Technical Memorandum No. 1
Stream Flow Management Framework
Draft

WRIA 35 – Middle Snake River Basin

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1.0 Introduction

The Planning Unit for Water Resources Inventory Area (WRIA) 35 is developing a comprehensive stream flow management strategy as part of the watershed management plan. This technical memorandum documents the general stream flow management framework and stream flow management objectives under which the strategy will be developed. Specific recommendations will be developed and documented in subsequent technical memoranda.

The flow management framework is intended to be consistent with the Watershed Planning Act, which requires that planning units address the instream flow component, protect flows for fish, and provide water for future out-of-stream needs. In addition, the planning units must develop management strategies to return flows to the streams to the extent practicable. Thus, the stream flow management framework is comprised of four primary components:

- **Regulatory flow *protection*:** developing recommendations for minimum instream flows and updated stream closures.
- **Non-regulatory flow *enhancement*:** developing an approach for flow enhancement goals (target flows) based on general operational and structural (for water use and land use) strategies for water management.
- **Monitoring:** recommending continued and additional stream flow monitoring to implement the regulatory and non-regulatory strategies.
- **Water supply-related recommendations:** recommending policies to meet rural and urban water supply needs consistent with the instream flow recommendations.

Developing recommendations for minimum instream flows and stream closures provide "protection" for instream flows from future appropriation, while the target flows provide a basis to guide flow enhancement efforts to add flows back to the stream and improve current conditions.

1.1 Flow Management Goals

The following goals guide the instream flow management framework. These goals may need further discussion and refinement by the Planning Unit as the strategy is developed. The goals listed below are based on the overall "potential planning goals" developed by the Planning Unit (April 2003) as part of the Phase 1 planning process.

- **Protect stream flows to maintain habitat conditions for salmonids.**
  - Update surface water source limitations or recommend new stream closures.
  - Recommend minimum instream flows to potentially adopt into rule.
    - Develop long-term flow monitoring data.
    - Conduct instream flow studies.
- **Enhance/restore stream flows to improve habitat conditions for salmonids.**
  - Develop flow enhancement targets (target flows).
    - Evaluate estimate of actual water usage.
    - Evaluate long-term water use projections.
  - Implement land use and water use strategies to improve instream flows.

- **Provide long-term reliable and predictable water supplies for human uses consistent with projected growth and densities in County and City land use plans.**
  - Develop water reservations.
  - Implement land use and water use strategies to improve instream flows (including storage alternatives).
- **Protect existing water rights and private property rights.**

These goals provide the basis for developing stream-specific stream flow management objectives to be integrated with the water supply, water quality, and habitat components of the watershed plan.

1.2 Stream Flow Management Issues

Management of stream flows is a critical component of the watershed plan. Stream flows are an important determinant of habitat conditions for fish and other aquatic life in streams throughout the region. Stream flows can be altered substantially by human activity in the watershed, as water is either diverted from a stream or withdrawn from an aquifer that may be connected with a surface stream. Other activities affect flows by changing how water drains from lands within the watershed. These activities include agriculture, forestry, land use and development practices and associated alterations to floodplains and associated wetlands. During the late summer and early fall, even a small reduction in stream flow from water withdrawals can have significant impacts on aquatic habitat.

As discussed in the WRIA 35 Level 1 Assessment, it is not expected that significant new out-of-stream demands will develop over the next 25 years. At the same time, the Planning Unit recognizes that water supply is essential for communities, citizens and businesses. Fortunately, the Planning Unit for the Middle Snake watershed is in the position of developing a stream flow management plan before significant development and overuse of the water supply has occurred. As a result, opportunities exist to proactively manage stream flows which balance stream flow protection with water supply development.

Development can impact the high flow regime as well as the low flow regime. It is important to manage flows during dry periods of the year, typically in the late summer and early fall, when stream flows drop to their lowest levels. Adequate flows are essential to provide habitat for fish and other aquatic life and to provide adequate flow for safe fish passage. High flows that occur from runoff in the winter and spring are also important in moving sediment through a river system and creating and maintaining proper habitat conditions within the stream channel and floodplain. Excessively high flood conditions can be damaging to fish habitat, as well as property and human safety.

1.3 Subbasin Plans – Stream Flow Limiting Factors

Numerous studies on protecting, mitigating, and enhancing aquatic and terrestrial habitat have been conducted for the region. Since stream flows are an important component of aquatic habitat, these studies are used in this assessment to identify the priority flow limited streams. The key documents used in this assessment are the "Subbasin Plans" prepared for the Northwest

Power and Conservation Council under the Pacific Northwest Electric Power Planning and Conservation Act. The Subbasin Plans also play a significant role in addressing the requirements of the Endangered Species Act. National Marine Fisheries Service (NMFS) and United States Fish and Wildlife Service (USFWS) intend to use the Subbasin Plans to help in recovery of ESA-listed species. In addition, the Council, Bonneville Power Administration, NMFS, and USFWS will use the adopted Subbasin Plans to help meet subbasin and province requirements under the 2000 Federal Columbia River System Biological Opinion.

The Subbasin Plans integrate other previous planning documents and their own modeling studies to identify priority stream reaches for "protection" or "restoration" to benefit focal aquatic species. For the Middle Snake River Watershed, the Tucannon River Subbasin Plan, Asotin Creek Subbasin Plan, and Lower Snake River Subbasin Plan were reviewed. Several stream reaches were identified as priorities for protection and restoration. The following streams were identified as having stream flows as key limiting factors:

- Tucannon River – mouth of Pataha Creek to hatchery
- Lower George Creek
- Almota Creek
- Deadman Creek

Other stream reaches identified as priorities for protection or restoration have other limiting factors besides stream flow that are more limiting, such as riparian function, bank confinement, or sediment loading. In some cases, improving stream flows (high and low flows) would improve other limiting factors such as bedscour, water temperature, and sediment loading. However, other habitat-related mitigation such as riparian plantings may address these factors more directly than improving stream flows. Therefore, the stream flow management framework focuses on those stream reaches where stream flow improvements would be most beneficial. Other "non-flow" restoration techniques can be applied to these reaches as well.

2.0 Stream Flow Management Points

Management points are used to monitor and control upstream activities and impacts so that downstream watershed objectives are met. As such, management objectives can be defined for both human and aquatic beneficial use for each management point. Furthermore, data can be summarized and logically grouped by management point. For example, an inventory of instream (fish use) and out of stream (human use) water demands can be made. This inventory gives a summary of the basic water needs as well as the timing associated with those needs. Historical flow data from flow gauges can be used to indicate whether or not upstream water needs for both humans and fish may be met under historical flow conditions and water use.

2.1 Proposed Management Points

Seventeen (17) preliminary management points are proposed for WRIA 35 as shown in Exhibit 1. The related data used to locate the management points are represented in Exhibit 2. Table A-4 lists the gauge information for the stream flow gauges shown in Exhibit 3. The 17 management points attempt to account for as much of the stream flow contribution in the

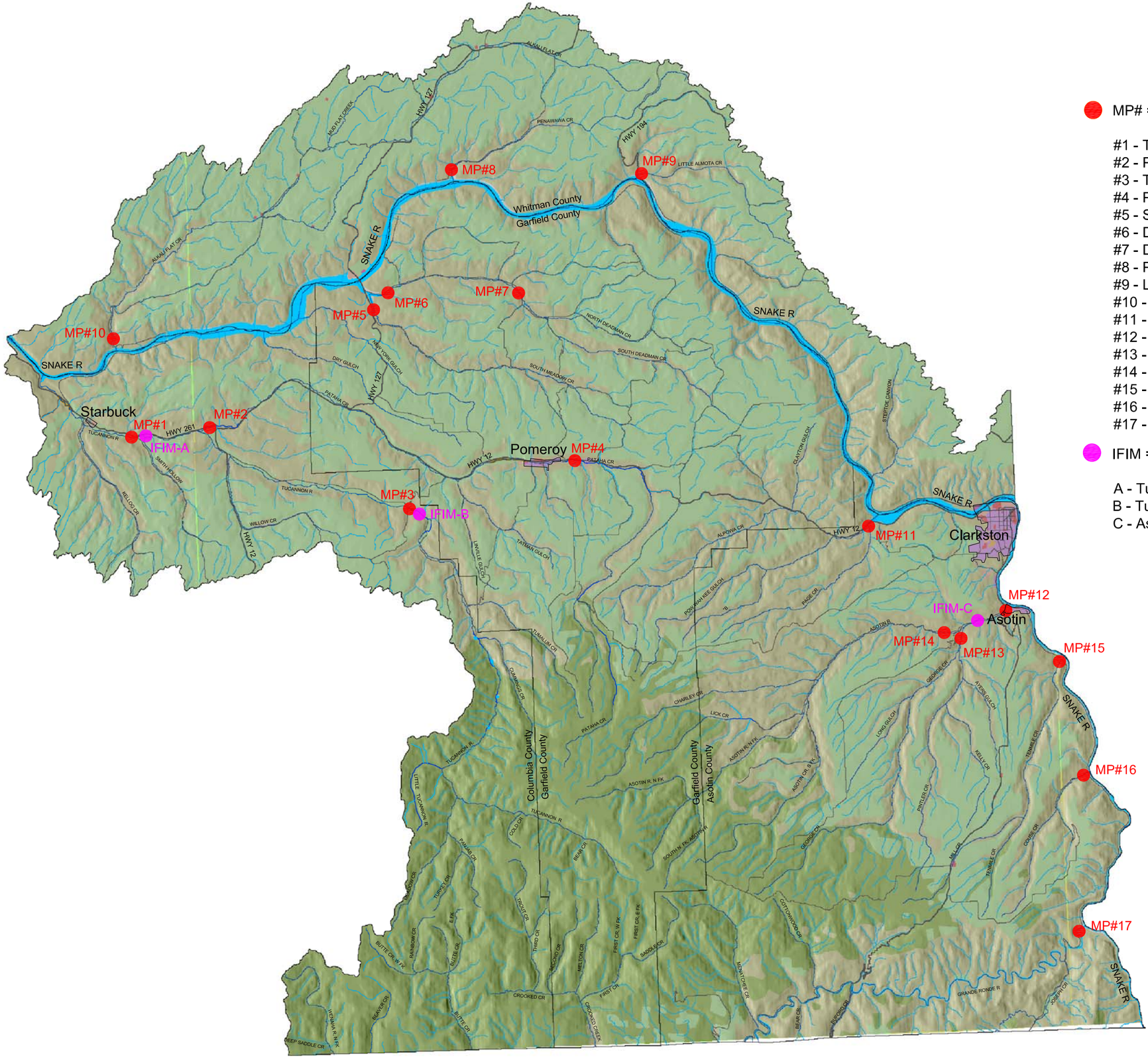
watershed as practicable, while also considering the factors described above. The location of each management point was determined by considering fish presence, out-of-stream demands, and proximity of an area to an existing gauge. In most cases the locations of the management points coincide with existing stream gauges, which are already monitoring upstream activities. Appendix A includes additional discussion on the management point selection factors.

