



February 10, 2010 Meeting Notes
Dungeness River Management Team
Dungeness River Audubon Center
Railroad Bridge Park, Sequim, WA
2:00 – 5:00 P.M.

Notes prepared by: Melissa Coughlin

Team Members/Alternates in Attendance:

Steve Tharinger, Clallam County
 Cathy Lear, Clallam County (alt)
 Cynthia Nelson, WA Department of Ecology
 Scott Chitwood, Jamestown S'Klallam Tribe
 Shawn Hines, Jamestown S'Klallam Tribe (alt)
 Virginia Clark, Dungeness/Quilcene Planning
 Al Moore, Riverside Property Owners (RM 0-3.25)
 Bob Caldwell, Dungeness Water Users Association

Tom Martin, Clallam County PUD #1
 Robert Brown, Dungeness Beach Association
 Michele d'Hemecourt, NOLT
 Michael Blanton, WDFW
 Don Hatler, Sports Fisheries
 Joe Holtrop, Clallam Conservation District
 Frank Needham, City of Sequim
 Judy Larson, Protect the Peninsula's Future

Others in Attendance:

Robin Berry, Graysmarsh
 Hannah Merrill, Clallam County
 Ann Soule, Clallam County Environmental Health
 Liz Maier, Clallam County Environmental Health
 Belinda Pero, Clallam County Environmental Health
 Andy Brastad, Clallam County
 Ann Seiter, Consultant
 Robert Crittenden, Citizen
 Phil Martin
 Dave Leroux
 Helen Watkins, 30 year resident

Elizabeth van Sickle, Property owner/Resident
 Steve Rankin, Streamkeepers
 Amanda Cronin, WA Water Trust
 Connie Beauvais, Crescent Water Association
 Powell Jones, Dungeness River Audubon Center
 Welden Clark, Dungeness River Audubon Center
 Bruce Emery, Green Crow
 Harry Bell, Green Crow
 Melanie Roed, interested individual
 Marguerite Glover, Sequim Association of Realtors
 Melissa Coughlin, Independent Contractor/note-taker
 Mike Kitz, PUD

2:00 P.M.

I. Introductions /Review Agenda / Review and Approval of January 13th DRMT Draft Meeting Notes

- Steve Tharinger called the meeting to order. Introductions all around.
- Agenda was reviewed: Steve remarked that the agenda consisted of presentations on 2 items focusing on instream flows and Rule plus mitigation exchange. Cathy Lear requested adding a quick introduction of the public participation plan for the Clallam County Shoreline Master Program update to the agenda.
- Reviewed January 13th DRMT meeting notes. Virginia Clark moved to accept notes, Frank Needham seconded motion. Robert Brown remarked that Hansi Hals' comment that the spot had been vandalized was missing – and remarked the project was OBE (overcome by events). Tom Martin: wanted to add to the first bullet on page 6, he said he had asked the follow up question, "would economic impact analysis be evaluating the effect of the Rule on land values" (as well as the cost of water that was captured). No other corrections were made and the minutes were approved with changes from comments above.

Public Comment:

- Cathy Lear handed out copies of the document, "Clallam County Shoreline Master Program Update Public Participation Strategy DRAFT (Public Participation Opportunities Related to the Update of Clallam County's Shoreline Master Program) and introduced Hannah Merrill. Hannah explained the importance of getting public input for the topics: characterization, what's going on, what's the access of the shoreline. Attempt to reach out to the public is outlined in draft. Map on the back of document is easier to read on the County's website (<http://www.clallam.net>). After finalizing the draft the County Commissioners will adopt in early March. Please get any comments back to Hannah.
- Don Hatler brought attention to the new exhibit at the Dungeness River Audubon Center: an aquarium with salmon eggs that will be hatching soon. The exhibit is the outcome of a collaborative effort by the Puget Sound Anglers and the Washington Department of Fish and Wildlife. 500 Coho eggs from the Hurd Creek Hatchery are expected to hatch in the next couple of weeks and then will be returned to the river.

