Response by Oregon Water Trust to
ISRP Preliminary Report
Project ID: 21019
Fifteenmile Subbasin Water Right Acquisition Program
Submitted 10/27/00

The ISRP requested more explicit information on monitoring and evaluation of OWT's water right acquisitions in the Fifteenmile Subbasin. This response addresses two aspects of monitoring and evaluation: first, evaluating ecological benefits resulting from water right acquisitions and second, stewardship activities to assure adequate measurement, monitoring and protection of instream water rights.

I. Evaluating Ecological Benefits Resulting from Water Right Acquisitions

A. Strategic Partnerships

Analysis of the ecological impacts of a water rights acquisition in the Fifteenmile Creek Subbasin will be accomplished not only through OWT efforts, but also through strategic partnerships between OWT and local individuals and state, federal and tribal agency staff. OWT will participate in these strategic partnerships to help ensure that ecological benefits in the Fifteenmile Creek Subbasin are monitored and evaluated, specifically assessment of improvements in overall habitat condition and changes in the physical condition of the system resulting from water remaining instream throughout the year.

Our primary strategic partnership for ecological assessment is with the Oregon Department of Fish and Wildlife. ODFW monitors the physical and biological response from BPA funded riparian and aquatic habitat restoration measures, as detailed in the attached letter of endorsement from James A. Newton, District Fish Biologist for ODFW. ***(Attachment 1)***

B. Indicators of Ecological Benefits

1. Overall Habitat Condition

The overall habitat condition is determined by factors such as (1) water quantity, including stream system flow parameters, (2) water quality, including stream temperatures, and (3) the condition of spawning, rearing and migration habitat. In evaluating the overall habitat condition, OWT will use the following biological parameters to determine the ecological impact of water right acquisitions

- Anadromous and resident species present in the system (based upon studies by ODFW and other interested individuals);
- Status of species present as sensitive or threatened;
- Use of the system in general, and the protected reach in particular, for migration, spawning, incubation, rearing and/or feeding (based upon studies by ODFW and other interested individuals);
- Assessment of whether increased water quantity has improved overall habitat condition (based upon analysis by relevant state, federal and tribal agency staff); and

- Assessment of ecological benefits of enhanced streamflows in conjunction with other habitat restoration activities (sponsored by local individuals, and state, federal and tribal agencies).

Each of these parameters relates to the biological health of the system and thus, to the overall habitat condition of that system. An analysis using these parameters is facilitated by studies of Fifteenmile Creek completed by ODFW biologists and tribal fisheries biologists. Further studies are planned, which will provide data by which OWT will be able to measure the effects of its efforts on fish populations and overall habitat conditions.

2. Physical Characteristics of the System

Evaluation of the benefits of water right acquisitions to the overall habitat condition of a stream system is apparent not only through analysis of the biological health of a system, but also through evaluation of the physical characteristics of that system. Physical improvements to a stream system provide a basis upon which the biological health of the system and the overall habitat condition can improve. OWT uses the following physical parameters to identify and analyze the conservation impact of each water right acquisition:

- Miles of stream, or the reach, for which the flow is protectible (generally from the previous point of diversion to the mouth of the stream);
- Relative priority date of the water right (senior rights transferred to instream use are protectible against junior rights in the defined reach, meaning that instream flows are more likely to be maintained during low flow periods);
- Rate of flow of water (cubic feet per second or gallons per minute) relative to existing flow conditions; and
- Period of use (often limited to the irrigation season).

C. Quantification of Impact of Enhanced Streamflows

Because there is no scientific methodology that quantifies a specific relationship between incremental streamflow enhancement and fish production, the focus of our analysis of ecological impact look at the relationship of streamflow to habitat criteria. First, looking at a particular water right or combined water rights on a creek, we calculate the instream water right as a percentage of effective flow. Second, looking at the total portfolio of instream water rights in a subbasin, we estimate the river miles protected in relation to the most productive habitat in the subbasin.

1. Instream Water Right as Percentage of Effective Flow

A strong indicator of the ecological significance of instream water rights is the OWT instream water right as a percentage of effective flow. Natural flow is how much water would be in the creek if no diversions were made. Consumptive use is the amount of water that can be diverted from the creek under existing water rights. Effective flow is the amount of water actually in the creek below the diversions, or the natural flow less the consumptive use. OWT's instream water right can then be compared to the effective flow to show how much water OWT has added. We have often used August flows to make these calculations, focusing on times when naturally low flows are exacerbated by irrigation withdrawals. Using this method, OWT's instream water rights

can be compared to the effective flow within Fifteenmile and Eightmile creeks to determine the percentage of water OWT added to the creek through its acquisition of water rights.