Table 1 lists the key factors that led to the selection of the management points. Table A-1 summarizes the flow issues and some of the advantages and disadvantages of choosing the locations for instream flow MPs. Table A-2 in the Appendix summarizes the currently available data for each MP. As the assessment develops and the management point locations are finalized, Table A-2 will be refined, especially with regards to water use and water rights estimates. Note that some of the management points have more available data than others.

Table 1
Key Factors Used to Identify Management Points

	Instream Flow Study	Long Period of Record	Flow Gauge Present	Focal Species Presence	Subbasin Plan Priority	Flow Limited Stream	Significant Out-of-stream use	Potential Growth	Closure/ SWSL Present
MP-1Tucannon below Smith Hollow	●	●	●	●	●	●	●	●	●
MP-2 Pataha Cr. at mouth			●	●			●		●
MP-3 Tucannon River at Marengo	●		●	●	●	●	●		●
MP-4 Pataha Creek at Pataha			●	●			●	●	●
MP-5 Meadow Creek at mouth			●	●					●
MP-6 Deadman Creek at mouth			●	●	●	●			●
MP-7 Deadman Cr. below forks			●	●	●	●			●
MP-8 Penawawa Creek at mouth			●	●	●	●			●
MP-9 Little Almota Creek at mouth			●	●	●	●			
MP-10 Alkali Flat Creek at mouth				●			●		●
MP-11 Alpowa Creek at mouth			●		●				●
MP-12 Asotin Creek at mouth	●	●	●	●	●		●	●	●
MP-13 George Cr. above Asotin Cr				●	●	●		●	●
MP-14 Asotin Cr. below George Cr.				●	●		●	●	●
MP-15 Tenmile Cr. at mouth			●	●	●				
MP-16 Couse Cr. at mouth			●	●					
MP-17 Grande Ronde R. at mouth				●					

Note: Factors generally apply to portion of reach upstream of the defined management point.



Legend

- MP# = Management Points

#1 - Tucannon below Smith Hollow	USGS - Gauging Station
#2 - Pataha Cr. @ Mouth	DOE - Telemetry
#3 - Tucannon at Marengo	DOE - Telemetry
#4 - Pataha Cr. @ Pataha	DOE - Manual Stage Ht.
#5 - S. Meadow Cr. @ mouth	DOE - Manual Stage Ht.
#6 - Deadman Cr. @ mouth	DOE - Telemetry
#7 - Deadman Cr. below forks	DOE - Telemetry
#8 - Penawawa Cr. @ mouth	DOE - Manual Stage Ht.
#9 - Little Almota Cr. @ mouth	DOE - Telemetry
#10 - Alkali Flat Cr. @ mouth	N/A
#11 - Alpowa Cr. @ mouth	DOE - Telemetry
#12 - Asotin Cr. @ mouth	USGS - R.T. Daily/Peak Flow
#13 - George Cr. above Asotin Cr.	DOE - Telemetry
#14 - Asotin Cr. above George Cr.	USGS - R.T. Daily Flow
#15 - Tenmile Cr. @ mouth	DOE - Manual Stage Ht.
#16 - Couse Cr. @ mouth	DOE - Manual Stage Ht.
#17 - Grande Rounde @ mouth	N/A

- IFIM = IFIM Study Areas

A - Tucannon R. above Starbuck Dam, RM 5.8, Ecology (MP#1)
B - Tucannon R. @ Marengo, RM 24, Barber et.al. (MP#3)
C - Asotin Cr. above Asotin, WDFW (in progress) (MP#11)

EXHIBIT 1

ASOTIN PUD WRIA 35
Preliminary Management Points
& IFIM Study Areas

May 2005

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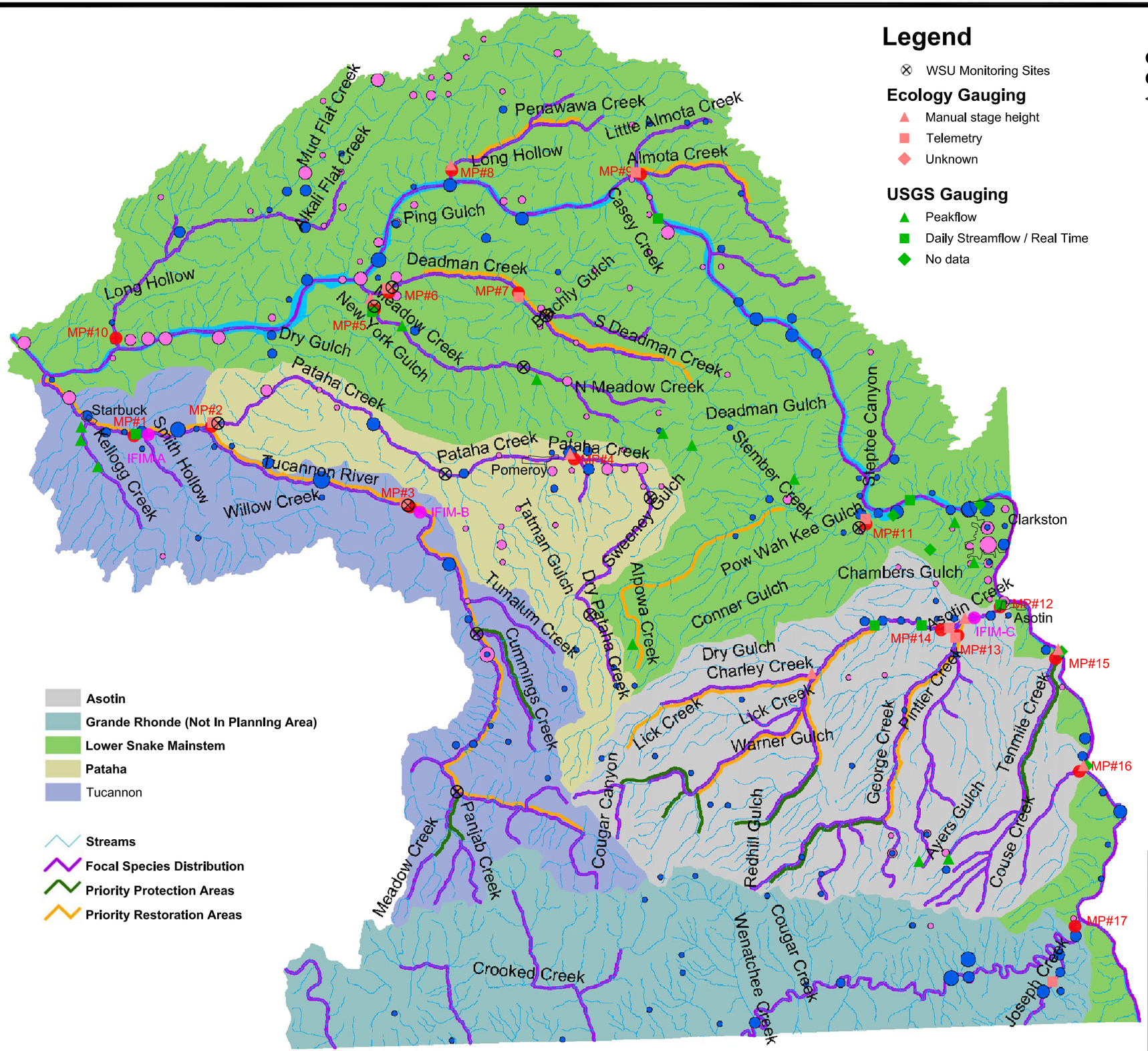

Legend

- WSU Monitoring Sites

Ecology Gauging

- Manual stage height
- Telemetry
- Unknown

USGS Gauging

- Peakflow
- Daily Streamflow / Real Time
- No data

Ground Water Rights
QA
<all other values>

- 0.0000 - 64.7600
- 67.7601 - 180.0000
- 180.0001 - 336.0000
- 336.0001 - 615.1400
- 615.1401 - 1146.5600
- 1146.5601 - 2014.0000
- 2014.0001 - 5613.0000