- Robert Brown announced (to following up from last meeting) the Oyster House is no more. The road remains and he wondered if there are any plans to change the name from the Oyster House Road. He also mentioned being at the River's End Road during some high water and noticed a little bit of flooding there.
- Judy told the group that the second lecture in the Feiro Marine Life Center lecture series will be on Saturday, February 27th at the Feiro Marine Life Center (on the waterfront pier in Port Angeles - 315 N. Lincoln Street) at 3:30 P.M. "Bridging the Hemispheres: Challenges and Opportunities for Conserving Highly Migratory Seabirds", will be presented by Dr. Peter Hodum, the director of Juan Fernandez Island Conservancy in Chile and a visiting professor at the University of Puget Sound. Judy suggested that Shawn send out an e-mail reminder and that people at the meeting will disseminate this information to their group's members to help make this a success for the Center that works to preserve marine environment.

II. Dungeness Mitigation Exchange Update – Cynthia Nelson, Washington Department of Ecology, Amanda Cronin, Washington Water Trust, Ann Soule, Clallam County

- Cynthia began by saying the mitigation exchange is part of the overall Rule making package. The Rule is based on many of the recommendations from the 2005 watershed plan and studies that were done during the Dungeness-Quilcene (DQ) planning process. The instream flow level parameters were set using the 1994 studies and Watershed Plan. The instream flow rule will not affect any senior water rights; only those issued after the Rule is in effect, and have nothing to do with putting water "back" in the river. The rule will affect junior rights (any water rights obtained after the rule is in effect); it integrates water availability in consideration for establishing new water rights. In the summertime, water availability is low. In developing the Rule package minimum flows are established and mitigation will be required for new uses of water. Mitigation is a separate and related package in the form of a Dungeness Water Exchange. It will be the method for people to offset their affect on river. MOA with Clallam County and Washington State Department of Ecology is being developed to describe responsibilities in carrying out water management according to the rule. A guidance document will also be developed to help all involved easily understand the various components of the water management package.
- Robert Brown asked with regard to water metering on junior right: how will the data be collected and what is the data going to be used for? Cynthia answered that the statute for metering has been on the books since the early 1990's. It states that anywhere salmon stocks are listed as depressed or critical all new water uses should be metered. The statute is retroactive to surface water. Requirements will be considered on a Rule by Rule basis. The data may be collected by remote reads for minimal obtrusion. As part of the functioning mitigation exchange there will be metering. Details about how the requirement will be implemented are still being worked out.
- Amanda Cronin gave her presentation on the potential framework for the Dungeness Water Exchange. Washington Water Trust is a non-profit organization that works statewide. They have set up water banks around the state. Hired in 2008 by DOE to asses feasibility of setting up a water bank for the Dungeness. Currently they are in stage 2 of the project. Phase 1 accomplishments: Interviews and research conducted: August – October 2008; Draft of feasibility study to DOE: October 4, 2008; Convened technical group to discuss restoration priorities: Notes distributed Dec 2008: October 16, 2008; Water Exchange Strategy and Design draft report to Ecology: December 5, 2008; Presentations and participation at DREC, DRMT, WUA meetings: September 2008-present; Mitigation Calculator created (1st draft Oct 2008): March 2008 to DOE; Leasing program commenced: February 2009; Submitted additional proposals to fund water exchange work (Ecology w/ Clallam County and (BOR grant): December 2008 – June 2009.
- Created a draft mitigation calculator to figure out mitigation people would be responsible for. Worked with irrigators in program where they were compensated for not irrigating to determine loss. Looking for funding sources this year for water exchange (BOR grant). Goal is to have the mitigation up and running by the time the Rule is in effect, so process is clear and easy for those wanting to drill well and find mitigation.
- **Water Exchange Institutional Design:** As envisioned, exchange would handle both restoration and mitigation. Washington Water Trust could provide initial exchange services under Ecology-County MOA and as per Rule. Exchange could evolve into a Washington Water Trust subsidiary or a new non-profit organization depending on volume and time frame for transactions.
- **Exchange Guiding principles:** Respecting the Water Users Association, irrigation district and ditch company rules and regulations; Acquire water rights only from willing sellers; Avoiding impairment of other water right users; Leasing and transferring only water that was previously diverted and used ("wet" water); Addressing and where necessary mitigating for any additional and significant third party impacts.

