

PRESIDENT'S NOTES

by Adam Gravley, President, AWRA Washington Section

This newsletter highlights AWRA's activities to support students and to fulfill the educational component of the association's mission. As longtime board member Stan Miller reports inside, the AWRA has consistently supported water resources students with scholarships and has recently increased the level of commitment. Last year, we awarded two student fellowships and increased the award to \$1,500 each. Last year's winners -- Sarah Ogier and Suzane Shull -- have prepared articles concerning their interesting and timely work. Applications for 1998 AWRA Student Fellowship awards are currently being accepted through September 15, 1998, and will be awarded at our fall conference on November 12, 1998.

In addition to the fellowships, the AWRA has assisted in the establishment of a student chapter at the University of Washington. Student Chapter President Erin Nelson reports on the recent annual AWRA state section and student chapter's second annual UW social. Derek Booth spoke on urban stream restoration.

This issue also focuses on regional water supply planning and presents a range of agency perspectives. From the broadest view, Steve Hirschey of the Department of Ecology discusses the tri-county effort to respond to the proposed ESA listing of Puget Sound Chinook populations. Next, King County regional water supply views are presented by Gwenn Maxfield and Holly Kean. As the Chair of the Interim Water Group, Gwenn discusses issues and opportunities in organizing the Cascade Water Alliance. As East King County Regional Water Association Executive Director, Holly provides an update on the Snoqualmie Aquifer Project. Finally, John Engel of Snohomish County reports on the longstanding estuary restoration efforts of a single drainage district. ☪

Ecology Announces Plans For Making Water Right Decisions

OLYMPIA – The Washington Department of Ecology has finalized plans to make processing water rights more efficient and predictable. Ecology adopted the rule this month, after a five-month public-involvement process. This is in keeping with a State Supreme Court decision (in Hillis vs. Ecology) that directed Ecology to involve the public in how the agency makes decisions about which water right applications to process. Under the new rule Ecology will make most decisions on new applications and changes to existing water rights within basins, processing the oldest applications first, with these three primary exceptions:

- Situations where failing public-water systems are threatening public health or safety;
- Non-drinking-water purposes that involve preserving public health, safety, or where there would be a substantial environmental enhancement; and,
- Requests to change existing water rights that offer opportunities to substantially enhance the environment or provide public-water supplies to a particular area, or when a court for adjudication (determining water rights) directs the change.

The new rule also describes how Ecology will use watershed assessments as a tool for gathering information and making water-right decisions.

During the next 14 months, Ecology plans to make decisions based on issues such as the number of applications, how long water-right applicants have been awaiting decisions, the amount of water being requested and other key elements described in the rule, in portions of the following areas:

- Benton and Klickitat counties, Rock-Glade Horse Heaven-Hills area
- Clark County, Salmon Creek and Washougal River
- Columbia and Garfield counties, Tucannon River
- Island County
- Kitsap County
- Okanogan County, Methow Valley
- Spokane, Stevens and Lincoln counties, Spokane River
- Thurston County, Deschutes River

"This rule gets us one step closer to planning for water use, and managing water by watersheds," said Keith Phillips, manager of Ecology's Water Resources Program. "Through the watershed work...I expect we'll be able to increase our certainty of making water right decisions." ☪

Central Puget Sound Response to ESA Proposed Listing for Chinook Salmon

Steve Hirschey, Department of Ecology

Under the initial leadership of the three county executives representing Pierce, King and Snohomish Counties, the Central Puget Sound region is proposing to develop a coordinated response to the proposed listing of Chinook salmon populations. There have been three gatherings, called Community Leaders Forums, of locally elected representatives from the cities, counties, and special purpose districts along with state and federal regulators from across the region. These forums have responsibilities related to natural resource management and/or responsibilities for developing or reviewing a recovery plan. The series of meetings has resulted in several significant decisions being made. A Convening Vision Statement has been completed as well as Principles for the Central Puget Sound ESA Response that documents the vision, goals, challenges, reasons why working together is a good idea, and most importantly the guiding principles to shape any response plan.

The organizational framework proposed is a three tiered organizational structure: the Community Leaders Forum as the first level, an Executive Working Committee (EWC), as the second level and the local watershed planning efforts as the third level. The membership of the EWC is set at 33 individuals who have been identified. There will be ten representatives for each county, and three at large appointments. Each county has representation from the county, city, business, special purpose district, Tribal government, and environmental communities. The three at-large representatives will represent the Northwest Indian Fisheries Commission, the Boeing Company, and the University of Washington. It is anticipated the Executive Committee will be a decision-making, working committee making the decisions related to regional issues and regional fish recovery strategies. The third level will be the watershed. The individual watershed plans will identify the protection and restoration actions, identify how they will be implemented and how the monitoring of plan implementation will be conducted.

Prior to developing the salmon recovery plan, a work plan has been developed by personnel of the various agencies at a staff level on an ad hoc committee and a consultant trying to craft a road-map to respond to the proposed listings. Over the next few months, the work plan to create a salmon restoration plan will be finalized and the relationship of local watershed planning to regional planning will take shape. Perhaps one of the first tasks will be to define the geographic scope of the "regional plan."

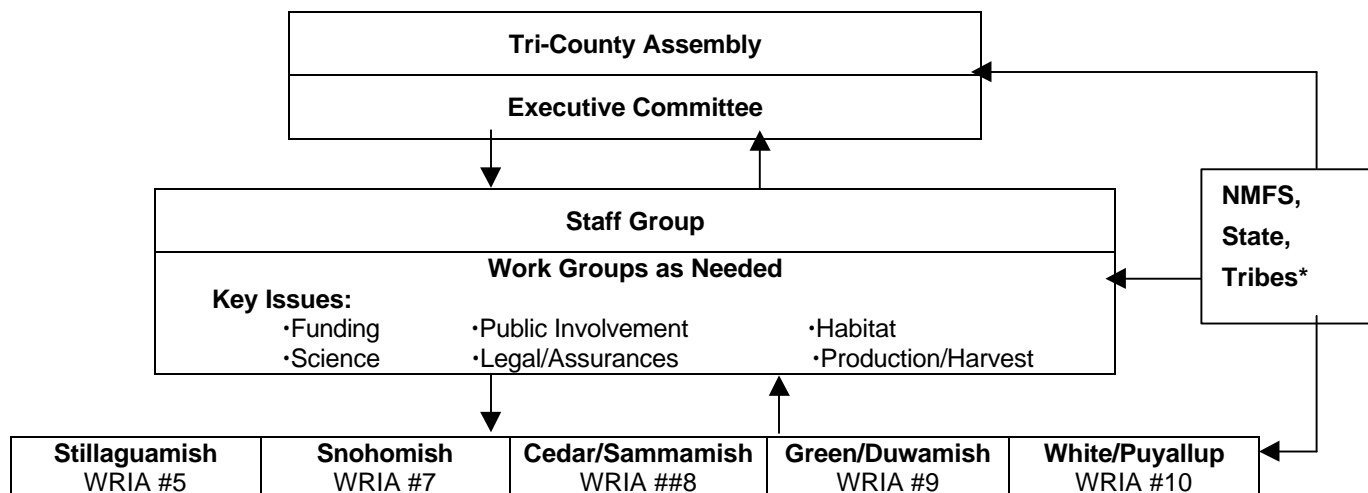
The National Marine Fisheries Service's (NMFS) proposed listing on February 26, 1998, covers the entire Ecologically Sensitive Unit (ESU) called Puget Sound, a twelve county area. The Central Puget Sound effort, at this time, covers three counties and five watersheds, the White/Puyallup, Green/Duwamish, Cedar, Snohomish, and Stillaguamish. Based on discussions at the May 11, 1998 Community Leaders Forum, the Nisqually watershed may be added.