Surface Water Rights
QA_AFY
<all other values>

- 0.0000 - 13.8000
- 13.0001 - 40.0000
- 40.0001 - 100.0000
- 100.0001 - 170.0000
- 170.0001 - 272.0000
- 272.0001 - 520.0000
- 520.0001 - 1143.0000

MP# = Management Points

#1 - Tucannon below Smith Hollow
#2 - Pataha Cr. @ Mouth
#3 - Tucannon at Marengo
#4 - Pataha Cr. @ Pataha
#5 - S. Meadow Cr. @ mouth
#6 - Deadman Cr. @ mouth
#7 - Deadman Cr. below forks
#8 - Penawawa Cr. @ mouth
#9 - Little Almota Cr. @ mouth
#10 - Alkali Flat Cr. @ mouth
#11 - Alpowa Cr. @ mouth
#12 - Asotin Cr. @ mouth
#13 - George Cr. above Asotin Cr.
#14 - Asotin Cr. above George Cr.
#15 - Tenmile Cr. @ mouth
#16 - Couse Cr. @ mouth
#17 - Grande Rounde @ mouth

IFIM = IFIM Study Areas

A - Tucannon R. above Starbuck Dam, RM 5.8, Ecology (MP#1)
B - Tucannon R. @ Marengo, RM 24, Barber et.al. (MP#3)
C - Asotin Cr. above Asotin, WDFW (in progress) (MP#11)

- Asotin
- Grande Rhonde (Not In Planning Area)
- Lower Snake Mainstem
- Pataha
- Tucannon

- Streams
- Focal Species Distribution
- Priority Protection Areas
- Priority Restoration Areas

EXHIBIT 2

ASOTIN PUD WRIA 35
Management Points
Selection Factor Data

May 2005

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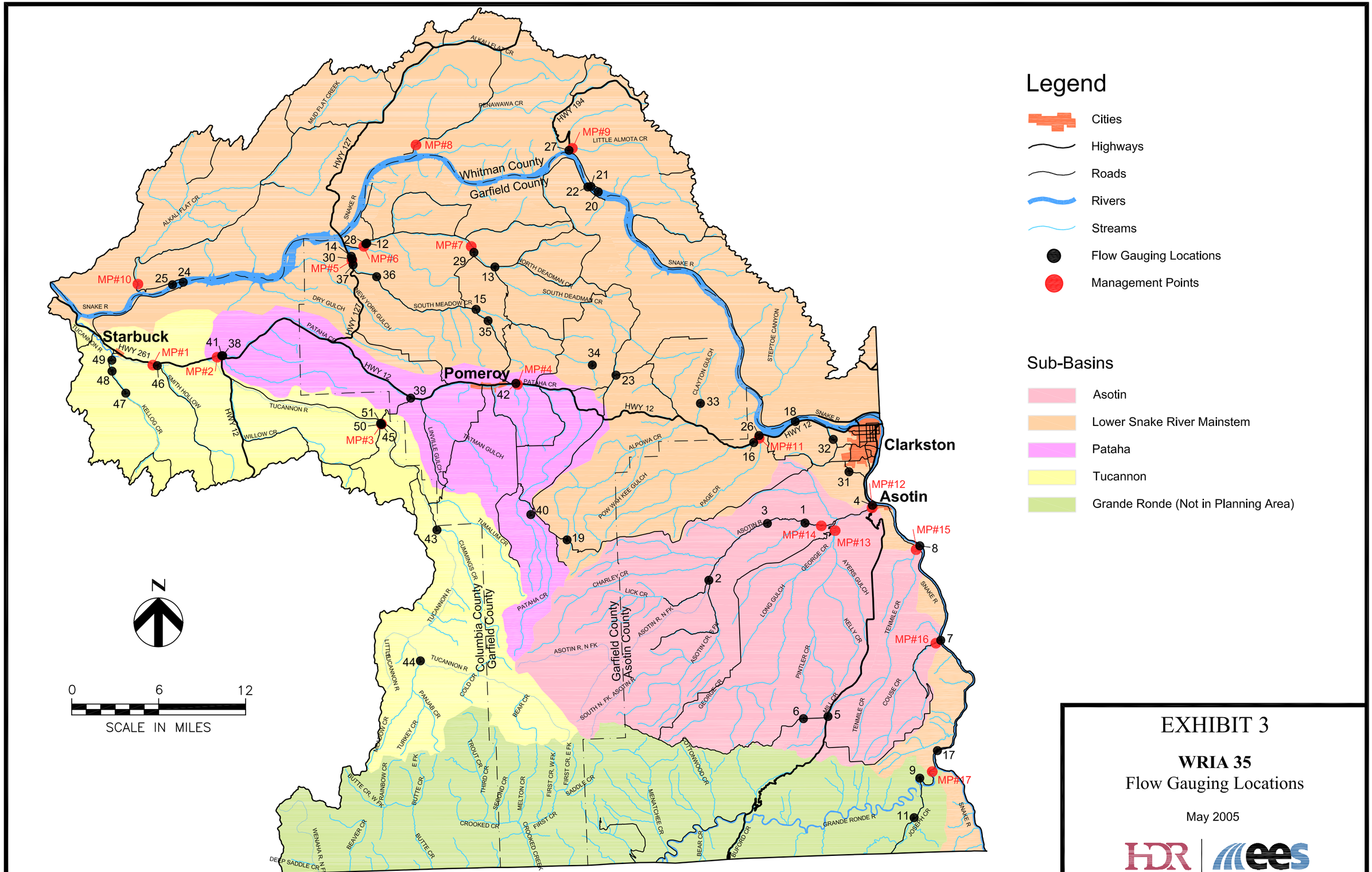
Legend
Cities
Highways
Roads
Rivers
Streams
Flow Gauging Locations
Management Points
Sub-Basins
Asotin
Lower Snake River Mainstem
Pataha
Tucannon
Grande Ronde (Not in Planning Area)
Starbuck
Pomeroy
Clarkston
Asotin
Whitman County
Garfield County
Columbia County
Garfield County
Garfield County
Asotin County
MP#1
MP#2
MP#3
MP#4
MP#5
MP#6
MP#7
MP#8
MP#9
MP#10
MP#11
MP#12
MP#13
MP#14
MP#15
MP#16
MP#17
SNAKE R
TUCANNON R
PATAHA CR
ASOTIN R
ASOTIN R, N FK
SOUTH N. FK. ASOTIN R
ALKALI FLAT CR
MUD FLAT CREEK
RENAWAWA CR
LITTLE ALMOTA CR
HWY 127
HWY 194
HWY 261
HWY 12
DRY GULCH
NEW YORK GULCH
SOUTH MEADOW CR
NORTH DEADMAN CR
SOUTH DEADMAN CR
STEPTOE CANYON
CLAYTON GULCH
ALPOWA CR
POW WAH KEE GULCH
PAGE CR
SMITH HOLLOW
KELLOG CR
WILLOW CR
LINVILLE GULCH
TATMAN GULCH
TUMALUM CR
CUMMINGS CR
CHARLEY CR
LICK CR
LONG GULCH
GEORGE CR
AYERS GULCH
KELLY CR
PINTLER CR
TENMILE CR
COUSE CR
MILL CR
LITTLE TUCANNON R
PANJAB CR
GOLD CR
BEAR CR
MEADOW CR
TURKEY CR
E FK
TROUT CR
THIRD CR
SECOND CR
MELTON CR
FIRST CR. W FK
FIRST CR. E FK
FIRST CR
SADDLE CR
COTTONWOOD CR
MENATCHEE CR
BEAR CR
BUFORD CR
GRANDE RONDE R
JOSEPH CR
BUTTE CR. W FK
RAINBOW CR
BUTTE CR
CROOKED CR
CROOKED CREEK
BEAVER CR
WENAHA R. N FK
DEEP SADDLE CR
N
0
6
12
SCALE IN MILES
EXHIBIT 3
WRIA 35
Flow Gauging Locations
May 2005
HDR
ees

2.2 Prioritization of Management Points

Due to resource and data constraints, the approach taken here is to develop specific stream flow management recommendations for those management points with sufficient data. The approach used for these "pilot management points" will then be applied to other portions of the watershed as resources and data become available through an adaptive management process. General management recommendations may also be developed watershed-wide through this process, but minimum instream flows and target flows will only be developed for a few of the management points (Category 1 below).

The following categories are defined to group the management points with this approach in mind:

- **Category 1:** Flow has been identified as a limiting factor and is a priority restoration reach (per the Subbasin Plan); information for completing minimum instream flow recommendations is available (hydrologic data and IFIM study). *Action:* develop minimum instream flow recommendations; develop target flows if appropriate; consider recommendations for administrative closures integrate, if appropriate, recommendations for minimum instream flows.

- **Category 2:** Flow has been identified as a limiting factor and is a priority restoration reach (per the Subbasin Plan); information for completing minimum instream flow recommendations is not available (generally lacking IFIM study and extended hydrologic data). *Action:* Consider recommendations for administrative closures as an option to setting minimum instream flows; consider target flows if appropriate or if data is adequate.

- **Category 3:** Flow has not been identified as a key limiting factor; flow contributes directly to Category 1 streams but do not currently have complete information available for developing minimum instream flow recommendations. *Action:* Consider recommendations for administrative closures as an option to setting minimum instream flows.