- **Water Rights Acquisition:** Outreach and Extension; Transaction Development; Due Diligence; Negotiation; Pricing; Financing/Cost-Share; Transaction Implementation; Contracting; Water Rights Administration; Monitoring and Reporting.
- **Authorities for the Exchange:** Rule: Sole exchange in the watershed as authorized as in Rule and Ecology/County MOA; Exchange authorized to receive mitigation payments and issue payment certificates; Ecology/County MOA; To specify functions and operations for mitigation in Exhibit on Guidelines; Specify contract and time frame; Lay out governance/accountabilities.
- **Accountabilities:** Under MOA a Review Board is created:
 - Role
 - Annual Program and work plan review & approval
 - Restoration and Mitigation Programs
 - Adding others over time
 - Quarterly (?) review of transactions, income/expense and capital/water balances
 - Annual Report on Exchange
 - Membership
 - Leadership
 - Decision-making
- **Process for acquiring mitigation:** New homebuilder goes to the County for building permit; County directs them to the exchange; Based on the location of their parcel and the depth of their well, the exchange staff can easily tell them what their mitigation obligation will be (in acre feet and \$); New homebuilder writes one time check to the exchange and receives mitigation certificate, once meter is installed.
- **Mitigation calculation model:** Calculates mitigation obligations for expected new groundwater rights and exempt wells; Calculates mitigation credits for expected mitigation credit transactions: Critical Period during Irrigation Season: Partial season lease/transfer; Full season lease/transfer; Critical Period outside Irrigation Season; Shallow aquifer recharge (SAR). The calculator employs user input about a new well and Ecology look-up tables to run calculations that provide a mitigation obligation in AF of water and dollar cost.
- **Mitigation Calculator Summary:** Changing Trading Ratio just increase mitigation cost - in a linear fashion; Mitigation costs increase considerably when outdoor use is allowed; Mitigation costs are costs for water and transaction costs; Transaction costs are inevitable.

Discussion during slide presentation:

- Amanda walked through the calculator process (see charts from the PowerPoint presentation that accompany these notes) with specific examples, although the numbers have not been finalized.
- After the Rule is in effect, if homebuilder can't hook to City, PUD or a class "A" system they can drill a well. With the mitigation and Exchange up and running the homebuilder will write a one-time check, install their meter and are good to go. Robin Berry asked how it will be determined how much water well will use. Amanda explained that the homeowner may have options to choose from: indoor only, indoor with some outdoor, and both.
- Marguerite Glover was concerned about the small sub-basins (like Bagley Creek); if someone is allowed to buy more water, someone down the line will have no water. Amanda said that will not be an option. Through the policies and procedures of the Exchange the water will be equitably distributed. Steve Tharinger said they are talking about the reserves being based on public need with focus on residential or domestic (working terms) use. People in household get the water they need for living in the home, while agricultural, business use would have to use mitigated water. Marguerite was concerned someone wanting to water fruit trees for their own consumption wouldn't be able to. Amanda explained that person could water the trees without using 5,000 gallons a day to do that. Rainwater is also an option for outdoor watering.
- Amanda said that they are determining ways to benefit the river during the critical July – November timeframe. Looking at possibilities for recharge and programs to maximize restoration.
- Reviewed the calculator elements: plug in indoor and outdoor needs, well depth and well location, type and quantity of use to predict the impact to Dungeness River and streams.
- Marguerite Glover asked if you can actually limit the amount of water people use inside their house. AGO (Attorney General Opinion) determined that couldn't happen.
- Steve Rankin asked about a hypothetical homebuilder essentially lying about use, says indoor only but waters his lawn. Or when a house is sold, what if the new owner wants different water quantity option. Amanda said that the policies and procedures are connected to the deed so that the water descriptions are clear to the next buyer. DOE is responsible for regulation. DOE doesn't have any staff here, locally. You will be required to

meter, monitoring program may begin through the Exchange. Cynthia said the DOE is not looking at limiting use per day. Assumptions have to be made based on the information and averages we have.