ODFW has done some work toward recommended targeted minimum flows in priority areas for flow restoration. An alternative indicator of ecological significance is the instream water right in comparison to these preliminary recommendations for minimum streamflow. The recommended minimum streamflow for Fifteenmile and Eightmile Creeks is 2 cfs. OWT's acquisitions to date of 1.5 cfs of senior rights on Fifteenmile Creek represent a significant portion of this recommended minimum, that provides some basis for quantifying the ecological significance of these enhanced flows.

2. River Miles with Enhanced Flow Related to Most Productive Habitat

In some of OWT's priority basins fish biologists have analyzed which stream systems and reaches appear to provide the most productive spawning and rearing habitat for listed anadromous fish. (Also, in evaluating potential acquisitions we include assessment of whether the stream is in a "core area" for coho and steelhead under the Oregon Plan for Salmon and Watershed, a "streamflow restoration priority area" as identified by the Oregon Department of Fish and Wildlife and Oregon Water Resources Department; a "key watershed" under the President's Forest Plan; and an "aquatic diversity area" as classified by the American Fisheries Society.) In areas where highly productive stream reaches and systems are identified, we can compare the river miles along which flows are enhanced by instream water rights with the locations of the most productive habitat, to provide an estimate of the impact of these water right acquisitions on the most productive habitat. We will continue discussions with ODFW and other strategic partners to determine whether there is sufficient information available to support this assessment in the Fifteenmile Creek Subbasin.

II. Stewardship Activities to Ensure Adequate Measuring, Monitoring and Protection

A. Strategic Partnerships

OWT's plan for measuring, monitoring and protecting instream water rights is based on strategic local partnerships. This plan involves working closely and cooperatively with the local watermaster to ensure accurate measurement and regulation of streamflows in the Fifteenmile Creek subbasin, and includes OWT staff touring on-the-ground with the watermaster to ensure adequate protections are in place. OWT foresees continued development and refinement of this plan, including seeking funds for additional technology for monitoring and the development of additional local partnerships.

Our primary strategic partner for measuring, monitoring and protection is with the Oregon Water Resources Department. OWRD protects instream rights, as detailed in the attached letter of endorsement from Larry Toll, District 3 Watermaster. ***(Attachment 2)***

B. Measuring and Monitoring Needs Assessments

At the beginning of each irrigation season, OWT develops a strategy for monitoring the instream flow with watermaster Larry Toll for all of OWT's Fifteenmile Creek instream water rights to ensure that those rights are enforced. OWT has mapped out the stream reaches covered by senior instream water rights, indicating the previous points of diversion and the cumulative effect of

multiple acquisitions along the same creek. ***(Attachment 3)*** OWT also maintains a database to track the exact amount and relative priority date of each acquisition. ***(Attachment 4)*** These provide a framework for conducting an annual measuring and monitoring needs assessment as we enter the irrigation season.

OWT developed such plans with Toll for the last several irrigation seasons. Toll maintains a minimum flow all summer to provide for "stock water needs" as per the Fifteenmile Creek decree. The total of all OWT's Fifteenmile Creek rights in 2001 will likely be greater than 5 cfs, including more than 2 cfs of senior rights. Thus, the plan will require that an additional increment of flow be protected up to the total senior instream water rights. In past years, the watermaster generally shut off all water rights junior in priority to the early 1900's in order to meet the instream rights.

In developing the annual measuring and monitoring needs assessment and plan, OWT staff considers a variety of monitoring strategies and water measurement devices. OWT and the local watermaster select the strategies best suited to the water right acquisition considering the resources are available**.** ***(Attachments 5 and 6)***

C. Site Visits During Irrigation Season Periods of Low Flow

A basic component of monitoring every instream water right is periodic site visits by OWT staff and the local watermaster to help implement the monitoring strategy and ensure protection of the instream rights. OWT visits Fifteenmile Creek with the watermaster at least once during the summer in order to ensure that the instream rights on the system are being satisfied per their priority date. During that visit, OWT assesses flow at the various points in the watershed, and may use a Marsh-McBirney current meter to obtain measurements if necessary. Where instream rights are not being met, OWT works with the watermaster to ensure enforcement and regulation of junior water rights so that the instream rights are protected throughout the designated reach. OWT staff visited Fifteenmile Creek with Larry Toll in the summer of 2000, viewing streamflows upstream and downstream of the City of Dufur to ensure that there was sufficient water instream to meet or exceed OWT's collective instream rights OWT will decide when (and how often) to visit Fifteenmile Creek during the upcoming irrigation season based on periodic flow reports from the watermaster. Flow will depend on the snow pack and the rate of melt in the upper watershed.