- **Category 4:** Flow has not been identified as a limiting factor and is not a tributary to categtory 1, 2, or 3 stream; however, an administrative stream closure has been defined. *Action:* Review the appropriateness of the closure and the need to develop target flows.

- **Category 5:** Flow has not been identified as a limiting factor; and no administrative stream closure has been defined. *Action:* Review whether administrative closure and target flows are appropriate.

The primary focus for developing specific recommendations will be on the Category 1 management point which includes the Tucannon River. Management recommendations for Category 2 – 5 streams will focus on updating administrative closures and identifying those management points where target flows are appropriate. Category 2 management points will also include general recommendations for potentially setting minimum instream flows in the future.

3.0 Stream Flow Management Techniques

A stream flow management strategy can be comprised of regulatory, non-regulatory, and various land use and water use controls. This section describes these techniques.

3.1 Regulatory Controls

The two primary regulatory controls on stream flow are related to setting minimum instream flows and defining surface water source limitations or "administrative closures." The discussions below are based on the descriptions in Section 9 of the WRIA 35 Level 1 Assessment (HDR-EES, 2005).

Minimum Instream Flows

The Department of Ecology has statutory obligations concerning stream flow under chapters 90.82 and 90.54 RCW. RCW 90.82 ("2514" process) is related to the watershed planning process, while RCW 90.54 is code related to the Water Resource Act of 1971 (Ecology, 2004). Through these statutes, Ecology has been instructed by the State legislature to set stream flow levels in rule (Washington Administrative Code - WAC) in order to "protect and preserve instream resources." The flows set into rule through Ecology are referred to as "minimum instream flows" in the statutes. The Washington Department of Fish and Wildlife (WDFW) typically works with Ecology in developing minimum instream flows, based on instream flow studies for fish needs[1].

Minimum instream flows are, in effect, a water right for fish and instream values. The purpose for setting instream flows include protecting fish (RCW 90.82.010), and to provide for preservation of wildlife, fish, scenic, aesthetic and other environmental values, and navigational values [RCW 90.54.020(3)]. Further, minimum instream flows have a priority date and water rights issued after the adoption of instream flows are junior to the instream flow. The instream flow also conditions the issuance of subsequent new water rights. Traditionally, the "minimum instream flow" set into rule for a given stream has been a single rate (expressed as cubic feet per second, or CFS) listed for each month or half-month. In some instances, a single minimum flow level is applied to the whole calendar year.

Some of the most important characteristics of minimum instream flows are the following:

- Minimum instream flows do not affect <u>existing</u> water rights;
- Minimum instream flows have a priority date, similar to any water right[2];

[1] The typical foundation for development of fish-focused minimum instream flows in the State of Washington has been to use instream flow studies performed using the IFIM, including a hydraulic and habitat modeling component known as Physical Habitat Simulation (PHABSIM). This approach quantifies the relationship between flow rates and the physical area of habitat available for a given fish species and life stage.

[2] Flows adopted under RCW 90.82 will have a priority date of either: (1) two years after the Planning Unit first received funding; or (2) another date as established by a unanimous vote of the Planning Unit, but no later than the effective date of the rule adopting flows (RCW 90.82.080[2a]). Flows adopted under RCW 90.54 have a priority date of adoption.

- Any water right issued after the priority date for the minimum instream flow will be junior to it, and therefore, will include restrictions or conditions; and
- Minimum instream flows do not put water in streams, rather they are intended to protect flows.

As noted earlier, the Watershed Planning Act requires the planning units to develop strategies to supply water in quantities sufficient to satisfy instream flows for fish and to provide water for future out-of-stream uses for water when necessary[3]. As a result, minimum instream flows can be adopted with provisions to allow future water use by specifying criteria and a process for allowing the issuance of new water rights that would not be conditioned or restricted by the minimum instream flow. The potential mechanisms for establishing these allowances or exceptions to a future minimum instream flow include the following:

- Setting aside or reserving an amount of water for future use.
- Modifying existing stream closures to allow more flexibility in addressing future water needs.
- Continue to allow exempt wells under the existing statutory exemption (RCW 90.44.050).
- Approving mitigation that provides water-for-water to offset potential adverse flow effects from new permits.
- Overriding consideration of the public interest (OCPI).
- Provision that allows for changes (change in place of use, point of diversion and/or time of use) to existing water rights.

This management framework assumes that minimum instream flows will be developed for the Category 1 management points. The approach used for these pilot locations can then be applied to other management points as information becomes available.

Surface Water Source Limitations

The Department of Ecology and its predecessor agencies (Ecology) have established administrative low flow restrictions and closures on several surface water sources in the state. These are sometimes referred to by Ecology as Surface Water Source Limitations (SWSL). These SWSLs have been established largely as a result of letters of recommendation received by Ecology from WDFW or their predecessor agencies, in response to applications for water right applications filed with Ecology. In addition to these SWSL being applicable to the specific water right application, these SWSLs are used by Ecology in their decision-making process for all subsequent applications for water rights filed on the same stream or stream system.

The water right application filed that resulted in the SWSL being established has a specific location for the point of diversion. Accordingly, the resulting SWSL is typically shown as the location of the proposed point of diversion for the water right application. In many instances where an administrative low flow is established, there is no stream gauge or other means of measurement of the stream flow at that specific location.

Some of the issues related to application of the SWSLs in the overall stream flow management framework are as follows:

[3] Note: the allowance for future use is intended for residential domestic use and other small uses.

- The WDFW letter and the resulting Ecology SWSL, will show the location of the proposed point of diversion by Section, Township, and Range, however typically will not state whether the SWSL applies to the entire length of stream, portions of the stream, or tributaries to the stream.
- In most instances there is no additional documentation or basis for the establishment of these SWSL other than the initial letter received from WDFW.
- Closures tend to be less flexible in terms of addressing future water rights decisions. For example, off-stream storage or aquifer storage and recovery (ASR) would not be available in a basin closed for the entire year.

These issues will be reviewed and recommendations made with respect to revising or amending the existing SWSLs and recommending any new SWSLs based on the habitat protection priorities. The assessment will focus on the Category 1 and 2 management points for reviewing the SWSLs. The approach used to integrate the closures with minimum instream flows and target flows (see below) in these pilot streams can then be applied to the other management points.

3.2 Non-Regulatory Controls

Simply setting minimum instream flows or establishing administrative stream closures will not increase the amount of water available to support instream management objectives. Coupling flow management with enhancement is an important fish recovery strategy, and also benefits other instream needs such as recreation and water quality. Furthermore, as discussed in Section 1.0, the Watershed Planning Act requires the planning units to develop management strategies to return flows to the streams to the extent practicable, i.e., to enhance existing flows.

Thus, the stream flow management framework includes developing a voluntary flow regime to guide flow enhancement efforts. These "target flows" define flows that could reasonably be achieved within a defined time frame, with a relatively specific set of projects or actions. The target flow represents an increment of flow (e.g. in cubic feet per second) that can realistically be achieved through operational or structural improvements in irrigation and other municipal and domestic water use and management practices.

Some of the most important characteristics of target flows include the following:

- Target flows are voluntary, and thus. do not impact existing water rights or decisions on water rights applications.
- Target flows do not have a priority date, and can be adjusted as the goals of the watershed change.
- Target flows aim for achievable flow levels and capture the natural variability of stream flows (both seasonally and over long periods of time).
- A stream flow monitoring program is typically needed to measure whether target flows are being achieved.

With respect to target flows, it should be recognized that changes in the flow regime will be incremental, and may be hidden initially by larger variation in precipitation from one year to the next. In this case, measuring changes in the flow regime from management actions may take years or even decades. For this reason, a long-term view of management actions and their effects in the watershed is often necessary.

At this stage, insufficient data exists to conduct a comprehensive water balance for all of the actual water use, return flows, points of diversion and withdrawal, and place of use that would be necessary to develop quantifiable and highly accurate target flows for many of the management points. Therefore, target flows will be developed for a few management points where the most information is available. The approach can then be applied to other management points as data becomes available. It is proposed that target flows be developed for the management points under Category 1. These management points have the most available stream flow data, and are generally priorities for restoration in the watershed.

3.3 Land Use and Water Use Controls

The stream flow management framework uses a comprehensive perspective on flow management issues. As described in Section 1.2, stream flow issues arise for both high and low flow conditions. In general, it is assumed that reduced flow rates during the dry season are harmful to fish and their habitat; and that increased peak flows (i.e. flood events) from human activity can also be harmful to habitat and human property.

A range of techniques are available to manage stream flow conditions at both the low and high ends of the flow spectrum. These actions can be divided into two general categories. Management of water supply is important for stream flow, where water withdrawals deplete flows. Management of land use and related issues are important where changes to the watershed disrupt runoff and ground water recharge. This breakdown is summarized in Table 2. Note that, with the exception of water storage, water use management techniques generally do not address high flow impacts.

Table 2
Land Use and Water Use Management Techniques

Category	Technique	Affects Low Flow	Affects High Flows
Water Use	Restrict issuance of new water rights	✓	N/A
	Water conservation	✓	N/A
	Curtailment during drought conditions	✓	N/A
	Source substitution	✓	N/A
	Transfers to State Trust water rights	✓	N/A
	Enforcement actions against unauthorized water uses	✓	N/A
	Water Storage	✓	✓
Land Use	Forest practices	✓	✓
	Agriculture practices	✓	✓
	Development practices and stormwater management	✓	✓
	Floodplain management	✓	✓
	Wetlands management	✓	✓

3.4 Monitoring

In order to manage flows, streams must be monitored consistently. For purposes of the flow management framework, flow monitoring is needed to:

- Provide basic data needed to assess current status and long-term trends in stream flow.
- Provide basic data to determine how various components of the watershed contribute to flow (e.g. flow contributed by specific tributaries; gains and losses from ground water interactions, etc.).
- Assess how short-term or long-term changes in watershed conditions affect flows (e.g. land use, precipitation trends).
- Evaluate the effectiveness of specific management actions designed to improve the flow regime.