Many people representing the counties, cities, state, and special purpose districts have been working since last October exploring options to respond to the proposed listing. The current idea is to create a salmon restoration plan. The proposed plan will be a combination of two basic components and will inform the NMFS and U.S. Fish and Wildlife Service of actions that will be taken to protect, restore and recover salmonid habitat. The recovery plan will most likely be a combination of Habitat Conservation Plans (HCP's) that will allow NMFS to issue incidental take permits (under section 10 of the ESA) to those parties covered under the plan, or watershed based plans that will allow local government actions, or a class of actions to be covered by a 4(d) rule. HCP's are currently being developed by the City of Seattle (Cedar watershed) and the City of Tacoma for the Green River watershed. Section 4(d) of the ESA allows the NMFS to customize regulations to conserve species listed as threatened. The 4(d) rule will specify measures that are underway that conserve a listed species and that are free from ESA restrictions.

The issues the recovery plan might address are currently being scoped. Currently, sub-committees of the ad hoc group are working on a workplan; federal, state, and local funding; existing policies and programs; urban area issues; water for people; habitat; public outreach; and land use and the Growth Management Act. You may have noticed the words tentative and proposed sprinkled through this article. The reason is that all of the parties to this dynamic process are concurrently learning about the ESA, and proposing how to respond. There is no tried and true road map; we make it up as we go and correct our course when needed. The magnitude of the Central Puget Sound effort is also without precedent. As Steven Foster said in his article on the ESA Proposed Listing for Chinook Salmon in Puget Sound in the previous issue of this newsletter, the response to the proposed listing will truly be a regional effort if we are to succeed. ☺

TRI-COUNTY ESA RESPONSE

ORGANIZATIONAL FRAMEWORK



*NMFS, State and Tribes have involvement and close coordination at all levels.

EXECUTIVE COMMITTEE

SNOHOMISH COUNTY

- Bob Drewel**, *Snohomish County Executive*
- Dave Somers**, *Snohomish County Council*
- Terry Williams**, *Tulalip Tribes*
- Ed Hansen**, *Mayor of Everett*
- John Mohr**, *Port of Everett*
- Barbara Caims**, *Long Live the Kings*
- David Gent**, *Wilder Construction*
- Dana Graupman**, *Pilchuck Audobon Society (Environmental)*
- Matt McCune**, *Mayor of Stanwood*
- Kim Levesque**, *Snohomish Soil Conservation Department*

KING COUNTY

- Ron Sims**, *King County Executive*
- Louise Miller**, *King County Council*
- John Daniels, Jr.**, *Muckleshoot Tribe*
- Paul Schell**, *Mayor of Seattle*
- Gary Grant**, *Port of Seattle*
- Chuck Mosher**, *Deputy Mayor, City of Bellevue (Suburban Cities Assoc. & Cascade Water Alliance)*
- Walt Canter**, *Cedar River Water & Sewer District (Special Districts)*
- Maryanne Tagney-Jones**, *Washington Conservation Voters (Environmental)*
- Larry Phillips**, *King County Council (King County Watershed Forums)*
- Sam Anderson**, *Master Builders Association of King & Snohomish County*

PIERCE COUNTY

- Doug Sutherland**, *Pierce County Executive*
- Karen Biskey**, *Pierce County Council*
- Bill Sterud**, *Puyallup Tribe*
- Brian Ebersol**, *Mayor of Tacoma*
- Ted Bottiger**, *Port of Tacoma*
- Ken Martin**, *Mayor of Puyallup*
- Bill Wilkerson**, *Washington Forest Products Association (timber)*
- Lucy Cerqui**, *Pierce/King County Farm Bureau (Agriculture)*
- Bernalyn McGaughey**, *Compliance Services International (Business)*

AT LARGE APPOINTMENTS

- Billy Frank, Jr.**, *Chair, Northwest Indian Fisheries Commission*
- Tom Waite**, *Boeing Company*
- Bridgett Chandler** (*interim representative*), *University of Washington (Science Panel)*

East King County Regional Water Association

Holly Kean, Executive Director

Formed in 1987, the East King County Regional Water Association (RWA) is a coalition of special purpose districts and cities which provide water service. The members are:

Cities:

◆ Duvall ◆ Issaquah ◆ Kirkland ◆ Redmond
◆ Renton ◆ Snoqualmie

Water districts:

◆ Coal Creek Utility ◆ Covington Water
◆ Water District No. 119
◆ Cedar River Water & Sewer
◆ N.E. Sammamish Sewer & Water
◆ Sammamish Plateau Water & Sewer

The first major project of the newly formed RWA was the writing of the 1989 East King County Coordinated Water System Plan (CWSP). Fifty-seven water utilities within the East King County Critical Water Supply Service Area spent over two years putting the plan together. The final document dealt with service areas, utility service review procedures, minimum design standards, satellite system management, conservation, and future water supply options. The plan was certified by the King County Council to be consistent with its land use and shoreline policies and approved by the Washington State Department of Health in 1990.

After that landmark project was completed, the RWA shifted its focus to concentrate on water conservation and finding a new water supply for the Eastside. With Seattle Public Utilities as its partner, the RWA Board of Directors decided to test the theory that a large aquifer existed in the Snoqualmie Valley. CH2M Hill was hired in 1992 to perform a preliminary engineering study on all three forks of the Snoqualmie River. The report concluded there was a potential for groundwater but the ranges of 10 to 100 million gallons a day had to be investigated.

In 1993, Golder Associates was hired to conduct geophysical soundings in preparation for drilling an exploratory well. The soundings indicated that drilling on the Middle Fork of the river might yield the most promising results.

In 1994, the RWA directed Golder to drill an exploratory well. A 360 feet well was successfully drilled, however, not without some anxious moments. The rocky landscape did not make the task easy. A large boulder located 70 feet below the surface had to be dynamited. After seven weeks of difficult and tedious drilling, a water-bearing stratum was hit at 260 feet and continued downward for another 100 feet. The stratum was composed of clean, good-sized gravel, or "liquid gold." A 72 hour pump test was conducted which was also not done without headaches. The residential neighborhood was understandably up in arms over the constant noise of the pump, but the test had to be completed. It was a gusher: 2.2 millions gallons a day

(MGD) out of a six inch pipe. The Snoqualmie Aquifer has the capacity to supply 40 MGD.

Two more wells were drilled in 1995. One 720 foot well helped define the characteristics of the recharge area which soaks up rainfall like a sponge. A groundwater model developed by Golder indicates some degree of continuity with the lower reaches of river above Snoqualmie Falls.