Attachments:

1 - James Newton, ODFW Endorsement Letter
2 - Larry Toll, OWRD Endorsement Letter
3 - OWT Acquisitions Map Fifteenmile Creek Subbasin
4 - OWT Acquisitions Chart Fifteenmile Creek Subbasin
5 - Monitoring Methods Summary for Newsletter
6 - Monitoring Methods Technical Background

October 22, 2000

Andrew Purkey
Oregon Water Trust

Portland, Oregon

Dear Andrew,

I am writing to express my support for the Oregon Water Trust FY 2001 Project Proposal (**Project number 21019**) for the Fifteenmile Creek subbasin. Your proposal is seeking funding to acquire two cfs of instream water rights in the Fifteenmile Creek drainage. This water would be acquired from willing water right holders and then converted to instream water rights. This project would directly compliment the stream habitat restoration work that the Department of Fish and Wildlife has been implementing in the subbasin for the past fifteen years.

The State of Oregon has established water rights for Fifteenmile, Eightmile, Ramsey and Fivemile creeks. Unfortunately these instream water rights have one of the most junior priority dates for any of the water rights in the subbasin. This means that these water rights are paper rights that generally are only in affect during the winter / early spring, high stream flow, months. We assume that stream corridor restoration measures implemented during the last fifteen years have contributed additional flow to the subbasin streams during periods of low stream flow. However, any improvements in stream flow during the traditional irrigation season are usually quickly diverted or withdrawn from the streams by senior consumptive water right holders. The only effective way to improve stream flow during the dry summer and fall months is to convert senior consumptive water rights to senior instream water rights.

Once a consumptive water right has been acquired and converted to an instream water right, the Oregon Water Resources Department (WRD) then holds that right in trust for the people of Oregon. Monitoring and maintenance of an instream water right then becomes one of the responsibilities of the local WRD water master. ODFW personnel also monitor stream flow at strategic sites in the Fifteenmile Creek subbasin throughout the year as part of our habitat restoration project monitoring and evaluation activities. If any irregularities in stream flow are noted we will work with the water master to discover and remedy the problem.

ODFW's objectives for the Fifteenmile Creek subbasin include: 1) restoration of the wild winter steelhead population; 2) protection of the other subbasin resident and anadromous fish, including Pacific lamprey: 3) protection and restoration of riparian and aquatic habitat: 4) maintaining or increasing wildlife species diversity: 5) increasing wildlife

habitat and 6) protection of sensitive or listed wildlife species. Increasing summer and fall stream flow is a prerequisite for achieving these objectives and critical to the success of several BPA-funded fish habitat restoration projects, including the following projects: 19930400, and 21001.

ODFW will continue to monitor the physical and biological response from BPA-funded riparian and aquatic habitat restoration measures. This monitoring includes: 1) estimating annual subbasin steelhead, spring Chinook salmon and coastal cutthroat smolt production, 2) annual steelhead spawning ground surveys for index stream reaches, 3) annual collection of photos at strategic photo-points to assess riparian vegetative recovery and stream channel response to protection from livestock, 4) collection of stream water temperatures throughout the year, and 5) monitoring stream flow.

I strongly endorse the Oregon Water Trust Project Proposal 21019. This project not only will help to insure that other habitat restoration measures succeed in the subbasin, but may well help to insure that the eastern most stocks of wild winter steelhead and coastal cutthroat trout survive and flourish. I sincerely appreciate Oregon Water Trust's commitment to contribute to the overall restoration of the subbasin and its biota.

Sincerely,

James A. Newton
District Fish Biologist
Oregon Department of Fish and Wildlife
The Dalles Field Office
3701 West 13th Street
The Dalles, Oregon 97058

Independent Scientific Review Committee
Northwest Power Planning Council
Attention: Kendra Phillips
Response to ISRP
851 SW 6th Avenue, Suite 1100
Portland, OR 97204

Dear ISRP Members:

On behalf of the Oregon Department of Water Resources Watermaster District 3, I would like to submit this letter of endorsement for the Oregon Water Trust's Fifteenmile Subbasin Water Right Acquisition Program, Project ID 21019. Under this Program, OWT is working to acquire additional water rights in the Fifteenmile Subbasin for transfer to instream use. I understand that the ISRP has requested more detailed information on how monitoring and evaluation will be provided for these water right acquisitions, in order to assure that the acquired water is left instream and benefits fish habitat.