At this time, there are few stream gauges in the watershed with long periods of record. There have been several new flow gauges installed by Ecology in 2003, which will provide future data for adaptive management purposes along with the USGS gauges already operational in the watershed.

It is recognized that continued operation of gauges (and installation of any additional gauges) requires funding. As part of the development of the stream flow management recommendations and development of the watershed plan the following criteria for funding installation and operation of gauges are proposed:

- Presence of existing gauges that should be maintained permanently;
- Past record of discontinued stream gauges, which provide data that can be leveraged if new gauges are installed;
- Degree to which flow is impaired now, with potential harm to aquatic habitat;
- Size of drainage area and associated extent of habitat for aquatic life
- Priority of streams in Salmon Recovery Plan;
- Expected future changes in land use or water withdrawals, that will cause impairment of flow;
- Extent of existing urbanization, and associated feasibility of protecting or enhancing flow (e.g. consider highly urbanized subbasins less feasible)

4.0 Stream Flow Management Recommendations

The information review for each management point is used to recommend the types of short-term and long-term recommendations for each management point. The recommendations would be based on the stream flow management goals listed in Section 1.2.

In general, specific recommendations for minimum instream flows and target flows will be for the Category 1 management points. The SWSL review will be conducted for all of the existing SWSLs, and general recommendations will be made basin-wide for all streams based on presence and distribution of focal fish species. The focus of integrating the SWSLs with minimum instream flows and target flows will be on the Category 1 management points.

Near-term and future recommendations consistent with the stream flow management goals are assigned to each management point as shown in Table 3. "Near-term" recommendations are made where existing information is available to make specific (or quantitative) recommendations. "Future" recommendations will be made for those management points where additional data is needed, but where general policies may be appropriately made in the watershed plan. Adaptive management would be used to revise the long-term recommendations as necessary.

Table 3
Near-term and Future Recommendations to be Developed by Management Point

	MP-1	MP-2	MP-3	MP-4	MP-5	MP-6	MP-7	MP-8	MP-9	MP-10	MP-11	MP-12	MP-13	MP-14	MP-15	MP-16	MP-17
Category	1	3	1	3	4	2	2	2	2	4	4	1	3	3	5	5	5
Protect stream flows to maintain habitat conditions for salmonids																	
Update surface water source limitations or recommend new stream closures.	●	●	●	●	○	●	●	●	●	○	●	●	●	●	○	○	--
Recommend minimum instream flows to adopt into rule.	●	○	○	--	--	○	--	--	--	--	--	○	○	○	--	--	--
Enhance/restore stream flows to improve habitat conditions for salmonids																	
Develop flow enhancement targets (target flows).	●		●	--	--	--	--	--	--	--	--	○	○	○	--	--	--
Implement land use and water use strategies to improve instream flows.	●		●	--	--	--	--	○	○	--	--	○	○	○	--	--	--
Provide long-term reliable and predictable water supplies for human uses																	
Develop water reservations.	○	○	○	○	--	--	--	--	--	--	--	○	○	○	--	--	--
Implement land use and water use strategies to improve instream flows.	●		●	--	--	--	--	○	○	--	--	○	○	○	--	--	--

● Specific near-term recommendations to be developed with existing data under this Level 2 Assessment.

○ Future recommendations should be developed under an adaptive management approach; general recommendations to be developed under this Level 2 Assessment.

-- No recommendations will be made under this assessment for these management points for this issue.

Bibliography

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Pomeroy Conservation District. 2004. "Lower Snake Mainstem Subbasin Plan." Prepared for Northwest Power and Conservation Council. Edited by Parametrix and Economic and Engineering Services. May 28.

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Appendix

Management Point Selection Factors

Ideally, management points would completely account for the entire stream network in the watershed. Due to limited resources and often limited information, the approach taken here focuses on selecting "priority" management points for the key streams in the watershed and those streams where the management framework can be effectively demonstrated on a pilot basis. As additional resources and information become available, specific recommendations can also be developed for other streams in the watershed.

The five primary "factors" used to select the priority management point locations for WRIA 35 are as follows:

- **Availability of stream flow data.** Stream flow data provides a basis for assessing historical flow conditions and for developing realistic flow objectives. The most preferred stream flow gauge locations are those that are active and which have long periods of record. Active gauges allow the management point to be used for monitoring flow impacts resulting from any management actions taken. Long periods of record allow a more reliable statistical basis for making management decisions. It may still be useful to locate management points where no stream flow gauging data exists because of other important factors as described below. In these cases, it is prudent to install stream flow gauges at these locations for future application. Note, that several stream flow gauges have recently (~2003) been installed in several locations in the WRIA 35 watershed.

- **Priority habitat for aquatic species.** Flow is often a key limiting factor for aquatic habitat. In WRIA 35 steelhead, Chinook, and bull trout are the most critical aquatic species. The presence (distribution and timing) of these fish play an important role in selecting a management point location. The presence of these fish in a stream reach acts as an instream water demand. For the purposes of this assessment, the Lower Snake River, Asotin, and Tucannon River Subbasin Plans (2004) prepared for the Northwest Power Planning Council are used as the basis for identifying the habitat restoration and protection priorities in the watershed.

- **Instream flow studies.** Instream flow studies provide a quantitative or semi-quantitative means to estimate instream flow needs based on aquatic habitat needs. Various instream flow studies have been, and are being, conducted in WRIA 35. These studies consist primarily of Instream Flow Incremental Methodology (IFIM) studies. IFIM is a series of computer-based models that consider habitat preferences including flow, velocity, and gravel (substrate) for different species and lifestages of fish. It shows how changes in available habitat will result from increases or decreases in stream flow. IFIM is discussed further in the subsequent Technical Memorandum No. 2. Other instream flow study options may also be considered, e.g. the toe-width method.

- **Drainage with significant water use.** The quantity of current and projected out-of-stream needs including upstream surface water diversions and/or groundwater withdrawals affect downstream surface flows. Water rights can be used to estimate demand when actual water use data is not available. However, there is great uncertainty in using this approach. Review

of water rights for this purpose is used simply as a "screening tool" to identify reaches with potentially higher water use. Additional on-the-ground surveys are needed to reconcile the better water use estimates. Since there are no areas with intense water use in WRIA 35, prioritization of the management points based on water demand is done on a relative basis.

- **Existing stream flow management.** In the process of reviewing water rights applications, Ecology is required to consult with WDFW on any potential impacts that a water right may have on instream flows. Through this process Ecology develops administrative requirements such as low flow restrictions and closures on surface water sources. Streams with these administrative requirements are candidates for review and integration with the overall stream flow management framework. To date minimum instream flows have not been formally adopted into rule for WRIA 35.

Table A-1
Proposed Management Points and Flow Related Issues

MP	Management Issues	Advantages	Disadvantages
1 Tucannon River at Smith Hollow	▪ Almost the entire length of the Tucannon River has been identified as a priority restoration area. ▪ Flow has been identified as a habitat limiting factor in the lower and middle portion of Tucannon River (Pataha to Hatchery). ▪ EDT indicates that flashy flow and high flows have a greater affect on fish production than low flow in this reach. ▪ Out-of-stream water demands from irrigation.	▪ Corresponds with location of IFIM study. ▪ Active USGS gauge at the location. ▪ Flow management point for entire Tucannon and Pataha subbasins.	▪ Another upstream MP may be needed since land use and water use characteristics are different in the upper Tucannon River.
2 Pataha Creek at Mouth	▪ Pataha Creek has not been identified as a priority protection/restoration area, though steelhead and possibly bull trout occur in the basin. ▪ Contributes flow to Tucannon, but its confluence is lower in the Tucannon River and improved or protected flows would not benefit most of the length of the Tucannon River. ▪ *Relatively*, significant surface and ground water rights (usage) in the Pataha Subbasin. ▪ A surface water source limitation has been defined for Pataha Creek ▪ Water demands from Pomeroy and irrigation.	▪ Flow management point for entire Pataha Subbasin. ▪ Active Ecology gauge at the location. ▪ Monitor contribution from Pataha into Tucannon.	▪ Currently limited flow data available.
3 Tucannon River at Marengo	▪ See MP-1, also. ▪ A surface water source limitation has been defined for Tucannon River. ▪ Different landscape features in the upper portion of the Tucannon River watershed (steeper slopes, different land uses).	▪ Corresponds with location of IFIM study. ▪ Active Ecology gauge at the location. ▪ Splits Tucannon to monitor upper portion which has different land use and water use characteristics.	▪ Currently limited flow data available.
4 Pataha Creek at Pomeroy	▪ See MP-2, also. ▪ Monitor impacts to flow from Pomeroy and surrounding area water use. ▪ Different landscape features in the upper portion of the Tucannon River watershed (steeper slopes, different land uses).	▪ Splits Pataha to monitor upper portion which has different land use and water use characteristics. ▪ Ecology manual stage height gauge available.	▪ Currently limited flow data available. ▪ Manual stage height gauge will not allow easy flow data collection in the future.