In 1996, potential routes and the costs of delivering 40 million gallons a day were reviewed. One route would go directly from a wellfield, east of the City of North Bend, to the Tolt River Regulating Basin. A second route would follow the I-90 corridor into the Eastside Reservoir in the Lake Hills area. The third route would once again follow I-90 and up onto the Sammamish Plateau. All three routes would entail the construction of 30 miles of pipeline. The levelized costs, including capital costs, the present value of future capital costs, the annual O&M costs, and the present value of future O&M costs over a 100 year period range from \$4.05 to \$4.61 million for one million gallons of water delivered.

Very late last year, Golder and its subcontractor, HDR Engineering, came up with a fourth alternative for using the water which would enhance the in-stream flows of the Snoqualmie River. During the summer, water from the aquifer would be pumped directly into the Snoqualmie River. The river would carry the groundwater over Snoqualmie Falls toward the City of Duvall where it would be withdrawn and piped to a filtration plant located somewhere on the Sammamish Plateau. Water would then be supplied from the filtration plant to the regional water supply system and directly to the two water districts on the Sammamish Plateau by short pipelines. Water could also be withdrawn in the winter when streams are above their state-required flow.

At this time, this fourth alternative is preferred as it will provide a regional water supply while increasing stream flow in the Snoqualmie River during the summer. One substantial benefit of this approach is the improvement of water quality and fish habitat conditions for the Chinook salmon which may soon become a federally listed threatened species under the Endangered Species Act. Though not yet completed, it is expected that the cost of this fourth alternative would be competitive with that of the first three alternatives.

The Washington Department of Ecology is expected to issue a preliminary permit this fall which will list the additional data, information, and physical evidence needed before it can determine whether a water right permit can be issued for the Snoqualmie Aquifer Project. Fulfilling the requirements of the preliminary permit is expected to take three years.

Other accomplishments of the RWA include:

- A charter member of the Water Conservation Coalition of Puget Sound whose members serve 65% of the State's population;
- A founding member of the Snohomish River Basin Work Group, a committee guiding the Snohomish WRIA toward a watershed plan;
- A member of a tri-county committee set up to develop a more uniform process for making regional water supply and demand projections;
- An active member of the Washington Water Utilities Council;
- A 1993 addendum to the East King County Coordinated Water System Plan approved by King County and the Washington State Department of Health;
- A 1996 update of the East King County Coordinated Water System Plan approved by King County and the Washington State Department of Health;
- A catalyst, along with the Washington State Department of Health, in persuading King County to change its land use policy to allow Group A water service in the rural areas; and
- Assistance to the utilities relying on groundwater with a map of aquifer recharge areas which was included in the King County Comprehensive Plan.

WA SECTION AWRA BOARD MEMBERS

President: Adam Gravley
(206) 623-7580

Vice President: Teresa J. Platin
(425) 453-5005, ext. 5235

Treasurer: Mike Wert
(206) 624-9190

Secretary: Peter Sturtevant
(425) 453-5545

Editor: Chris V. Pitre
(425) 883-0777 ext. 2071

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(425)-649-7140

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(509) 456-6024

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Director: Fran Solomon
(206) 296-1924

Faculty Advisor: Derek Booth
(206) 543-7923

This newsletter is a publication of the Washington Section of the American Water Resources Association. It is published bi-monthly. This is a forum for members to share ideas and opinions; opinions expressed in the AWRA Newsletter are those of the authors and do not necessarily represent the official position of the WA Section of AWRA.

Submissions are welcome for the July/August/September newsletter. The submittal due date is July 8, 1998. The editor reserves the right to make changes for reasons of length, grammar, legality or clarity. Contact Chris Pitre at (425) 883-0777, or send submittals directly via:

Internet Mail: cpitre@golder.com (most document/graphic formats are acceptable)

Recent newsletters are available on: <http://earth.golder.com/waawra/>

What this State Section is All About!

The WA State Chapter of the AWRA fosters educational and professional development.

Student support is provided in the form of two annual student fellowships, sponsorship of a student chapter at the University of Washington, and underwriting of a special meeting in the early summer hosted by the student chapter and other subsidies.

Interorganizational support is fostered with local, interstate and international organizations.

A **bimonthly newsletter** is published containing in-depth analysis and editorials on current issues.

Several **dinner meetings** are held throughout the year providing good food and good company followed by a presentation by featured guests. **Brownbags** are organized on special issues as they arise.

The annual climax is a **Fall Conference** in November which is the principal funding vehicle for many Section activities, including providing financial support to the Section's Student Fellowship program.

A **dedicated board** of 15 members meet regularly to plan, organize and facilitate events.

The Washington Chapter has been selected to host the **1999 National AWRA Conference**.

If you wish to learn more about your Section and/or wish to participate more in Section activities, you will be warmly welcomed. Please contact any of the board members listed in the side board to the left.

Cascade Water Alliance

Gwenn Maxfield, Commissioner, Woodinville Water District and Chair, Interim Water Group

In August, 1995, Seattle, suburban cities and King County water districts agreed to create an agency that would plan for and deliver water to the urban(izing) areas within the county. The Interim Water Group is commissioned with forming this agency, to be called the Cascade Water Alliance (CWA), and is currently accepting members including suburban purveyors and neighboring urbanizing utilities. Current members include:

Cities:

◆Auburn ◆Bellevue ◆Bothell ◆Duvall
◆Edmonds ◆Kirkland ◆Issaquah ◆Kent
◆Mercer Is. ◆Redmond ◆Renton ◆Tukwila

Water districts:

◆Bryn Mawr ◆Cedar River ◆Highline
◆Northshore ◆Olympic View ◆Shoreline
◆Skyway ◆Soos Creek ◆Woodinville
◆Water districts 20, 45, 49, 83, 85, 90, 107, 119, and 125

No longer solely a renter of Seattle's water system, Cascade Water Alliance members will have the responsibility to develop new water sources consistent with Growth Management decisions. Meeting environmental requirements and addressing the fish-instream flow concerns raised under the Endangered Species listing are likewise major issues for the Alliance. The potential exists, and is, in fact great, for a regional group to meet these challenges. As a regional organization, CWA could extend a transmission system that delivers water throughout the King County region. Tapping into available permitted sources as needed for fish and people could become the Alliance's major contribution to both of these important needs.

In addition to organizational issues, the Interim Water Group, forming the Cascade Water Alliance, is working with regional agencies to develop plans that meet requirements and expectations. As a (future) large water supplier in the Central Puget Sound, Alliance representatives are participating with city and county agencies in Pierce, Snohomish and King counties to develop a common approach to comprehensive water supply planning.

Seattle has been a consistent proponent of the Alliance since the Tri-Caucus Accords. Negotiations between Seattle and the Alliance have included the agreed-upon concepts from the Tri-Caucus. For example, if shortages do occur, either nature-induced or lack of new supply, CWA members and Seattle will share in the shortage. From a psycho-

logical point of view, this is an important point because it means members will execute shortage management plans consistently. Lawn watering restrictions, for example, will be uniformly implemented.

Seattle also retains ownership of its existing system, while the Alliance will own any newly developed system. The Alliance will develop new supply sources, and Seattle has agreed not to compete for new source development. While we continue to work with Seattle in water supply planning and areas of mutual interest, the relationship has changed from renter to equal partner.

King County recently extended its support for the formation of the Cascade Water Alliance as a regional water supplier. County officials express interest in working with CWA to implement a regional reclaimed water program. As the regional wastewater treatment provider and regional water supply provider, the County and the Alliance, respectively, can help solve the water supply issues facing a growing suburban population while honoring Growth Management decisions set at the state and county levels.