- Shawn Hines was confused about the difference between the reservations and the maximum impact amounts. Steve Tharinger said he thought of it like a bank. Reserves (based on the overriding public concern) will exist so that people will have access to drinking water, deposits exist in the Exchange for that reserve. Reserves are not limitless and are based on overriding public concern. Amanda said if you sign up for 200 gallons/day you are not responsible for the consumptive portion of that.
- Al Moore asked what is to stop someone from paying for \$1,000 mitigation and then using as much water as they want. Amanda said that theoretically water use would be recorded by metering. There is no strict regulation in place. Neighbor may inform DOE that you are over-using. The idea is to inspire people to conserve water. The administration cost of daily monitoring would be prohibitive. Some areas are served by irrigation districts and serve senior water rights which are not affected by Rule anyway. Amanda said they are working with some irrigators on alternatives to make sure water goes to highest valued crop (but can't tell them what they can and cannot do). Steve Tharinger talked about the separation between flow mitigation and flow restoration. Trying to limit the amount of surface water that is used falls into restoration category.
- Robert Brown asked if the calculator took into consideration areas where there was no impact to the Dungeness River. Amanda explained there were geographic impact zones, but there are no areas with zero impact, even coastal areas showed some impact, however small according to hydrogeologists who set up the model.
- Tom Martin talked about the Carlsborg UGA as a specific example to look at both sides of mitigation/restoration obligation: In the Carlsborg UGA a large tract of land (was growing hay) was served water by an irrigation company. If that was converted from a hay field to high density housing with low outdoor usage, from the mitigation calculation standpoint they would come to mitigation cost. But what about the retirement of irrigation on that farm, does that count as restoration? Amanda said potentially yes, but that the land owner couldn't sell the water rights when they sell the property because those belong to the irrigation districts (they own the rights). If the irrigation district agrees to it and says they'll take this out of their service area and deduct it from their wet water rights, it could become part of restoration or efficiency projects. Don Hatler asked who the money would go to in that instance. Amanda said the irrigation district. In a similar situation last year it went to the farmer leasing the land, in exchange for a specific number of cubic feet that would not be removed from the river.
- Robert Brown asked if someone originally wanted the 5,000 gallons/day and then changed to domestic use only, would money be refunded to them. Amanda said probably not, it is a one-time fee for mitigation; potentially they could have a program to address refunds for people significantly lowering usage.
- Marguerite Glover asked if people were allowed to sell their Clallam Ditch shares to the water bank. Yes, with approval they can sell Clallam Ditch shares to the water exchange.
- Steve Rankin wondered how a house buyer would know what water usage the builder purchased when building the house. Amanda said the courthouse would have the information and it should be on the title.
- Steve Tharinger said the DOE sees monitoring as a measurement tool to see how much water is actually being used, which is useful in mitigation and reserves management. Enforcement part is problematic.
- Robin Berry asked about the mitigation ratio assigned in the calculator model. It seems arbitrary and the larger you make the ratio the less mitigation you have to sell. She thought it made sense to pay for the water you use, but not pay for two or three times the amount used. Amanda said that is why a low ratio is recommended, and suggested that flow restoration could happen within other venues. Cynthia said they are looking at 1:1.5, but aren't planning to go over that. Steve said according to the Rule there will be an exchange, the number will be plugged in, and that will be in the MOU. We're going through all this so that people can get water. Water is owned and managed by the state.
- Don Hatler asked about the mitigation bank in Oregon that was discussed a while back where the model was based on a market value for water traded back and forth. Assigned a bottom line number, is there a price based on some marketable factor? Amanda said there is not an active water market here. The Deschutes water bank was set up on economic estimations based on best guess estimate of what you can buy water for, not a lot to compare. Last year there was a reverse option - an open invitation to bid and took the lowest bid. Tom Martin asked what the price was for water in that case. Amanda said Ecology paid \$80/acre for farmers to stop irrigating for one month.
- Judy Larson asked if the economic impact analysis for the Rule will show a range. Cynthia replied the detail of the exchange in the Rule itself wasn't yet clear.
- Visit DOE website to keep informed: <http://www.ecy.wa.gov>