Table A-1
Proposed Management Points and Flow Related Issues

MP	Management Issues	Advantages	Disadvantages
5 Meadow Creek at Mouth	▪ A surface water source limitation has been defined for S. Meadow Creek. ▪ S. Meadow Creek has not been identified as a priority protection/restoration area. ▪ Limited out-of-stream use on this reach.	▪ Flow management point for entire South Meadow Creek drainage. ▪ Several stream flow gauges located on this reach	▪ Only a manual stage height gauge is currently available. ▪ Currently limited flow data available (new gauge or peak data only).
6 Deadman Creek at Mouth	▪ Almost the entire length of Deadman Creek has been identified as a priority restoration area. ▪ Limited out-of-stream use on this reach; some relatively large ground water users near the mouth. ▪ Flow has been identified as a key habitat limiting factor for this reach. ▪ Closure has been defined for Deadman Creek by adjudication.	▪ Active Ecology gauge at the location ▪ Flow management point for entire Deadman Creek drainage.	▪ Currently limited flow data available.
7 Deadman Creek below Forks	▪ See MP-6.	▪ Active Ecology gauge at the location. ▪ Splits Deadman Creek to monitor upper portion.	▪ Currently limited flow data available. ▪ Upper reach is not significantly different in character than lower reach.
8 Penawawa Creek at Mouth	▪ EDT analysis was not conducted specifically for this reach; however, Subbasin Plan assumed that conditions are similar to Almota and Deadman Creeks. ▪ Included as priority because of high density of juvenile steelhead. ▪ Flow has been identified as a key habitat limiting factor for this reach. ▪ Limited to no out-of-stream use on this reach. ▪ A surface water source limitation has been rescinded for Penawawa Creek.	▪ Ecology manual stage height gauge available. ▪ Flow management point for entire Penawawa Creek drainage.	▪ Only a manual stage height gauge is available. ▪ Currently limited flow data available.

Table A-1
Proposed Management Points and Flow Related Issues

MP	Management Issues	Advantages	Disadvantages
9 Little Almota Creek at Mouth	▪ Little Almota Creek has been identified as a priority protection/restoration area. ▪ Flow has been identified as a key habitat limiting factor for this reach. ▪ Limited out-of-stream use on this reach.	▪ Active Ecology gauge at the location. Flow management point for entire Little Almota Creek drainage.	Currently limited flow data available.
10 Alkali Flat Creek at mouth	▪ A surface water source limitation has been defined for Alkali Flat Creek. ▪ Not identified as a priority protection or restoration area. ▪ Several diversions and withdrawals occur in the middle and upper portion of drainage area.	▪ Main tributary to Snake River in the northern portion of the Middle Snake Subbasin.	▪ No stream flow data or gauge currently available.
11 Alpowa Creek at Mouth	▪ See MP-8, also. ▪ Several tributaries exist in this drainage area which may require reach-specific management. ▪ Flow has not been identified as a key habitat limiting factor for this reach. ▪ A surface water source limitation has been defined for Alpowa Creek. ▪ Most large surface and ground water users are near the mouth.	▪ Active Ecology gauge at the location ▪ Flow management point for entire Alpowa Creek drainage.	▪ Currently limited flow data available.
12 Asotin Creek at Mouth	▪ Flow has not been identified as a key habitat limiting factor for this reach (exception of lower George Creek). ▪ A surface water source limitation has been defined for Asotin Creek. ▪ Series of diversions occur in the lower Asotin Creek. ▪ All three priority species utilize this basin.	▪ Corresponds with location of IFIM study. ▪ Historical USGS gauge at the location. ▪ Flow management point for entire Asotin Creek drainage.	▪ May move this MP up above the confluence of George Cr. even though the IFIM study is lower.

Table A-1
Proposed Management Points and Flow Related Issues

MP	Management Issues	Advantages	Disadvantages
13 George Creek above Asotin Cr.	▪ Flow has been identified as a key habitat limiting factor in lower George Creek. ▪ Almost the entire length of George Creek has been identified as a priority restoration area. ▪ Some diversions and withdrawals are present in the upper watershed.	▪ Flow management point for entire George Creek drainage, which includes numerous small tributaries.	▪ Currently limited flow data available.
14 Asotin Cr. below George Cr.	▪ Flow has not been identified as a key habitat limiting factor for this reach. ▪ Almost the entire length of Asotin Creek has been identified as a priority restoration area. ▪ A surface water source limitation has been defined for Asotin Creek (Palmer and Kearney Gulch) which needs to be confirmed. ▪ Limited to no out-of-stream use on this reach.	▪ Monitor upper tributaries including Charley Creek.	▪ Currently limited flow data available.
15 Tenmile Creek at Mouth	▪ Flow has not been identified as a key habitat limiting factor for this reach. ▪ Tenmile in its entirety is flow limited; however it is not known how much land cover change has affected ground water infusion in this steep watershed. ▪ Limited to no out-of-stream use on this reach. ▪ Steelhead are known to spawn in this stream.	▪ Ecology manual stage height gauge available. ▪ Flow management point for entire Tenmile Creek drainage.	▪ Only a manual stage height gauge is available. ▪ Currently limited flow data available.
16 Couse Creek at Mouth	▪ See MP-15. ▪ EDT was not conducted for Couse Creek, but results for Tenmile can generally be applied.	▪ Ecology manual stage height gauge available. Flow management point for entire Couse Creek drainage.	▪ Only a manual stage height gauge is available. ▪ Currently limited flow data available.

Table A-1
Proposed Management Points and Flow Related Issues

MP	Management Issues	Advantages	Disadvantages
17 Grande Ronde R. at mouth	▪ This management point is a "place holder" for stream flow management in the Grande Ronde Subbasin. This implementation area is currently undergoing its Level 1 Assessment. ▪ Steelhead utilize several tributaries within the WA portion of the basin for spawning and rearing. Chinook and bull trout migrate to areas upstream in OR.	▪ TBD	▪ TBD

Table A-2
Summary Data by Management Point - WRIA 35

I	II	III	IV	V	VI	VII	VIII	IX	X	XI
MP	Location	Gauge ID	Subbasin	Priority Protection (Upper/Lower Extent)	Priority Restoration (Upper/Lower Extent)	Known/Presumed Focal Fish Distribution	Other MPs that affect or are affected by flows at this point.	Existing Stream Closure	Relevant SWSLs	IFIM
1	Tucannon River below Smith Hollow	USGS 13344500: Daily realtime data, 1914-1917, 1928-1931, 1958-1990, 1994-present	Tucannon	NA	Tucannon River: from confluence with Smith Hollow to Marengo including the lower portion of Smith Hollow Creek.	Tucannon River: from confluence with Smith Hollow to Marengo including the lower portion of Smith Hollow Creek.	MP-2 (upstream), MP-3 (upstream) MP-4 (upstream)	NA	NA	NA
2	Pataha Creek at mouth	WDOE 35F050: Telemetry, June 2003 to present	Pataha	NA	NA	Pataha Creek: from mouth upstream to approximately Bihmaier Gulch.	MP-1 (downstream) MP-4 (upstream)	NA	Pataha Creek: T11N, R41E, Sec. 4 (at mouth). Low flow 10 cfs	
3	Tucannon River at Marengo	WDOE 35B150: Telemetry, June 2003 to present	Tucannon	Lower reaches of Panjab and Cummins Creeks.	Tucannon River: from Marengo upstream to Bear Creek.	Tucannon River: from Marengo upstream to Bear Creek including the lower reaches of Sheep, Bear, Cold, Turkey, Tumalum, and Meadow Creeks , as well as the lower reaches of the Little Tucannon River.	MP-1 (downstream)	NA	Tucannon River: T10N, R41E, Sec. 22 (near confluence with Cummins Creek). Closure - 1974. Tucannon River: T12N, R39E, Sec. 33 (upstream of Willow Creek). Low flow 50 cfs.	
4	Pataha Creek at Pataha	WDOE 35F100: Manual Stage Height, June 2003 to present, 15 records	Pataha	NA	NA	Pataha Creek: from below confluence with Bihmaier Gulch upstream to approximately the Umatilla NFS Bounds including the lower portion of Bihmaier Gulch Creek.	MP-1 (downstream) MP-2 (downs tream)	NA	Pataha Creek: T11N, R41E, Sec. 4 (at mouth). Low flow 10 cfs	
5	Meadow Creek at mouth	WDOE 35N050: Manual Stage Height, June 2003 to present, 16 records	Middle Snake River Mainstem	NA	NA	Meadow Creek mainstem from mouth upstream including the lower reaches of North and South Meadow Creeks.	NA	NA	Meadow Creek: T13N, R40E, Sec. 15 (near mouth). Adjudication 1929. South Meadow Creek: T12N, R43E, Sec. 29. Bypass flow for stock watering.	
6	Deadman Creek at mouth	WDOE35M060: Telemetry, June 2003 to present	Middle Snake River Mainstem	NA	Deadman Creek mainstem from Ping Gulch upstream to Lynn Gulch.	Deadman Creek mainstem from mouth upstream to just above Lynn Gulch.	MP-7 (upstream)	NA	Deadman Creek: T13N, R40E, Sec. 9 (near mouth). Adjudication 1922.	
7	Deadman Creek below Forks	WDOE 35M100: Telemetry, June 2003 to present	Middle Snake River Mainstem	NA	Deadman Creek mainstem from Lynn Gulch upstream to forks including the lower reaches of South Deadman Creek.	Deadman Creek mainstem from Lynn Gulch upstream to forks including the lower reaches of South and North Deadman Creeks.	MP-6 (downstream)	NA	Deadman Creek: T13N, R40E, Sec. 9 (near mouth). Adjudication 1922.	

