1	1	1	23	36	64
Bayhorse	14	2	1	2	1	2	1	23	36	64
Mainstem Salmon River - Pahsimeroi - East Fork (exc. 12 Mile)	15	0	NA	1	1	1	NA	18	30	60
Salmon (EF-YF)										
Yankee Fork-and tributaries	18	1	NA	NA	NA	NA	NA	18	24	75
Squaw	15	2	2	2	2	NA	2	25	34	74
Slate	20	1	1	1	1	1	1	26	36	72
Mainstem Salmon River-East Fork to Headwaters	19	1	1	1	1	1	1	24	34	71
Thompson	16	1	2	1	1	2	2	25	36	69
Peach	11	1	2	1	1	2	1	19	36	53
French	11	1	1	1	1	1	1	17	36	47
Kinnikinnik	11	1	NA	NA	NA	NA	NA	12	26	46
Salmon(Yankee Fork-Valley Creek, including Valley Creek)										
Valley- above Stanley Lake	22	2	NA	NA	NA	NA	NA	24	26	92
Elk	19	2	1	2	2	1	1	28	36	78
Big Casino	19	1	2	2	1	NA	1	26	34	76
Iron (Valley Creek)	16	1	1	1	1	2	1	23	36	64

		Non-Biological Factors								
	Biological Factors Score (from Table 1)	Expected cost:benefit	Potential to increase flows via leases or acquisitions	Potential to increase flows through irrigation or mgt improvements	Simplicity of resolving diversion issues	Potential for diversion consolidation	Simplicity of resolving screening issues	Total Score	Possible Score	Adjusted Percent Total
Goat (Valley Creek)	16	1	1	1	1	2	1	23	36	64
Meadow	13	1	1	1	1	2	1	20	36	56
Salmon (Valley Creek - Headwaters)										
4th of July	21	2	2	1	2	NA	NA	28	32	88
Pole	18	2	2	2	2	NA	NA	26	32	81
Beaver	16	1	2	1	2	2	2	26	36	72
Champion	18	1	2	1	1	2	1	26	36	72
Huckleberry Creek	18	1	2	1	1	NA	NA	23	32	72
Main Salmon River above Pole Creek	17	2	1	1	1	1	2	25	36	69
Smiley	17	1	1	1	1	1	1	23	36	64
Williams	16	1	1	1	1	1	1	23	36	64
Gold	16	1	1	1	1	1	1	22	36	61
Boundary	13	1	1	1	1	NA	2	19	34	56
Fisher	13	1	1	1	1	2	1	20	36	56
Big Lake Creek (above the lake)	14	1	1	1	1	1	1	20	36	56
North Fork										
Pierce	20	2	NA	NA	NA	NA	NA	22	26	85
Hughes	19	1	NA	NA	2	1	2	25	32	78
Mainstem North Fork	18	1	0	1	1	1	NA	22	32	69
Dahlonega	19	1	0	2	0	0	1	23	36	64
Ditch	16	1	0	1	0	0	1	19	36	53
Hull	14	1	0	2	0	0	1	18	36	50
Lemhi										
Kenney	20	2	2	2	2	2	2	32	36	89
Hayden (except Basin)	24	1	1	1	1	1	NA	29	34	85
Mainstem Lemhi - Hayden Creek to Leadore	18	2	2	2	1	1	1	27	34	79
Bohannon	18	2	2	2	1	2	1	28	36	78
Big Springs	18	2	1	1	2	2	2	28	36	78
Mainstem Lemhi- Agency Creek to Hayden Cr.	17	2	2	2	1	1	1	26	34	76

		Non-Biological Factors								
	Biological Factors Score (from Table 1)	Expected cost:benefit	Potential to increase flows via leases or acquisitions	Potential to increase flows through irrigation or mgt improvements	Simplicity of resolving diversion issues	Potential for diversion consolidation	Simplicity of resolving screening issues	Total Score	Possible Score	Adjusted Percent Total
Big Timber	18	2	2	2	1	1	1	27	36	75
Pattee	16	2	2	1	2	1	2	26	36	72
Agency	16	2	2	2	1	1	1	25	36	69
Benedict Little Springs	16	2	NA	NA	NA	NA	NA	18	26	69
Big Eightmile	16	2	1	2	1	2	1	25	36	69
Eighteenmile	15	2	2	2	1	1	1	24	36	67
Lemhi Little Springs	14	2	2	2	1	2	1	24	36	67
Mainstem Lemhi- mouth to Agency Creek	14	1	2	2	1	1	NA	21	32	66
Canyon	14	2	1	1	2	0	2	22	36	61
Hawley	14	1	1	1	1	1	2	21	36	58
Mill	14	1	1	2	1	1	1	21	36	58
Lee	15	1	1	1	1	1	1	21	36	58
Little Eightmile	12	1	1	2	1	1	2	20	36	56
Texas	13	1	1	1	1	1	1	19	36	53
Wimpey	14	1	0	1	1	1	1	19	36	53
Basin Creek (Hayden Creek)	11	0	0	1	1	1	1	15	36	42
Kirtley	10	0	1	1	1	1	1	15	36	42
Geertson	11	1	1	0	0	0	1	14	36	39
Pahsimeroi										
Lower Pahsimeroi - Mouth to Hooper Lane	16	2	2	2	0	1	2	25	34	74
Big	17	1	2	2	1	1	2	26	36	72
Middle Pahsimeroi (Hooper Lane to McCoy Lane, including tributaries)	17	2	2	2	0	2	1	26	36	72
Falls	16	1	2	2	1	2	2	26	36	72
Little Morgan	15	1	1	1	1	2	2	23	36	64
Upper Pahsimeroi (McCoy Lane to headwaters, including tributaries)	14	1	2	2	1	2	1	23	36	64
Patterson	15	1	1	1	0	1	1	20	36	56