OWRD regularly monitors streamflows, sometimes two or three times per week, in both Fifteenmile Creek and Eightmile Creeks, the two primary streams in the Fifteenmile Subbasin. There are currently no stream gages in the Fifteenmile Creek Basin although budget requests have been made for gages. There are bridges over Fifteenmile and Eightmile Creeks near RM 2.75 of Fifteenmile Creek. These bridges provide easy viewing points for checking on stream flow, which can be checked by actual stream flow measurement as needed. Downstream of this point, there is very little use of water and Fifteenmile Creek is spring fed ensuring instream flows continue from this point to the confluence of Fifteenmile Creek with the Columbia River.

OWRD and OWT staff jointly developed a monitoring plan for Fifteenmile Creek in 1998, and in 1999 and 2000 jointly observed streamflows in the Fifteenmile Subbasin to help assure that water rights including those transferred to instream use by OWT are being satisfied. In a typical year, OWRD regulates back to water rights with priority dates in the 1920's, and in an especially dry year we may need to regulate back to 1870’s to 1880’s to assure that the most senior rights on the creek, some of which are held instream by OWT, are satisfied.

The measuring and monitoring plan for Fifteenmile Creek notes that "Watermaster maintains a flow for stock water needs as per the decree, and that water rights senior to the early 1900's are usually fully protectible throughout the irrigation season." The instream water rights with senior priority dates total 1.55 cfs, and the plan calls for 1) the watermaster to shut off water rights junior to the instream rights as needed, and 2) the watermaster and OWT staff to visit the creek to confirm the plan and to ensure that 1.55 cfs flows in the creek. As noted in OWT's monitoring plan for Fifteenmile Creek submitted to BPA in April 2000, the frequency of OWT visits to the Fifteenmile Creek system is based on periodic

flow reports from the watermaster. Flows depend on snow pack, and the rate of melt off in the upper watershed. Fewer visits may be needed when flows are high, and more visits when flows are low.

OWRD and OWT are working together to ensure that instream water rights with senior priority dates are satisfied in times of low flow in the Fifteenmile Subbasin. OWRD and OWT have worked jointly in other subbasins to obtain more sophisticated flow measurement equipment, such as the gaging station installed on Squaw Creek in the Deschutes Subbasin, and we are interested in continuing such cooperative efforts in the Fifteenmile Subbasin as well. While OWRD has the legal responsibility to protect senior water rights whether they are instream or out of stream uses, we welcome the opportunity to partner with OWT. Please do not hesitate to contact me if you would like additional information about OWRD's activities related to instream flows in the Fifteenmile Subbasin.