Table A-2
Summary Data by Management Point - WRIA 35

I	II	III	IV	V	VI	VII	VIII	IX	X	XI
MP	Location	Gauge ID	Subbasin	Priority Protection (Upper/Lower Extent)	Priority Restoration (Upper/Lower Extent)	Known/Presumed Focal Fish Distribution	Other MPs that affect or are affected by flows at this point.	Existing Stream Closure	Relevant SWSLs	IFIM
8	Penawawa Creek at mouth	WDOE - Proposed: Manual Stage Height	Middle Snake River Mainstem	NA	Penewawa Creek: from Rock Spring Canyon to forks including the lower reaches of Goose Creek.	Penewawa Creek: from mouth to forks including the lower reaches of Little Penewawa and Goose Creeks.	NA	NA	Penewawa Creek: T14N, R41E, Sec. 17 (at mouth). Earlier closure recinded as of 1963.	
9	Little Almota Creek at mouth	WDOE 35L050: Telemetry, June 2003 to present	Middle Snake River Mainstem	NA	NA	Little Almota Creek: from mouth to headwaters	NA	NA	NA	
10	Alkali Flat Creek at mouth	None	Middle Snake River Mainstem	NA	NA	Pah Wah Kee Gluch	NA	NA	Alkali Flat Cr: T13N, R38E, S08. 0.05 cfs	
11	Alpoa Creek at mouth	WDOE 35K050: Telemetry, Juen 2003 to present	Lower Snake River Mainstem	NA	NA	NA	NA	NA	Alpoa Creek: T11N, R45E, Sec. 19. Adjudicated Closure 1923.	
12	Asotin Creek at mouth	USGS 13335050: Daily realtime data, 1991-2002	Asotin	NA	Asotin Creek mainstem: from above George Creek upstream to just above Charlie Creek.	Asotin Creek mainstem: from mouth upstream to just above Charlie Creek.	MP-12 (upstream) MP-13 (upstream) MP-14 (upstream)	NA	Asotin Creek: T10N, R46E, Sec. 16 (mouth). 15 cfs from Apr. 1 to June 30.	
13	George Creek above Asotin Creek	WDOE - No Gauge Here	Asotin	George Creek mainstem: from Wormell Gulch upstream to headwaters.	George Creek mainstem: from mouth upstream to Wormell Gulch.	George Creek mainstem: from mouth to headwaters including the lower reaches of Wormell Gulch, Hefflefinger Gulch, and Coombs Canyon. Pintler Creek mainstem: from mouth to headwaters including the lower reaches of Ayers Gulch, Kelly Creek, and Nims Gulch.	MP-11 (downstream)	NA	NA	
14	Asotin Creek above George Cr.	USGS 13334700, Daily, 1959-1982, 1989-1996	Asotin	NA North Fork Asotin Creek: from confluence with George Creek upstream	Charlie Creek: North Fk and South Fk Asotin Creek.	Asotin Crek and all upstream tributaries including Charley Cr, North Fk, South Fk, and headwaters	MP-12 (downstream)	NA	Asotin Creek: T10N, R45E, Sec. 19 (between Palmer and Kearnery Gulches). Low flow 10 cfs	
15	Tenmile Creek at mouth	WDOE 35J050: Manual Stage Height, June 2003 to present, 16 records	Asotin	Tenmile Creek mainstem: from mouth upstream to Mill Creek.	NA	Tenmile Creek mainstem and all tributaries to headwaters	NA	NA	NA	
16	Couse Creek at mouth	WDOE 35H050: Manual Stage Height, June 2003 to present, 15 records	Asotin	NA	NA	Couse Creek upstream to Matheny gulch	NA	NA	NA	
17	Grande Ronde R. 2 mouth	**USGS 13334000, Daily, 1909-1911**	Grand Ronde	TBD	TBD	TBD	TBD			

Table A-2 Summary Data by Management Point - WRIA 35										
I	II	III	IV	V	VI	VII	VIII	IX	X	XI
MP	Location	Gauge ID	Subbasin	Priority Protection (Upper/Lower Extent)	Priority Restoration (Upper/Lower Extent)	Known/Presumed Focal Fish Distribution	Other MPs that affect or are affected by flows at this point.	Existing Stream Closure	Relevant SWSLs	IFIM
Notes: SWLS on Alkalai Flat Creek "low flow 0.05 cfs" but no associated MP. SWSL on Wawawai Canyon but no associate MP.										

Table A-3 Overview of Potential Water Use and Land Use Management Techniques for Stream Flow Management	
Technique	**Description**
Water Use Management Options	
Restrictions on issuance of new water rights	The Department of Ecology could adopt State Rules (WACs) to restrict issuance of new water rights in WRIA 35. In all affected streams reaches a closure could be established, but with certain exceptions. Existing water rights would not be affected by this policy.
	The rules adopted may be developed such that issuance of water rights for selected purposes and conditions would not be prevented. These include: ▪ New uses for domestic wells, based on the amount of the water required to meet estimated needs. ▪ New uses for small community systems and other beneficial uses, up to a predefined, limited "block" of water. Access to this block could be granted only after consideration of items as listed for municipal systems, below. ▪ New uses for municipal water systems, based on the amount of water required to meet estimated needs. ▪ Small, temporary uses of water for environmental restoration purposes not exceeding one year in duration. ▪ Non-consumptive uses such as fish propagation or hydropower. ▪ New uses limited to the high flow season, where the nature of the proposed use is such that water will not be taken in the low-flow season. However, this would not be intended to allow withdrawals large enough to compromise habitat-forming processes of any stream. *Note: quantities of "blocks" of water would represent the net depletion of stream flow in each subbasin. Furthermore, public water systems' access to the block may be granted only after predefined conditions are met (e.g. water efficiency measures or mitigation).*
	The Planning Unit could recommend that minimum instream flows be adopted as an additional element of the State Rules in selected subbasins where sufficient data is available. The minimum instream flows would be used in processing applications for changes or transfers of existing water rights. However, the blocks of water reserved for domestic, municipal, and other beneficial uses (see above) would not be subject to minimum instream flow conditions.
	The rule could be evaluated after a predefined period after adoption. Revisions to the rule could be considered if needed, including increases to water supply block reservations, shifting water reservation quantities among water use categories to better address actual needs

Table A-3 Overview of Potential Stream Flow Management Techniques for WRIA 35	
Technique	**Description**
Water Conservation*	Water conservation could be considered part of a sound comprehensive water resources management program.
	Consider adherence to State requirements for municipal water conservation, as modified from time to time, to be sufficient for all communities in WRIA 35.
	Conservation activities that exceed state requirements could be carried out in selected communities where water use has the potential to cause significant impairment of stream flow conditions.
	Water conservation actions by farmers practicing irrigated agriculture may be warranted in selected locations, where there would be significant benefits to stream flows. The Conservation District in each County could provide technical assistance to farmers to identify water conservation opportunities and funding sources.
Short Term Drought Response*	Where surface water diversions or ground water withdrawals may (or are known to) have a direct effect on stream flows on a time scale of weeks or less, the water user could consider adopting voluntary procedures to alter operations in the event of a State-declared drought emergency affecting WRIA 35. The water user could adopt policies and procedures in advance, to allow for quickly altering operations to minimize or eliminate the depletion of stream flow to the extent feasible in the event such a drought occurs.
	For hydropower operations it is assumed that FERC license conditions fully address releases under low flow conditions, including drought conditions.
	Efforts could continue to identify small surface water users that could implement this type of management strategy to improve low flow conditions.
Source Substitution	Communities using water sources (surface or ground water) that may (or are known to) significantly reduce base flows in any stream that provides important fish habitat within WRIA 35 could consider alternative sources of supply that eliminate or minimize these effects. It is anticipated that this would require examination of cost, potential rate impacts, reliability considerations, and evaluation of other feasibility criteria.
	In limited cases, this option may apply to rural areas where residents rely on domestic wells (exempt wells). Counties could assess this possibility through a water-balance analysis, in selected rural areas where extensive new development may expected to occur or where there is substantial existing development served by exempt wells. The intent is to explore solutions for small creeks where a large number of existing domestic wells may deplete stream flows. Under the right circumstances, if a different source could be used to replace individual wells, effects on stream flow could potentially be reduced or eliminated. Local community views would be included in this process.
Storage Projects	The Planning Unit is currently investigating the feasibility of developing storage projects in the basin. Potential alternatives include shallow aquifer recharge, aquifer storage and recovery, off-stream storage, and others. Based on the recommendations from the Level 2 Water Storage Assessment, further implementation recommendations can be developed.
Transfer of Water Rights to State Trust	Ecology could use its existing State Trust program, and funding provided by the State Legislature, to identify and acquire water rights from water users willing to sell or donate their water rights in WRIA 35, where transfers to the State Trust would provide a significant benefit to fish habitat.