		Non-Biological Factors								
	Biological Factors Score (from Table 1)	Expected cost:benefit	Potential to increase flows via leases or acquisitions	Potential to increase flows through irrigation or mgt improvements	Simplicity of resolving diversion issues	Potential for diversion consolidation	Simplicity of resolving screening issues	Total Score	Possible Score	Adjusted Percent Total
Sulphur	10	0	2	2	1	1	1	17	36	47
East Fork										
Germania	23	1	1	1	2	NA	1	29	34	85
Herd	22	2	2	1	1	NA	2	28	34	82
Upper EF - above West Pass	19	1	2	NA	NA	NA	2	24	30	80
Mainstem East Fork - Herd Creek to Germainia	21	1	1	1	1	1	1	27	34	79
West Pass	17	1	1	1	1	1	1	23	36	64
Bowery	16	1	1	1	1	NA	1	21	34	62
Mainstem East Fork - Mouth to Herd Creek	16	1	1	1	1	1	NA	21	34	62
Big Boulder	17	0	1	1	1	0	2	22	36	61

APPENDIX A. Upper Salmon Basin Watershed Project (USBWP) Technical Team members and other technical experts involved with the development of SHIPUSS.

NAME (capacity)	TITLE	AFFILIATION
Dan Blake (review)	Natural Resource Specialist	NOAA Fisheries
Arnie Brimmer (technical)	Regional Anadromous Fishery Biologist	IDFG/USBWP TT
Janna Brimmer (editorial, review, technical)	Fish and Wildlife Biologist	USFWS/ USBWP TT
Roxanne Brown (Review)	Senior Water Resource Agent	Idaho Department of Water Resources/ USBWP TT
Tom Curet (technical)	Regional Fishery Manager	IDFG/ USBWP TT
Kate Forster (technical)	Fisheries Biologist	BLM, Challis FO/ USBWP TT
Bart Gamett (technical)	Fisheries Biologist	USFS, SCNF, Lost River and Challis RD
Dan Garcia (technical)	Fisheries Biologist	USFS, SCNF, North Fork RD
Tom Herron (review)	Water Quality Analyst	Idaho Department of Environmental Quality/ USBWP TT
Ted Koch (review)	Fish and Wildlife Biologist	USFWS
Andy Kohler (technical)	Research Biologist	Shoshone-Bannock Tribes
Bob Loucks (review, technical)	Citizen	USBWP TT
Jeff Lutch (review, technical)	Fisheries Biologist	IDFG
Mark Moulton (technical)	Fish and Water Program Leader	USFS, SNRA, Ketchum
Patrick Murphy (technical)	Regional Fishery Biologist	IDFG Screen Shop/ USBWP TT
Heather Ray (technical)	Fisheries Biologist	Shoshone-Bannock Tribes/ USBWP TT
Chris Reighn (review)	Fish and Wildlife Biologist	USFWS
Al Simpson (review)	Biologist	Bureau of Reclamation
Bruce Smith (review)	Supervisory Fisheries Biologist	USFS, SCNF
Jude Trapani (technical, review)	Fisheries Biologist	BLM, Salmon FO/ USBWP TT
Chuck Warren (technical, review)	Fisheries Biologist	IDFG Screen Shop

ABBREVIATIONS USED:
BLM = Bureau of Land Management
FO = Field Office
IDFG = Idaho Department of Fish and Game
NOAA = National Oceanic and Atmospheric Administration
RD = Ranger District
SCNF = Salmon Challis National Forest
SNRA = Sawtooth National Recreation Area
USBWP TT = Upper Salmon Basin Watershed Project Tech Team
USFS = U.S. Forest Service
USFWS = U.S. Fish and Wildlife Service

APPENDIX B. Streams for which no or insufficient data exists to warrant their current inclusion in SHIPUSS. Federal and state land management agencies in the Upper Salmon River Basin will attempt to survey as many of these streams as possible for prioritization in SHIPUSS.

Salmon River (Middle Fork to North Fork)

Salmon River (North Fork to Pahsimeroi)

McKim Creek	Cow Creek

Salmon River (Pahsimeroi to East Fork)

Ellis Creek	Warm Springs Cr.