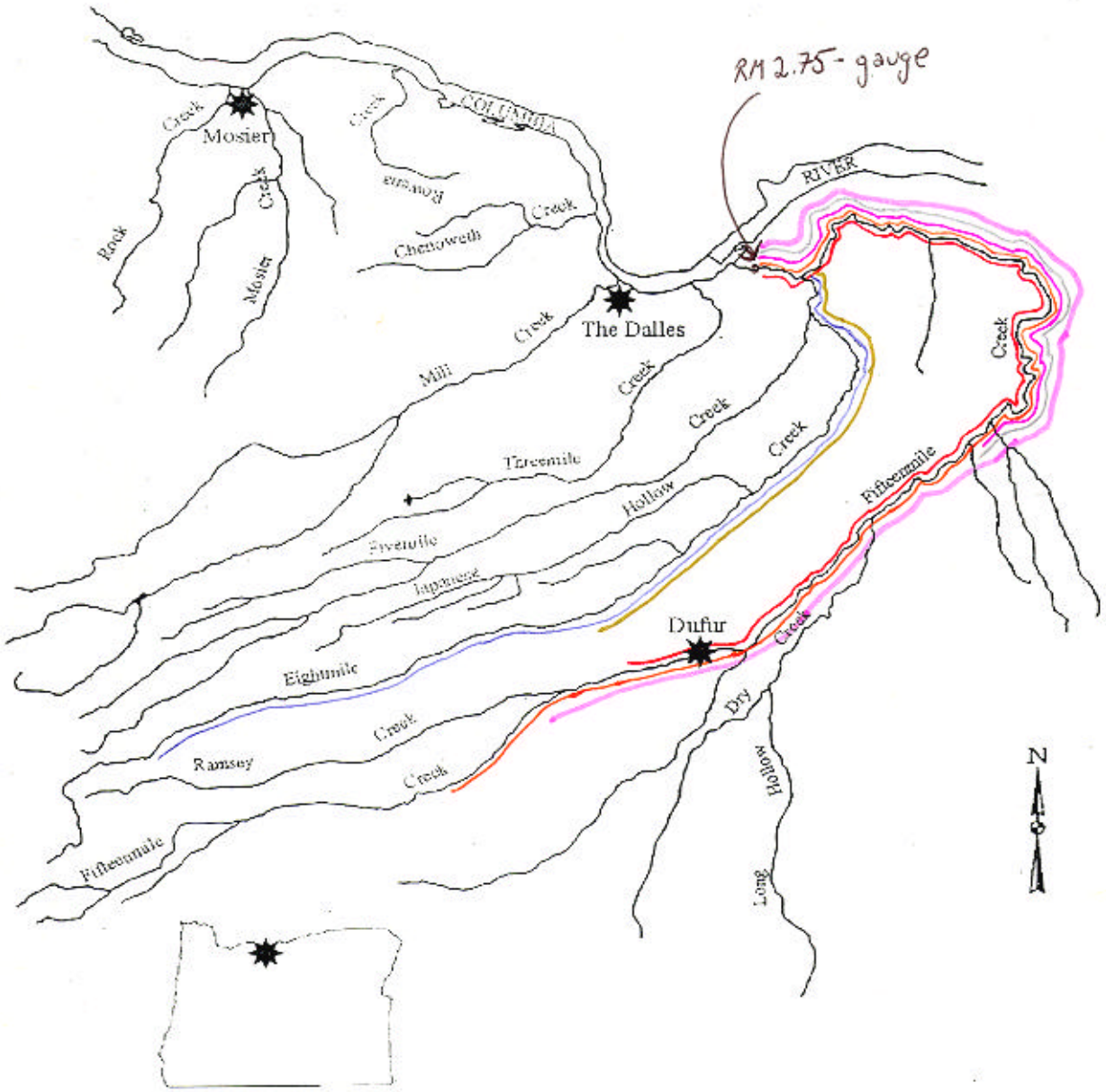
Sincerely,

Larry Toll, Watermaster
OWRD District 3

Oregon Water Trust

Fifteen Mile Creek Sub Basin

Water Right Acquisitions



KEY

Eightmile Creek

- Miller (1.017 cfs)
- Davis (P) (0.184 cfs)

Fifteenmile Creek

- City of Dufur (1.55 cfs)
- Eddins (0.52 cfs)
- Underhill (0.71 cfs)
- Kelly (P) (0.3 cfs)
- Thomas/Wilson (0.257 cfs) (P)

(P) = Permanent

Figure 1. Fifteenmile Creek Subbasin and the small tributaries to the Columbia River between Hood River and The Dalles, Oregon

9/14/00

Fifteenmile Creek

Project Name	Contract Type	Rate	Priority Date	Duty	Acres	Location	Species	Discussion	Monitoring Needs
Underhill	Donated Lease	0.10	1885	24.00	8.00	RM 33 to 2.75	steelhead		
Underhill	Donated Lease	0.23	1885,1856	55.80	18.60	RM 33 to 2.75	steelhead		
Underhill	Donated Lease	0.28	1964	66.90	22.30	RM 33 to 2.75	steelhead		
Underhill	Donated Lease	0.07	1976	17.70	5.90	RM 33 to 2.75	steelhead		
Underhill	Donated Lease	0.48	1977		39.10	RM 33 to 2.75	steelhead		
Kelly	Paid Permanent	0.30	1880		27.23	RM 21 to 2.75	steelhead		
Eddins	Paid Lease	0.50	1984	123.90	41.30	RM 20 to 2.75	steelhead		See City of Dufur
Eddins	Paid Lease	0.32	1869	71.82	29.24	RM 20 to 2.75	steelhead		
City of Dufur	Donated Lease	0.46	1886			RM 40 to 2.75	steelhead	Watermaster maintains flow of 1 cfs or more for "stock water needs" as per the decree. Water rights senior to early 1900's are fully protectable throughout irrigation season.	Total of all instream water rights is 1.55 cfs. Watermaster will shut off water rights junior to early 1900's to meet the instream right. Visit creek with watermaster to confirm plan. Ensure 1.55 cfs always flowing in creek.
City of Dufur	Donated Lease	0.04	1905	4.80		RM 40 to 2.75	steelhead		
City of Dufur	Donated Lease	0.10	1906	12.30		RM 40 to 2.75	steelhead		
City of Dufur	Donated Lease	0.03	1921	6.00		RM 40 to 2.75	steelhead		
City of Dufur	Donated Lease	1.12	1963			RM 40 to 2.75	steelhead		
City of Dufur	Donated Lease	0.10	1977			RM 40 to 2.75	steelhead		