Table A-3 Overview of Potential Stream Flow Management Techniques for WRIA 35 (cont'd)	
Technique	**Description**
Enforcement Against Unauthorized Uses	Ecology could conduct or support initial surveys in selected subbasins to determine whether unauthorized water uses are occurring on streams deemed critical to salmon recovery within WRIA 35. If these surveys identify extensive unauthorized uses, they could be expanded to additional subbasins and carried out on a regular, periodic basis (e.g. once every five years). Where unauthorized uses are identified, Ecology could take enforcement actions to eliminate these uses.
	An alternative or additional approach would be to establish a watermaster that has regulatory authority to regulate illegal water diversions.
Hydropower Operations	The Planning Unit could rely on the FERC licensing process to provide protections for flow and other habitat factors associated with hydroelectric facilities on the Snake River.
Land Use Management Options	
Forest Practices	The USFS, State DNR and private landowners could consider effects of forest management practices on stream flow and other fish habitat factors, in making forest management decisions. Existing programs under the State's Forests and Fish regulations, DNR's Habitat Conservation Plan, and the federal government's Northwest Forest Plan would provide the regulatory framework needed in this regard. The State and federal governments would monitor the effectiveness of these programs and periodically provide public documentation of their effectiveness in protecting stream flows in WRIA 35.
Agriculture Practices*	The most significant benefits to stream flow from agricultural practices are derived from implementation of irrigation efficiencies, which is part of "water conservation" described above. However, agricultural practices related to land use can also improve stream flows by maintaining field practices to maximize infiltration, e.g. maintaining riparian and wetland areas where possible.
Stormwater Management	Communities could review their stormwater management ordinances (or develop ordinances) to determine whether they are adequately protective of flow quantities and fish habitat in local streams that may be affected by future development. Where enhanced stormwater management needs are identified, revisions to local ordinances could be considered in light of the guidance and BMPs provided in Ecology's Manual. The focus would be on upgrading development practices and mitigation requirements in areas where stream flow and fish habitat may be compromised as development occurs. Costs, expected magnitude of benefits, and feasibility considerations should be included in this review.
Floodplain Management	Local jurisdictions and state agencies with land management responsibilities could protect existing floodplains from modifications that would impair their hydrologic functions and habitat value.
	Local jurisdictions and state agencies with land management responsibilities could identify floodplain restoration projects, subject to local input, cost-benefit analysis, and availability of funding. Where these factors are favorable, and where substantial benefits to flow or other habitat factors are identified, these projects could be pursued for implementation. This work could be integrated with the Subbasin Planning and Salmon Recovery Planning efforts.
Wetlands Management	Counties could assess the hydrologic function of wetlands as a part of their wetlands inventory. Their wetlands ordinances could be modified as needed to include hydrologic functions in the wetland protection hierarchy.
	Counties could review and consider strengthening mitigation ratios, for selected wetland areas that offer significant hydrologic functions or other fish habitat benefits.

**This would be a Planning Unit recommendation for voluntary actions. Implementation would not be mandated by the State.*

Table A-4
WRIA 35 Stream Flow Gauge Identification Matrix

Gauge No	Subbasin	Agency	Gauge ID	Location	Data Type	Period of Record
1	Asotin	USGS	13334700	Asotin Creek below Kearney Grade	Daily Streamflow	1959-1982; 1989-1996
2	Asotin	USGS	13334450	Asotin Creek at NF/SF Confluence	Daily Streamflow	2001-Present
3	Asotin	USGS	13334500	Asotin Creek near Asotin	Daily Streamflow	1928-1959
4	Asotin	USGS	13335050	Asotin Creek at Asotin	Daily Streamflow	1988-1989; 1991-2002
5	Asotin	USGS	13334400	Mill Creek at Anatone	Peakflow	1971-1977
6	Asotin	USGS	13334900	Pintler Creek near Anatone	Peakflow	1971-1977
7	Asotin	Ecology	35H050	Couse Creek at Mouth	Manual Stage Height	June 2003-Present
8	Asotin	Ecology	35J050	Tenmile Creek at Mouth	Manual Stage Height	June 2003-Present
9	Grande Ronde	USGS	13334000	Grande Ronde River at Zindel, WA	Daily Streamflow	1909-1911
10	*Grande Ronde (oregon)*	*USGS*	*13333300*	*Grande Ronde River at Troy, WA (not on map)*	*Daily Streamflow*	*1944-2001*
11	Grande Ronde	Ecology	35G060	Joseph Creek Near Mouth	Telemetry	June 03-Present
12	Lower Snake Mainstem	WSU	Lower Deadma	Lower Deaman Creek at Wilson's Banner Ranch	Spot Flow Data	2003
13	Lower Snake Mainstem	WSU	Upper Deadmar	Upper Deadman Creek at Gould City, Downstream of North-South Fork Confluence	Spot Flow Data	2003
14	Lower Snake Mainstem	WSU	Lower Meadow	Meadow Creek near SR 127-Meadow Creek Road Intersection.	Spot Flow Data	2003
15	Lower Snake Mainstem	WSU	Upper Meadow	Meadow Creek at Ben Day Gulch Bridge	Spot Flow Data	2003
16	Lower Snake Mainstem	WSU	Alpowa	Alpoa Creek at Wilson's Banner Ranch	Spot Flow Data	2003
17	Lower Snake Mainstem	USGS	13334300	Snake River near Anatone	Real-Time	1959-2002; 1992-Present
18	Lower Snake Mainstem	USGS	13343500	Snake River near Clarkston	Daily Streamflow	1915-1973
19	Lower Snake Mainstem	USGS	13343510	Alpowa Creek at Peola	Peakflow	1971-1977
20	*Lower Snake Mainstem*	*USGS*	*13343590*	*Forebay of Lower Granite Dam (Lower Granite Lake)*	*Real-Time*	*NO DATA*
21	*Lower Snake Mainstem*	*USGS*	*13343595*	*Snake River below Lower Granite Dam (right bank)*	*Real-Time*	*NO DATA*
22	Lower Snake Mainstem	USGS	13343600	Snake River below Lower Granite Dam (left bank)	Daily Streamflow	1978-1985
23	Lower Snake Mainstem	USGS	13343620	South Fork of Deadman Creek, Tributary near Pataha	Peakflow	1961-1976
24	*Lower Snake Mainstem*	*USGS*	*13343855*	*Forebay of Little Goose Dam (Lake Bryan)*	*Real-Time*	*NO DATA*
25	*Lower Snake Mainstem*	*USGS*	*13343860*	*Snake River below Little Goose Dam*	*Real-Time*	*NO DATA*
26	Lower Snake Mainstem	Ecology	35K050	Alpowa Creek at Mouth	Telemetry	June 03-Present

Table A-4 WRIA 35 Stream Flow Gauge Identification Matrix						
27	Lower Snake Mainstem	Ecology	35L050	Almota Creek at Mouth	Telemetry	June 03-Present
28	Lower Snake Mainstem	Ecology	35M060	Deadman Creek near Mouth	Telemetry	June 03-Present
29	Lower Snake Mainstem	Ecology	35M100	Deadman Creek near Gould City	Telemetry	June 03-Present
30	Lower Snake Mainstem	Ecology	35N050	Meadow Creek at Mouth	Manual Stage Height	June 03-Present
31	Lower Snake Mainstem	USGS	13335200	Critchfield Draw near Clarkston	Peakflow	1959-1976
32	Lower Snake Mainstem	USGS	13343450	Dry Creek at Mouth	Peakflow	1963-1977
33	Lower Snake Mainstem	USGS	13343520	Clayton Gulch near Alpowa	Peakflow	1961-1976
34	Lower Snake Mainstem	USGS	13343660	Smith Gulch, Tributary near Pataha	Peakflow	1955-1974
35	Lower Snake Mainstem	USGS	13343700	Ben Day Gulch, Tributary near Pomeroy	Peakflow	1961-1969
36	Lower Snake Mainstem	USGS	13343790	Meadow Creek, Tributary near Central Ferry	Peakflow	1970-1977
37	Lower Snake Mainstem	USGS	13343800	Meadow Creek near Central Ferry	Daily Streamflow	1963-1974
38	Pataha	WSU	Pataha 1	Pataha Creek near Mouth	Spot Flow Data	1998-2001; 2003
39	Pataha	WSU	Pataha 3	Pataha Creek near Pomeroy	Spot Flow Data	1998-2001; 2003
40	Pataha	WSU	Pataha 5	Pataha Creek (headwater area)	Spot Flow Data	1998-2001; 2003
41	Pataha	Ecology	35F050	Pataha Creek near Mouth	Telemetry	June 03-Present
42	Pataha	Ecology	35F100	Pataha Creek near Pataha	Manual Stage Height	June 03-Present
43	Tucannon	WSU	TC6	Tucannon River at Cummings Creek Bridge (Spring Lake Campground)	Spot Flow Data	1999-2001
44	Tucannon	WSU	TC9	Tucannon River at Panjab Creek Bridge	Spot Flow Data	1999-2001
45	*Tucannon*	*WSU*	*TC4*	*Tucannon River at Marengo*	*Spot Flow Data*	*NOT IN LEVEL I*
46	Tucannon	USGS	13344500	Tucannon River near Starbuck	Daily Streamflow	1914-1917; 1928-1931; 1958-1990; 1994-Present
47	Tucannon	USGS	13344506	Kellog Creek, Tributary No. 2 near Starbuck	Peakflow	1970-1978
48	Tucannon	USGS	13344508	Kellog Creek, Tributary near Starbuck	Peakflow	1964-1969
49	Tucannon	USGS	13344510	Kellog Creek, Tributary at Starbuck	Peakflow	1963-1964
50	Tucannon	USGS	13344000	Tucannon River near Pomeroy	Daily Streamflow	1913-1930
51	Tucannon	Ecology	35B150	Tucannon River near Marengo	Telemetry	June 2003-Present