The forming Interlocal Agreement was distributed on May 20 at a special event hosted by the Alliance. Seattle purveyors will also be reviewing the newly negotiated Seattle-Cascade Water Alliance contract, as their Alliance membership will ultimately result in a new contractual relationship with Seattle. May 20 is an exciting time for the Alliance, as it culminates two years of intensive committee work and contract negotiations.

As Cascade Water Alliance takes shape, it sets in motion the Tri-Caucus goals stated eight years ago. Seattle Purveyors wanted to have responsibility for their water supply and authority to implement decisions as appropriate for the suburban areas. The environmental climate has, of course, changed during those ensuing years. This regional Alliance is proving to be a creative and flexible vehicle to address environmental concerns as well as population and related economic pressures.

(Details of CWA background were shared in the November 1996 issue of the Washington AWRA newsletter, should anyone want further information. Interested parties can also call Lori Ferlito at 425-820-4544 to obtain the issue paper describing the organization.)

Flood Protection, Dike Decommissioning & Habitat Restoration: Snohomish County Drainage District 6

John Engel, Snohomish County Public Works

In Western Washington, approximately 90 percent of the estuarine and tidally influenced wetlands have been lost to urban and agricultural development. The Snohomish River Estuary has lost nearly 75 percent of its original wetlands, yet represents one of Washington's best opportunities to reverse this trend. Snohomish County, in cooperation with other agencies and private corporations, is protecting and preserving the estuary and its remaining wetlands through land purchases such as Otter Island, Spencer Island, and North Ebey Island. The latest effort to expand the protected areas in the Snohomish River Estuary is the restoration of Drainage District 6 in the upper estuary.

Drainage District 6 was formed in the 1920s when dikes and drains were built to protect 450 acres on the south bank of Ebey Slough in central Snohomish County. The district has been primarily used as pasture land since its formation and has flooded several times since the dikes were first built.

In 1992 the Snohomish River Comprehensive Flood Control Management Plan recommended acquiring 350 acres of the Drainage District and restoring it to its original estuary state. The acquisition was approved by the Snohomish County Council in 1993, at an estimated cost of \$1.4 million.

The restoration plan developed by a committee of biologists, engineers and funding agency representatives is to return the district to a tidally influenced wetland by breaching the dike in 4-5 places. The breaches will connect District 6 to Ebey Slough and will restore tidal flow to about 233 acres of freshwater wetlands. The area acquired but not converted to a tidally influenced wetland will improve habitat quality for waterfowl and other wildlife. Before the breaches are made a new cross dike will be built between District 6 and adjacent areas to continue flood protection to property outside of the restoration area.

A commitment to protect the estuary: The Drainage District 6 restoration area is the fifth link in a chain of restoration projects in the Snohomish River Estuary and will especially complement the 450 acre state Fish and Wildlife preserve directly across Ebey Slough from Drainage District 6.

Fish & wildlife habitat: The return of Drainage District 6 to a functioning estuarine wetland will increase critical habitat for Snohomish River salmon, steelhead, sea-run cutthroat and other fish, improve the habitat of migratory birds of the Pacific Flyway, and provide habitat for a variety of native wildlife.

Increased flood protection: Because the restoration area will store flood waters, adjacent agricul-

tural areas are expected to have significantly lower flood levels during small floods. In larger floods these areas will flood more slowly and spend less time under water.

Education & recreation: The Drainage District 6 project is one of the largest restoration efforts in the United States. Restoring this area to its natural habitat will create an opportunity for professional research as well as an outdoor classroom for all Puget Sound residents and our elementary, high school and college students. A dike-top interpretive trail planned along Ebey Slough will guide Puget Sound families through a recreational tour of the restoration project and give sport fisherman new access to the slough.

Better use of public funds: A significant benefit of the restoration project is that the public will no longer pay to repair flood damage to the Drainage District 6 levee every 2-5 years. Since 1960 at least \$2.2 million have been spent on repair of the levee and repair costs average \$80,000 each year.

A model for the future: The legacy of the Drainage District 6 project will not stop with the project's completion. The cooperation and commitment of government agencies, nonprofit organizations, private companies and individual landowners can serve as a model for restoration projects in the Puget Sound region and in the nation.

Funding Sources:

\$350,000 - State Building & Construction Fund
\$150,000 - State Flood Control Assistance Account Program
\$925,000 - National Coastal Wetlands Conservation Program
\$850,000 - Snohomish County Conservation Futures Program
\$850,000 - Aquatic Lands Enhancement Account (DNR)
\$250,000 - Wetland Reserve Program (NRCS)
\$230,000 - Olympic Pipeline Company
\$185,000 - City of Everett
\$3.8 million - Total

Proposed Schedule

Spring 1998 - Summer 1998, Final engineering
Fall 1998 - Summer 1999, Construction

For more information contact: John Engel, Project Manager, Capital Improvement Project Engineer III, Snohomish County Public Works, Surface Water Management Division (425) 388-3464 ext. 4560. ☎

Student Education Goals of the Washington AWRA Section

by Stan Miller, Spokane County, WA-AWRA Board Member

A primary mission of the Washington State Section of the American Water Resources Association (AWRA) is to foster the understanding of water resources management as an interdisciplinary science. Most of the Section's professional development program strives to achieve this goal: The annual conference features a program that examines a water resources issue from a range of technical, societal and policy positions. Our dinner meetings provide a chance to interact directly with experts in both the technical and policy arenas. Our student fellowship program provides the Section with the opportunity to encourage students to become the future leaders in water resources management by supporting promising individuals with a financial incentive to pursue their studies – the AWRA Student Fellowship Award. Because AWRA recognizes the interdisciplinary nature of water resources management, the Section seeks students who are applying a range of disciplines to their research problems for the fellowship program.

Since the early years of its existence, the Washington State Section has provided support to a "full-time graduate student completing an advanced degree in an interdisciplinary Water Resources subject." The amount of the one year stipend has risen from \$500.00 for the first award in the mid-1980s to \$1500.00 in 1997. Three criteria form the basis for identifying fellowship recipients: the interdisciplinary nature of the course of study and research; the potential application of the work to current needs in water resources management; and the effectiveness in communicating research objectives.

On a track parallel to the fellowship program, the Washington Section has promoted the formation of student chapters of the Association. A student chapter has always been viewed as a way to insure that qualified individuals are available to staff future water resources management efforts. After a few flurries of interest and false starts, a student chapter was incorporated at the University of Washington in 1997. A primary benefit of having a student chapter lies in providing the students the opportunity to interact with working professionals so they may see how the various disciplines interact to help solve problems. Just as significant is the opportunity for Washington Section members to interact more closely with the fresh ideas, research work, and the academic community, that the student chapter provides.

To promote student section membership and possibly the formation of additional student chapters, the Washington State Section Board of Directors approved offering a separate fellowship to a student chapter member. Thus, in 1997, two fellowships in the amount of \$1500 were awarded. One fellowship went to a member of the University of Washington Student Chapter of AWRA. The other was awarded "at large" in open competition to "a full-time graduate student enrolled at any accredited college or university in Washington State." The award recipients have each contributed a brief synopsis of their work for inclusion in this newsletter.