Eightmile Creek

Project Name	Contract Type	Rate	Priority Date	Duty	Acres	Location	Species	Discussion	Monitoring Needs
Miller	Paid Lease	0.19	1909		15.00	RM 30 to mouth	steelhead		
Miller	Paid Lease	0.51	1968	122.40	40.80	RM 30 to mouth	steelhead		
Miller	Paid Lease	0.32	1973	77.70	25.90	RM 30 to mouth	steelhead		
Davis	Donated Lease	0.09	1892-1901	21.30	7.10	RM 17 to mouth	coho, steelhead		
Davis	Donated Lease	0.00	1919	0.90	0.30	RM 17 to mouth	coho, steelhead		
Davis	Donated Lease	0.09	1968	20.70	6.90	RM 17 to mouth	coho, steelhead		

Monitoring Methods Summary for Newsletter
Fall 1999 (Draft)

The challenge of monitoring OWT instream water rights

OWT last reported on our monitoring activities in the Fall/Winter 1996 Fish Flow News. At that time OWT's only permanent acquisition was 0.05 cubic feet per second (22.4 gallons per minute) and there were 6 cfs of more senior consumptive water rights on the stream. All of OWT's other water rights were short-term leases. This made for limited, short-term monitoring. Since that time, the OWT portfolio of water rights has increased to 40 leases and 11 permanent water rights. (See OWT's 1999 Portfolio of Instream Water Rights). The acquisition of permanent, measurable, senior water rights on our priority streams requires development of more creative and permanent monitoring strategies. Last year representatives of OWT met with Geoff Huntington and Tom Paul of the Oregon Water Resources Department (OWRD) to discuss the development of accurate and cost-effective monitoring strategies.

The following three OWT priority stream systems have permanent, protectable instream water rights in place. OWT is working with OWRD on developing a variety of strategies to make sure the water is protected in the stream.

Several cfs make a difference - but only if the water is in the stream

Squaw Creek, which flows through the City of Sisters in the upper Deschutes Basin, currently provides habitat for bull trout, redband trout and spawning kokanee. In the late summer extensive irrigation withdrawals reduce streamflow through a ten mile stretch of Squaw Creek and can entirely dewater the stream for approximately three miles. Before the 1998 irrigation season OWT permanently purchased 0.86 cfs (386 gallons per minute) of an 1885 Squaw Creek water right to restore flow to the dry stretch. To ensure that flow remained in the stream, an intern for the Oregon Water Resources Department read a **staff gage** daily for the summer and compiled the data in the graph shown below.

In early July 1998 the flow at the gage was approximately 50 cfs, but less that one month later it fell below the senior instream water right of 0.86 cfs. At that time Kyle Gorman, the Watermaster reduced upstream diversions of water, to meet the senior instream water right. In 1999 OWT permanently purchased additional Squaw Creek rights, making the current 1885 instream water right 1.81 cfs (812.3 gallons per minute). In a year like 1998, of the 33 days measured on the graph, Kyle would have had to reduce upstream withdrawals on five days to meet the new 1.81 cfs instream water right.

Monitoring: Permanent instream water rights bring with them the challenge of more active and permanent monitoring. On Squaw Creek the most effective monitoring device is a **gaging station**. OWT and OWRD have made a joint application to Oregon Watershed Enhancement Board (OWEB, formerly GWEB) to secure approximately $15,000 to construct the station on Squaw Creek. Kyle Gorman, the Watermaster said, "Since there are 1.81 cfs of early priority date water rights converted to instream water rights in Squaw Creek, it is

necessary to install a measuring device capable of making sure the flows are being met." If we are awarded funding for the station, OWT and OWRD will construct it together, and anyone with a computer and a modem will be able to monitor the instream water right measurements, made at 15 minute intervals. Until that time, during low flow periods, Kyle and his staff will continue to read a staff gage.