Salmon River (East Fork to Yankee Fork)

Holman Creek[1]	Burnt Creek	Gardner Creek

Salmon River (Yankee Fork to Headwaters)

Rough Creek[2]	Little Casino Cr.	Hell Roaring Creek

North Fork

Lemhi River

Pratt Creek	Haynes Creek	McDevitt Cr.

Pahsimeroi River

East Fork Salmon River

Road Creek	Pine Creek	Little Boulder Cr.	Sheep Creek

[1] Holman Creek was electrofished in 2004 by USFS and cutthroat trout and rainbow trout are present. No habitat surveys were conducted.
[2] Rough Creek was electrofished in 2004 by USFS and cutthroat trout and brook trout are present. No habitat surveys were conducted.

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This version supersedes all previous versions

APPENDIX C. Perennial streams not included in this prioritization, and not scheduled for additional surveys. These streams may either be too small to support significant numbers of fish, or may have no problems that would be addressed by restoration activities targeted by SHIPUSS. These streams may be included in the SHIPUSS prioritization in the future if data shows their inclusion is warranted.

Salmon River (Middle Fork to North Fork)

Long Tom Creek	Shell Creek	Ebenezer Creek	Cove Creek Line Creek
Dutch Oven Creek	Big Sheepeater Cr.	Little Sheepeater Cr.	Little Spring Creek
Transfer Gul.	Hale Gulch	Little Sage Creek	Fan Gulch
Buster Gulch	Camel Gulch	Rose Gulch	

Salmon River (North Fork to Pahsimeroi)

Fernster Creek	Jesse Creek	Turner Creek	Pollard Can.
Elf Creek	Sevenmile Cr.	Hotsprings Cr	Henry Creek
Birch Creek	Camp Creek	Briney Creek	Second Creek
Rattlesnake Cr	Lost Creek	Deer Creek	Warm Spring
Cabin Creek	Poison Creek	Ezra Creek	Allison Creek

Salmon River (Pahsimeroi to East Fork)

Birch Creek	Rattlesnake Creek	Lyon Creek	Sink Creek
Birch Creek			

Salmon River (East Fork to Yankee Fork)

Spud Creek	Potoman Creek	Spring Creek	Mill Creek
Beaver Creek	Cold Creek	Treon Creek	Elk Creek

Salmon River (Yankee Fork to Headwaters)

Blind Creek	Four Aces Cr.	Nip and Tuck Cr.	Cleveland Cr.
Mays Creek	Warm Creek	Lost Creek	Taylor Creek

North Fork

Big Silver Lead Creek	Little Silver Lead Cr.	Dry Creek	Trail Creek
Copper Creek	Roske Creek	Bills Canyon	Little Hull Cr.
Carl Canyon	Lick Creek	Votler Creek	Friedorf Creek
Johnson Gulch	Hammerean Creek	Quartz Creek	Deep Creek
Elk Creek	Trapper Gulch	Vine Creek	State Creek
Moose Creek	West Fork North Fork		

Lemhi River

Withington Creek	Sandy Creek	Yearian Creek	Reese Creek
Peterson Creek			

East Fork Salmon River

Spar Canyon	McDonald Creek	Fox Creek	Marco Creek
Big Lake Creek	Bluett Creek	Baker Creek	Wickiup Cr.
Deer Creek			

Pahsimeroi River

Lawson Creek	Trail Creek

APPENDIX D. Perennial streams that have been removed from the prioritization either because all conservation activities have been accomplished, or no projects remain that fall within the scope of SHIPUSS. Streams that scored at least 95% overall have been included here. The rankings have been included here in parentheses (biological factors/total score).

Salmon River (Middle Fork to North Fork)

Salmon River (North Fork to Pahsimeroi)

Salmon River (Pahsimeroi to East Fork)

Salmon River (East Fork to Yankee Fork)
Warm Springs Creek (100/100)

Salmon River (Yankee Fork to Headwaters)
Basin Creek (96/96) score reduced because this is a small tributary
Redfish Lake Creek (96/96) score reduced because the weir serves as a partial barrier
Alturas Lake Creek (96/96) score reduced due to habitat degradation from a road blowout. Restoration efforts on Alturas Lake Creek by the USFS are ongoing.

North Fork
Twin Creek (100/100)
Sheep Creek (100/100)

Lemhi River

East Fork Salmon River

Pahsimeroi River

APPENDIX E. Persons to contact for additional information on SHIPUSS.

For general information on the history, development, or process, contact:

Janna Brimmer
Fish and Wildlife Biologist
US Fish and Wildlife Service
1206 South Challis Street
Salmon, Idaho 83467
(208)756-5190
Janna_Brimmer@fws.gov

For specific information on Fisheries survey methods or data, contact:

Tom Curet
Regional Fishery Manager
Idaho Department of Fish and Game
P.O. Box 1336
Salmon, Idaho 83467
(208)756-2271
tcuret@idfg.idaho.gov

Paddy Murphy
Regional Fishery Biologist
Idaho Department of Fish and Game
P.O. Box 1336
Salmon, Idaho 83467
(208)756-6022
pmurphy@idfg.idaho.gov