As an introduction to the world of professional development and an incentive to continued involvement with AWRA, each fellowship recipient also receives a one year membership in both the State Section and National AWRA, a one-year subscription to the *Journal of the American Water Resources Association*, and admission to the Washington State Section Annual Conference.

Over the years, a number of very useful research projects have been conducted by fellowship recipients. Often the students' work are applied directly to real world problems.

The steps taken by the Board during the last two years to increase the fellowship amount to \$1500 and expand the award to include a student chapter recipient are bold ones. The Board is considering establishment of an "endowment" fund for the program. Sources of revenue that might be used to build such a fund will include setting aside a portion of the annual registration/dues payments and providing members the opportunity to make special contributions to a "fellowship fund." Having an endowment to generate most or all of the money needed to award two fellowships per year will greatly simplify planning. Nearly all of the Section's current income comes from the annual Conference registration/dues payments of members. Fluctuations in conference expenses and attendance greatly influence the amount of funding available for the fellowship if it is supported on an annual basis. Before the Annual Conference, the Board will be examining a number of ways to generate the revenue needed to build a fund large enough to independently support the fellowship program through its earnings, and hopefully increase the amount and/or number of student fellowships available. We'll keep you posted on this. ☺

Instream Flow Protection in Washington State

By Sarah Ogier, Program Coordinator for the Green River Basin Program at King County WLRD

(Editor's note: Sarah Ogier was a 1997 Washington AWRA fellowship winner.)

For over two years I studied water resource planning and management at the University of Washington. My primary research efforts, and resulting thesis, focused on instream flow protection. I recently finished my masters degree and am pleased to have the opportunity to share some of the highlights of this research which was in part funded by the Washington State Section of the AWRA .

Instream flow protection is a timely issue today as we in Washington state are changing and reconsidering the status quo of water management in light of the Endangered Species Act and the Watershed Planning House Bill 2514. Current political realities are forcing us to reconsider how we allocate one our most precious resources – water. As a result of decades of landscape alteration and river manipulation, river flows have changed from their natural patterns. Past research has shown that protection of certain flow patterns can be critical to the ecological health of river systems.

I did not focus on the importance nor the quantity of the flows, I feel enough research indicates that in some instances instream flow protection is needed. The really tough question in my mind as a natural resource manager and planner was: **what tools are available to protect flows and are they working?** The primary objectives of my research were to: 1) identify key issues, problems, successes, and deficiencies of current instream flow protection (IFP) regulations and techniques in Washington State, by considering a model that could evaluate the effectiveness of IFP methods and 2) develop recommendations for improving the effectiveness of IFP.

The primary methods of instream flow protection available in Washington must be evaluated in terms of their effectiveness and limitations if we are to use them wisely and expeditiously. For the purpose of evaluation, IFP methods were described as regulations and techniques. I considered three regulatory methods: 1) state minimum flow regulations, 2) the state Watershed Planning Act, and 3) the state trust water rights program. Six techniques regarding water rights were considered: acquisition, leasing, donation, transfer, enforcement, and conservation.

I defined effectiveness as the extent to which the implementation of a particular method is able to protect instream flow for ecological benefit and not be limited by regulatory definition, funding, political or public support, legal constructs, or scientific complexities. I selected eleven criteria which could be used to evaluate an IFP method for effectiveness. However, it was clear that IFP methods do not fit nicely into a comparative evaluation – I could not uniformly identify the most effective methods.

Comparative evaluation is difficult due to the individual nature and scope of the methods and the unique circumstance and landscape in which a method might be applied. Rather, I recommend that an adjustable model based on the eleven criteria be used to accurately assess effectiveness. However, there may be no reasonable way to compare methods that are disparate in form and function. While evaluation of IFP methods may be time-consuming and difficult, it is a critical process for clarifying how methods can be improved and determining appropriate methods in specific settings.

To identify opportunities for improving the effectiveness of IFP in Washington State, I explored two case studies. The primary case study was an investigation of the Teanaway River IFP programs. In this central Washington agricultural basin, water right leasing, water right acquisition, and conservation measures are being used to improve the river's flow regime and protect instream flows for fish and ecological benefit. Many agencies and stakeholders are participating in this process, including a strong partnership between the Yakima Indian Nation and the US Bureau of Reclamation. Advocates hope that a more normative river may develop out of their efforts. The second case study reviews IFP in Oregon where statutory circumstance has allowed successes. Oregon's legislature has provided funding for water right processing and review which facilitates for IFP, and the regulations allow for private leasing of instream water rights. The Oregon Water Trust provides a favorable model for IFP and appears to be flourishing amidst this rather favorable legislative and regulatory environment. Both case studies offer examples of how and where IFP is working. Additionally, participants in these programs provide rich hands-on knowledge of how IFP could be improved to facilitate greater and more efficient protection.

Finally, I assert that instream flow protection in Washington is currently very limited due to a number of factors including an absence of political support, legal and administrative gridlock, and a general lack of understanding about instream flow issues. Instream flow protection advocates and natural resource managers should evaluate the status and effectiveness of IFP in Washington, look to current opportunities for protection, and learn from existing IFP successes in order that we might better protect instream flows in Washington's rivers and the natural systems which depend on them.

(Sarah Ogier is Program Coordinator for the Green River Basin Program at King County WLRD and can be reached at 206-296-1906.) ☺

Habitat Mapping in the Padilla Bay, Estuary

Suzane Shull, University of Washington Researcher at Padilla Bay

(Editor's note: Suzane Shull was a 1997 Washington AWRA fellowship winner.)

The goal of my thesis research is to develop methods of habitat mapping in the Padilla Bay, WA estuary. The objectives of my research are to identify aquatic habitat types, develop an accurate location and quantitative map of those habitats, and to estimate percent cover of homogeneous patches of eelgrass vegetation. Remote sensing techniques are utilized to differentiate between different aquatic habitat types, as well as variations in density of eelgrass vegetation. Field surveys, referred to as ground truthing, are used to document existing habitat types and estimates of vegetative cover.

Remote sensing is a means of collecting information about an observational area without actually touching it. Light from the sun is either reflected or absorbed by the objects on the earth and a multispectral sensor records the brightness of the reflected light. The data collected by the sensor is then interpreted objectively by a computer clustering algorithm that groups similar reflectance values together in a process termed unsupervised classification. The unsupervised classification attempts to identify spectrally homogeneous groups, areas of similar brightness values in each of the wavelength bands, based only on the spectral data and then assign non-sampled pixels (those not categorized) using classification algorithms such as the maximum likelihood classifier. A supervised classification is the process by which reflectance values are clustered according to the investigator's specifications. Areas on the image, which statistically characterize the habitat areas of interest, are selected based on ground truth data. The training statistics from the ground truth data represent the spectral characteristics of the habitat.

The data set is a digital image acquired as part of a Washington State Department of Natural Resources (WADNR) Compact Airborne Spectrographic Imager (CASI) survey. The CASI data is a digital picture of Padilla Bay composed of 11 spectral bands. Spectral bands are wavelengths of electromagnetic radiation. The 11 wavelength bands recorded by the sensor range from the visible blue wavelengths to the near-Infrared (IR). The reflectance intensities of each of the 11 bands are recorded into a square (pixel) representing 4 m² on the ground. For optimal viewing of submerged vegetation, aerial imagery must be timed to coincide with high seasonal biomass of the vegetation, low water turbidity, low surface waves, and low tides. To meet these requirements the CASI image of Padilla Bay is a composite of seven flight lines flown at low tide on July 14 and 15, 1996.