Little Bits Add Up

The Little Butte/South Fork Little Butte Creek system in the Rogue Basin of Southwestern Oregon provides critical habitat for coho, chinook and steelhead and is one of the systems where OWT is most active. This year Little Butte has examples of almost every tool for creating instream water rights: four short-term donated leases, one long-term donated lease, a short-term paid lease with an irrigation district, a permanent purchase and a conserved water program project. Many of these water rights are small and would be difficult to monitor alone; however, the additive effects of the acquired rights create significant, measurable water.

Monitoring: The Little Butte Creek Watershed Council and the OWRD received funding from the Governor's Watershed Enhancement Board (GWEB) to install **six full telemetry gaging stations**. They are expected to be installed and operating before this years fall rains begin. By the 2000 irrigation season OWT will be able to ensure that the 0.53 cfs (119 gallons per minute) permanent instream water right flows in Little Butte Creek from the point of diversion at river mile 13, past a major diversion at the city of Eagle Point, to approximately river mile 4. Although we will be able to get this "real time" information, we still require other tools to monitor the instream water rights.

The Rogue River Valley Irrigation District is building a **v-notched weir** to put in the fish ladder near their diversion at river mile 1.4 of the South Fork Little Butte. This is necessary to insure that the 1.278-cfs instream water right flows through the lower portion of South Fork Little Butte to provide connectivity to the main stem of Little Butte Creek, not just through the fish bypass. A measurement by the gaging station downstream only tells us that the water is in the stream at that point, not whether it came through the fish bypass or down the channel of the creek. OWRD also plans to install a **rectangular weir** near the grist mill at Eagle Point on Little Butte Creek. OWRD staff will read the measurements on the weirs every two weeks throughout the irrigation season.

An Issue of Seniority

Larry Toll, the Watermaster responsible for regulating the streamflow in Fifteenmile Creek in the Hood Basin for the past 13 years, always maintains a minimum flow for "stock water needs" as required by decree. The 1999 instream water rights in Fifteenmile Creek total 4.568 cfs (2050 gallons per minute) with priority dates between 1869 - 1977. Though the total cfs is relatively large, this number is misleading. Since many of the rights have a relatively junior priority date, they will not be met when the creek experiences low flows -- the critical time for the steelhead that depend upon the water for rearing habitat. Larry Toll said, "In a normal year, water rights with a priority date of 1920 or older would not be shut off." Larry has

never regulated water rights older that 1906 on Fifteenmile Creek so OWT considers our 1906 and older water rights to be rights that will definitely remain in the stream in an extremely low flow year. Those rights total 1.55-cfs (697 gallons per minute), 0.30 cfs of which is a permanent instream water right acquired this year.

Monitoring: This year Larry Toll has not yet regulated the system because late snowmelt kept Fifteenmile Creek flowing much higher than our acquired rights. In the event of a dry year, Larry is committed to monitoring and regulating the instream water rights. He applied for funding for four gaging stations along Fifteenmile Creek. The funding was not approved, so for the time being Larry will visit the creek two to three times per week, depending upon the activities of irrigators. Each year, OWT staff visits Larry in the dry season to monitor the stream along with him. In an actively regulated system, the OWT instream water right ensures that at least 1.55 cfs will continuously flow through the stream.

As OWT acquires more permanent, multiple and senior water rights on some of our priority streams the challenges of active and cost effective monitoring increase. Although each stream system is different, the common solution to monitoring permanent water rights is the construction of permanent gaging stations. Soon measurement of the Little Butte Creek System with six "real time" gaging stations will be available. Eventually we hope for the same tool on Fifteenmile and Squaw Creeks.

Oregon's creeks and streams are all of ours to enjoy. Both permanent instream water rights and senior leases need to be monitored to insure that instream water rights are met. If you are interested in ensuring that the water acquired and held for the people of the State of Oregon is actually flowing through a stream in your area, please refer to the 1999 instream water rights and contact OWT to participate in a volunteer monitoring plan.

Monitoring Methods Technical Background

Protecting OWT instream water rights
Analysis of Strategies and Potential Methods
November 16, 1999

Although OWT is in effect a broker for water rights which are held by the state, considerable resources are expended to acquire instream water rights. To ensure that those investments are protected, OWT works along with OWRD on monitoring the instream water rights. When permanent, measurable flow is transferred into the stream, and public and private funds have been expended for the water, methods of ensuring the flow is in the stream must be evaluated. Following is an evaluation of the costs and benefits of various monitoring strategies.