During ground-truthing, Global Positioning System (GPS) was used with differential post-processing to identify the location of, for example, a homogeneous patch of habitat type, such as an area of 50%

eelgrass cover. Percent cover estimates are made at as many as 5 sites per habitat-type classification by counting and documenting presence/absence and type of vegetation at cross-section grids within a quadrat. Ground truth field data are also used to verify classification results. Based on the success of similar mapping projects, I am hopeful that this classification procedure will yield at least 80% accuracy.

I have been processing the data at Western Washington University's Geographic Information Systems Laboratory using Perceptron Computing Incorporated version 6.1 on both a Sun Sparc Station UNIX operating system and on a Microsoft NT 4.0 operating system running on a Pentium PC. In combination with the image data I add overlays of shoreline, hydrochannel delineations, roads, horizontal survey control points, and GPS point locations of field sites within areas of homogeneous habitat type. Overlaying a known GPS location accurate to within 5 meters on the image that has been resampled to a spatial resolution of 16 meters illustrates how well the geographic accuracy of the image features agree with "real-world" coordinates.

Thus far in this project, I have completed the unsupervised classifications to establish habitat differentiation based on computer generated algorithms such as the K-means cluster analysis. I have collected much of the ground truth data needed to perform the supervised classifications, and plan to complete the ground truthing and classified processing after the upcoming low tides. The results thus far indicate that the two species of eelgrass, *Z. marina* and *Z. japonica* are spectrally indistinguishable; however, differentiation between percent cover of the vegetated patches is very apparent. I am currently working on a combination of spectral bands and clustering algorithm that will separate and identify patches of macroalgae, as well as, the invasive seagrass species, *Spartina alterniflora*.

Padilla Bay is an orphaned estuary of the Skagit River. It receives its fresh water input indirectly from the Skagit, Nooksack and Fraser Rivers and directly from streams and sloughs that drain approximately 9,300 hectares of the surrounding Padilla-Bayview coastal watershed. The structural composition of the aquatic habitats is a mosaic landscape of tidal channels, seagrasses, macroalgae beds, and intertidal flats edged by salt marsh vegetation. The eelgrass habitats are critical as breeding and nursery areas for finfish and shellfish fisheries, including salmon, and to migrating birds such as the Black brant. Also, eelgrass habitats function as a detritus-based food chain, provide sediment and nutrient filtration, and are important to sediment stabilization of the substrate.

Worldwide, over the past decade, more than 90,000 hectares of seagrass have been lost. Some of the loss has been due to natural disturbances such as hurricanes, earthquakes, disease, and grazing by herbivores. However, human population expansion in coastal areas is the most serious cause of seagrass habitat loss. Specifically, increasing anthropogenic inputs that alter coastal water quality or clarity through nutrient, sediment, herbicide and/or pesticide loading from upland runoff and sewage disposal are having detrimental effects on the health of important coastal fisheries habitat. The health of coastal aquatic habitats reflects the health of the surrounding watershed. Therefore, mapping and monitoring changes in coastal aquatic habitats is a means of monitoring the health of the contributing watersheds.

The final results of this project will be useful as a baseline of Padilla Bay aquatic habitats as they ex-

isted in the summer of 1996. The processing methods developed for the differentiation of estuarine habitats will provide a standardized procedure and facilitate temporal analysis of the changes in habitat patch size and relative location as well as providing a means to monitor presence and change of invasive species. The final data products will include digital georeferenced image data which has been processed into statistically separable classes of habitat types and percent cover, a digital file which delineates the classes in a vector (vs. pixel) format, point data collected from the GPS, and hard copy maps.

The thesis project and written document are scheduled for completion by December 1998. For additional information I may be contacted at the following e-mail address:
n9435665@titan.cc.wvu.edu

1998-99 FELLOWSHIPS OFFERED

The Washington State Section of the American Water Resources Association (AWRA) is seeking nominations for the 1998-99 school year. Two fellowships each in the amount of \$1500 will be awarded. One fellowship will be awarded to a member of an organized Student Chapter of AWRA in the State of Washington. The other is available to any full-time graduate student enrolled at an accredited college or university in Washington State.

The fellowships are offered to full-time graduate students completing advanced degrees in an interdisciplinary Water Resources subject. In addition to the \$1500 cash award, each fellowship includes a one year membership in both the State Section and National AWRA, a one-year subscription to the *Journal of the American Water Resources Association*, and admission to the Washington State Section Fall Conference.

The general criteria for selection of winning applications include:

- **The interdisciplinary nature of the course of study and research;**
- **The effectiveness of the response in communicating research objectives; and**
- **The potential application of the work to current needs in water resources management.**

Information on how to apply for the fellowship will be mailed to Department Heads of graduate programs that offer degrees likely to involve topics acceptable for the award during the last week in April. The application deadline is September 15, 1998. Most financial aid offices will also receive the information. Alternatively, individuals may request information on the award directly from the fellowship committee chair:

Stan Miller
1329 S. Ferris Court
Spokane, WA 99202
Phone: (509) 456-3604
FAX: (509) 456-4715
e-mail: smiller@spokanecounty.org

Urban Stream Rehabilitation: Optimistic Goals with Realistic Outcomes

By Erin Nelson, UW Student Chapter President

The student chapter of the American Water Resources Association at the University of Washington held a joint social with AWRA State Section members on May 13th at the UW Waterfront Activities Center. The featured speaker was Dr. Derek Booth, director of the Center for Urban Water Resources Management at the University of Washington. Derek's talk, "Urban Stream Rehabilitation—Optimistic Goals with Realistic Outcomes," provided a framework for thinking about the effectiveness of current stream rehabilitation efforts and how those efforts might be better implemented to achieve real physical and biological results. Most stream rehabilitation efforts focus on the channel itself, since this is where the impacts of urbanization and watershed changes are manifested. In-channel improvements are rarely effective over the long-term because the causes of the channel degradation are seldom mitigated. Upland activities such as removal of top soil, vegetation clearing, soil compaction, ditching and draining and increased imperviousness cause hydrologic changes including increased peak flow rates and runoff volumes which have significant impacts on the channel network. However, these upland changes are not usually addressed in stream rehabilitation, often resulting in failed rehabilitation efforts. Derek showed several examples of well-meaning projects that looked beautiful upon completion, but failed to last through one or two years of winter storms.

Stream channel rehabilitation has typically been conducted in isolation from the surrounding landscape. An assumption is often made that physical and biological functioning will follow after the channel structure is corrected. However, the critical changes underlying the loss of physical and biological functions are occurring on the land surface of headwater catchments and the results of these changes will continue as long as they are not mitigated. The social attitudes of people living near urban and suburban streams also have consequences for the biological functioning of these streams. Homeowners tend to "care for" adjacent streams by keeping them clean of woody debris and stabilizing eroding banks. Additionally, people like to see their backyard streams and therefore tend to cut away the riparian vegetation to allow for better views. Neither of these actions benefit the aquatic organisms that live in the stream, but these attitudes are a reality and must be considered.

Derek acknowledged that upland rehabilitation efforts, including "hydrologic rehabilitation," is not an option for most urban watersheds. Therefore, other measures that result in beneficial changes need to be recognized. He suggested limiting sediment loads from hillslope sources and reestablishing

channel grade "stability" as the first steps to recover a stable channel form. Derek cautioned that reestablishing a stable channel form is not equivalent to the dynamic stability of natural systems and will certainly not look or perform like a "natural" channel; however, this is what may be necessary and all that can be achieved in urban settings.

Derek concluded his talk with a set of his own recommended goals for urban streams, as follows:

1. **Address causes, not symptoms**—the most effective rehabilitation efforts must first emphasize the fundamental determining processes, such as hydrology, in disturbed watersheds. Only then can recreation of the structural in-channel features consistent with renewed processes be effectively targeted, including biological activity. Taking this sequence out-of-order is very unlikely to produce biologically meaningful results (although it may support other valid community goals).
2. **Fix past errors and avoid new ones**—Urban channels should not be toxic or lethal to temporary aquatic residents, and they should pose no significant barriers to migration into more hospitable areas farther upstream. Similarly, stream rehabilitation should not make matters worse.
3. **Maintain stable channel grade**—Catastrophic channel failure, with attendant destruction of not only habitat quality but also aesthetic values and channel-bank stability, is most commonly associated with rapid channel incision. There is no adequate "cure" once this has occurred.
4. **Minimize sediment sources**—Geomorphically, this task should be secondary to that of minimizing flow increases, because increased overland flow is the greatest single source of increased sediment delivery, and because increased in-channel flow is the greatest single source of channel erosion (and thus new in-channel sediment). Yet minimizing sediment is generally a far more tractable task than that of minimizing flows, and techniques are more readily and cheaply available to achieve relative success. Even the best results, however, will not produce a channel with a pre-development sediment flux.
5. **Engage the public**—Urban channels are one of the most visible manifestations of the natural environment. An interest to care for that environment, and a willingness to support the broader ecosystem, should arise from how those channels are managed and rehabilitated.
6. **Enhance biological activity**—Regardless of whether self-sustaining wild salmon will ever repopulate the urban streams of the Pacific Northwest, any level of fish use, and the biological activity that surrounds that use, supports both ecological and community goals.

1998 Washington AWRA Fall Conference

Working Title: **“ESA and Water Resources: Compliance and Economics”**
November 12th, 1998 at the Seattle Art Museum

This year's conference will focus on the impacts of the Endangered Species Act (ESA) to the Northwest and what these and related issues could mean to our water management practices. This is more than salmon; recent successes with the ESA have increased awareness and importance of these programs. However, the issues for the Northwest are more complex; this is the first potential ESA listing that will directly apply to and impact urban areas. How does this influence growth management policies and water resource availability? Who should pay for protection of endangered species protection? What are the economic drivers and how we mitigate the impacts? Is the Northwest the venue for debating our commitment to species protection and the ability to sustain urban development?...Can we reach a balance?

The 1997 Fall Conference was well-attended and offered many of us an opportunity to improve our understanding and ability to manage instream flows. This year will offer many more great opportunities to share and discuss new issues!

“The Ancient Egyptian Exhibit” will be on display at the Seattle Art Museum coincident with our conference. (*...Now I forget, were they masters of their water resources?*)

Be a part of the program! We welcome your input and thoughts in preparation of the conference relating to this subject. If you know of a topic or speaker that would make this subject and our conference more meaningful we appreciate you input. Please email you comments and suggestions to:

Gwenn Maxfield at gmaxfield@woodinvillewater.com
or,
Chris Cleveland at ccleveland@brwncald.com

1999 National AWRA Annual Conference

Working Title: **“Watershed Management to Protect Declining Species”**
Seattle, WA, December 4th to 9th, 1999

The Washington Section has been selected to host the national conference of the American Water Resources Association. This is a wonderful opportunity for this region to display our commitment to the preservation, protection and wise management of our precious water resources. We are proud to serve as host and we are confident that we can put on a tremendous conference. However, we can't do it without your help.

Where:	Sheraton and Towers, Sixth and Pike Street, Downtown Seattle
When:	Theme: Watershed Management to Protect Declining Species

We need your assistance in planning for this major conference. Are you able to help:

- *Define the final theme for the conference?*
- *Identify potential speakers that are experts in their field?*
- *Identify others that can help in organizing?*
- *Help with the logistics, field trips? etc.*

We need your help in defining the themes of the conference and putting together a technical program that addresses priority issues. We need your help to identify the major subjects for the concurrent sessions.

Keyword Topics: Salmon Recovery, ESA, Watershed Planning, Tribes, Habitat Restoration, Fish Management, Water Quality, Non-point Sources, Urbanization, Agriculture, Forestry, Stormwater, Water Policy, Water Rights, Instream Flows, Hatcheries, Harvest, Hydropower, Fish Passage, Wetlands, Innovative Solutions, Reclaimed Water, Ground Water Recharge, Interties, Municipal Water Supply, Water Demands, Water Conservation, Water Rates, Watershed Councils.

Contact Rod Sakrison, Ph.D., Conference Chair, at (425) 649-7140, or e-mail RSAK461@ecy.wa.gov

Endangered Species Act Process for Salmon in Puget Sound

Mike Grady, National Marine Fisheries Service

Reviewed by Peter Sturtevant, Harding Lawson Associates

Spring was definitely in the air as over 40 people gathered at the Latitude 47 Restaurant on Lake Union for our April 22 Dinner Meeting. The setting sun shone brightly on the lake and attendees were treated to a preview of the summer sailing season as a result of the nice weather. After a delicious dinner, Mike Grady of the National Marine Fisheries Service (NMFS) in Olympia, gave a very informative talk on the potential listing of the Puget Sound Chinook Salmon and the Summer Run Hood Canal Chum Salmon as Threatened Species. Formerly with the State of Washington, Mike has traveled extensively across the Pacific Northwest spreading the word on the requirements of the Endangered Species Act (ESA) since he joined NMFS last year. This issue moved to center stage in the Puget Sound Region after ESA Listings were proposed by NMFS in late February.

The two species (along with numerous other species in the Columbia River Basin and along the Pacific Coast as far south as Santa Barbara) are defined as Evolutionarily Significant Units (ESUs) whose populations are genetically distinct and specifically adapted to the natural conditions within their spawning river basins. The Puget Sound Chinook run has declined from historic numbers averaging around 690,000 to 240,000 in recent years. The proposed listing, if finalized, indicates that without special protection, the strong downward trend in population levels could endanger the continued existence of this important fish. NMFS has 12-18 months to perform further studies, including public hearings, before a final decision. The affected area includes the 12 Washington counties bordering Puget Sound and the Straits. This proposed listing is considered unique since it would be one of the first to cover a major metropolitan area. As Mike stated, the ESA Listing would require a rapid change in people's attitude and behavior toward streams and the activities which occur within or near them.