It is important to note that not all instream water rights are of a measurable quantity or priority date. The following discussion pertains to measurable instream water rights.

First, OWT can always check for existing gauging stations on the OWRD web page: there is both real-time streamflow data and historical data organized by basin at http://www.wrd.state.or.us/surface_water/realtime/index.html

MONITORING STRATEGIES:

Streamwalker Program:

Evaluation:

- Funding an employee of OWRD with the authority to regulate a system is more efficient than funding someone who doesn't have that authority because regulation would occur immediately rather than calling a Watermaster, who may not put instream water right regulation at the top of the list.
- It is one way to be certain that instream water rights are monitored by providing funding for the job. Foundations and other contributors could be assured of instream water right protection. Contributing is a way to show OWT commitment to streamflow enforcement on the ground and partner with OWRD.
- The OWRD would be responsible, as it should be.
- This is not a permanent strategy. If the funding expires, then the program no longer exists.
- OWT would rely on employees of OWRD.
- Philosophical considerations about paying for the OWRD to do the job they are required to do anyway.

Cost: $4,000 per summer per Streamwalker. One Streamwalker can usually actively monitor a 4,000 - 6,000 acre area.

Volunteer Monitoring Program:

Evaluation:

- One strategy to engage people in OWT programs.
- Enhanced local support and recognition of problem.
- Potentially more constant and thorough monitoring than the OWRD currently provides (most instream water rights are checked every two weeks during the dry season by OWRD).
- Would have to call Watermaster and rely on Watermasters schedule for regulation.

- Unpaid volunteers may not have the training and/or the incentive to monitor effectively.
- Data may have less credibility in the view of the Agencies and Foundations.

Cost: Staff time to educate volunteers, coordinate monitoring and compile data. Costs of appropriate measurement devices.

Partner with groups:

In the past OWT has had success with partnering with local groups and agencies to monitor instream water rights. For example, IVSWCD uses OWT hobos to monitor water temperature throughout the irrigation season and sends OWT the data on Sucker Creek. In addition, Brian Wolcott with the Walla Walla Watershed Council monitored the ten year lease on Couse Creek. Identifying partners through local Watershed Councils, Soil and Watershed Conservation Districts, Oregon Department of Agriculture, the Department of Environmental Quality and other "in-the-stream" groups has been a successful strategy in the past.

WATER MEASUREMENT DEVICES:

Permanent instream measurement devices:

Gauging Stations:

Evaluation:

Pros:

- Provide real-time (in stations with telemetry and satellite capability), continuous measurement of the flow in a stream.
- Can be monitored by anyone with a computer and Internet capability at any time. Increases likelihood that OWRD will regulate for an instream right.
- Records data for use in the future. (Historical streamflow data for future evaluation).
- Permanent monitoring device (barring floods and assuming availability of $1,200 per year).

Cons:

- Although intended to be permanent, high flood events demolish gauging stations and expensive equipment is lost.
- Gauging stations require considerable resources (see cost).
- Need $1,200 annually for telemetry. Without telemetry OWRD must travel to the station to measure flow.

Cost: (based upon an estimate by Kyle Gorman)

Preparation - 5 days
Installation - 20 days
$10,000 to install the station
$ 1,200 to BOR for the satellite
$ 5,000 for telemetry
$ 500 for temperature data
$16,700 for a gauging station + $1,200 per year + preparation and installation time.

Flume:

- Free program from BOR for design and inexpensive to install
- Permanent structure (concrete)
- Will require OWRD time and it can be assumed instream right will be evaluated once every two weeks.

Cost: http://ogee.do.usbr.gov/twahl/WinFlume_RampFlume is a free design program for a flume. Flume installation requires cost the materials which vary depending upon the size of the flume, but can be assumed at $150 - $400 for OWT purposes and the cost of labor.

Seasonal instream measurement devices: Weirs, staff gauges with rating tables, hobos (for temperature measurement)

- Relatively inexpensive ($100 - $300)
- Especially appropriate for temporary, short-term leases
- Require OWRD to visit the stream. Can assume monitoring once every two weeks during the irrigation season.

OWT Hobos and Marsh-McBurney flow meter are available for measuring specific streams. Requires OWT staff travel and time.