Within 6 months of formal listing, NMFS must develop Section 4d rules aimed at protecting the salmon. Among other things a set of prohibited actions will be developed. This could involve a variety of tasks that the federal government has typically not been involved in, including NMFS review of projects within a specified buffer distance of designated streams, prohibition of new water withdrawals from streams declared to have insufficient instream flow, and restrictions on channel maintenance and flood control projects. Mike stressed that there are several approaches that local entities and even private landowners can take to satisfy the require-

ments of the ESA and therefore minimize direct federal intervention.

After a species is listed as Threatened or Endangered, NMFS must develop a recovery plan for the species. The stormwater control and sensitive area ordinances already being enforced by many jurisdictions will likely satisfy many elements of such a recovery plan. The Hydraulic Project Approval process of the Washington Department of Fish and Wildlife is another example. NMFS can review these programs and build them into the recovery plan if they are found to be consistent with species recovery. This allows regulation and enforcement to remain at the local or state level, if they meet the intent of the ESA. Another approach is to develop a Habitat Conservation Plan (HCP) applicable to a specific area or watershed. Once an HCP is approved by NMFS, the landowner or agency may operate freely as long as the provisions of the HCP are complied with. Although the listed fish may be impacted to some degree, the owner is granted an "incidental take" provision. The City of Seattle is developing an HCP which covers its Cedar River water supply, while several large timber companies are developing HCPs for their lands. Mike stressed that a successful HCP must emphasize protection of the entire ecosystem, not just a single salmon species.

A number of regional coordination efforts are underway to comprehensively address salmon recovery. At the state level, the Salmon Recovery Team has been formed to develop ESU recovery plans and to coordinate local response initiatives. Governor Locke's Joint Natural Resources Cabinet is assuring that all the state agencies address salmon issues in a focused and coordinated manner. The three counties of Snohomish, King and Pierce have begun discussions on cooperative efforts for salmon recovery in multi-jurisdictional basins such as the Snohomish Basin. Efforts to boost state and federal funding for stream habitat projects are also underway. It is evident that much work lies ahead. Mike predicted that given the complexities involved, final listing will likely take the full 18 months (August, 1999), with 4d rules and actual federal enforcement taking another 6 months (February, 2000). In the meantime, in anticipation of a formal listing, Mike urged that local governments should begin reviewing their programs for possible impacts to salmon. NMFS is quite willing to work with agencies and to answer questions regarding ESA implications on agency activities. NMFS has begun a series of public hearings to receive public input on the proposed salmon listings. ☛

MEETING ANNOUNCEMENTS

Dinner Meeting Announcement for Wednesday, June 24, 1998

Regional (Tri-County) Planning Response to ESA Listings

Dave Galvin, King County's Endangered Species Act Coordinator
Peter Hahn, Snohomish County Public Works Director

by Fran Solomon, Ph.D., Senior Ecologist, King County Department of Natural Resources

Dave Galvin and Peter Hahn will present an overview of the coordinated response by Snohomish, King and Pierce Counties to the Endangered Species Act and the proposed listing of Puget Sound wild Chinook salmon as "threatened". They will describe the current activities underway in the Central Puget Sound ("tri-county") area, the anticipated form of the regional response and the issues we face which make this one of the region's most complex and important environmental challenges. He respectfully declines to pick the king salmon entree from the evening's menu.

Mr. Galvin is King County's Endangered Species Act Coordinator. He is working within the county's Department of Natural Resources, coordinating internal organization of the county's response to the proposed listing of Puget Sound wild Chinook salmon as well as helping to coordinate regional response efforts among Central Puget Sound counties, cities, tribes and other interests.

Dave is a biologist by training, having done fellowship studies based at the British Museum in London on the use of plants and animals as indicators of pollution. He has worked on various environmental modeling, toxic chemical studies and management issues as a consultant and in various positions within the former Metro and now King County. His experience includes ecosystem modeling along the

West Coast; toxic chemical reduction in wastewater, stormwater runoff and consumer products; control of combined sewer overflows; and small business hazardous waste management; as well as his latest challenge to help recover our native salmon populations.

Plan to attend this very informative dinner. The dinner will be held at the Latitude 47 Restaurant, located on the shores of scenic Lake Union, near downtown Seattle. There is plenty of free parking. Pre-dinner socializing and a no-host bar will begin at 5:30 p.m. Dinner will be served at 6:15 p.m., followed by the presentation. We hope to see you there.

Pre-registration is requested. The cost is \$22.00 for State Chapter Members and \$25.00 for others. There will be a \$5.00 additional fee charged for registration at the door. Make checks payable to AWRA. Send them to AWRA Dinner, c/o Pete Sturtevant, Harding Lawson Associates, 411 108th Ave. NE, Suite 400, Bellevue, WA 98004-5515.

Latitude 47 Restaurant is on the west shore of Lake Union at 1232 Westlake Ave. N., Seattle. Take the Mercer Exit from I-5. Turn north at the Westlake Ave. traffic light. The restaurant is on the right, ~½ mile after the turn. – Or download the map from <http://earth.golder.com/waawra/>.

[Editor's note: Announcements of other organizations are included here. To include your announcement, contact cpitre@golder.com. Links to these organizations are provided through our web page at <http://earth.golder.com/waawra/>.

June 17, 1998: "Dewatering methods used at a construction project adjacent to Boston Harbor." Scott Bender, Shannon and Wilson. Washington Hydrologic Society. E-mail Llyn Doremus at brainwash0@aol.com.

June 26-28, 1998: Western Olympic Peninsula Field Trip. Northwest Geological Society (NWGS). E-mail Steve Grupp at sgrupp@edcc.ctc.edu.

October 20-21, 1998: 1998 Conference on Agriculture and Water Quality in the Pacific Northwest: Understanding Each Other and Working Together for a Better Future: Sponsored by the USGS, Yakima, WA. Conference Mission: To provide a forum for agricultural interests, government, and environmentalists to come together in one place to discuss issues relevant to Agriculture and Water Quality. The intent is to present the different perspectives in a non-confrontational forum and to help each other see and understand the others' perspectives and points of view. Phone: (509) 838-6653 E-mail: farwest@ior.com.

June 6-9, 1999: "26th Annual Water Resources Planning & Management Conference" Tempe, Arizona. Call for papers (due Aug. 1, 1998). American Society of Civil Engineers <http://water99.asce.org>.

1998 Membership Application / Change of Address Form

(⅄ please circle, as appropriate ⌘)

Annual membership in the state chapter costs \$25.

(If you attended the 1997 Fall Conference, you are already a member for 1998 – Welcome!)

Name _____ Position _____ Affiliation _____

Street Address _____ City _____ State _____ Zip _____

Phone(_____) _____ Fax(_____) _____ E-mail _____ @ _____

Check if you would like to be actively involved on a committee during 1998.
You will be contacted to determine what committee involvement you would like.

1998 Membership Dues (through October 1998): \$25.00. **Checks only.** Please make check payable to **AWRA Washington Section.**

Mail to: AWRA, Washington Section
c/o Mike Wert, Shapiro & Associates
101 Yesler Way, Ste. 400
Seattle, WA 98104

The American Water Resources Association is a scientific and educational non-profit organization established to encourage and foster interdisciplinary communication among persons of diverse backgrounds working on any aspect of water resources disciplines. Individuals interested in water resources are encouraged to participate in the activities of the Washington Section.

Special thanks to Golder Associates Inc. for word processing and graphics support on this newsletter.

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