III. Dungeness In stream Flow Incremental Methodology Refresher, Brad Caldwell, Washington DOE, Hal Beecher, WDFW

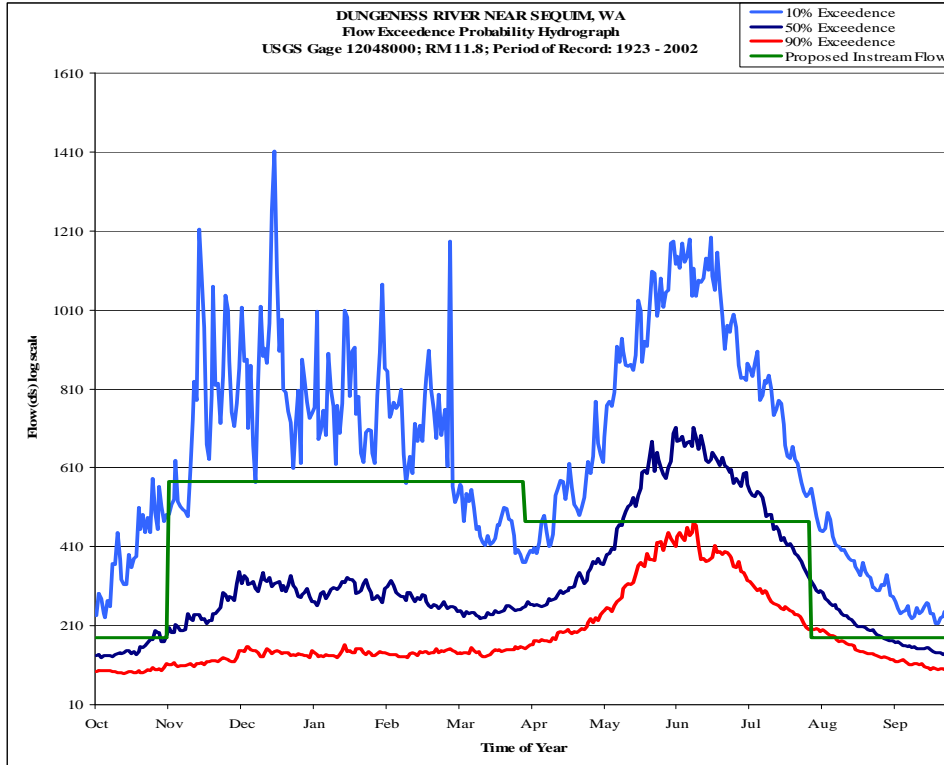
Hal Beecher, WDFW, gave the following presentation:

- **Purpose of In stream Flow Studies:** Identify flows that provide good habitat; Identify relationship between flow and fish/habitat (incremental); Relate flows to natural hydrology, temperature, life history.
- **IFIM (Instream flow incremental methodology) / PHABSIM: (Physical HABitat SIMulation)**
- **Biological basis of instream flow for fish:** Coho salmon – higher summer flow → more fish; lower summer flow → fewer fish – consistent pattern along Pacific coast: - depth and velocity predicts where young Coho are in a stream; Steelhead – higher summer flow → more fish; lower summer flow → fewer fish - depth and velocity predicts where young steelhead are in a stream; Thus, IFIM/PHABSIM addresses an issue that **MAKES A DIFFERENCE**. It is based on area having depth and velocity criteria that appear to be important in habitat selection.
It has been shown that instream flow makes a difference. Consistent pattern of more fish with higher summer flows. This has been verified at Morse Creek.
- **Rearing Habitat:** Basic living space – volume (depth, width); Current to transport food – trade-off with energy use in swimming; Cover (crevices, wood, boulders, shear zones, surface turbulence).
- **Research on flow and habitat needs:** Multiple studies since 1940s: higher average flows and summer flows → more Coho salmon, steelhead. Olympic Peninsula studies: using depth and velocity preferences for juvenile steelhead, Coho, and Chinook, we correctly predict where fish will be in a channel segment within armspan.
- **Spawning Habitat:** Gravel – spaces for eggs & water; Current - fast enough to oxygenate & flush waste, not so fast adults can't swim, not so fast as to scour. Depth - deep enough for adult fish to be covered.
- **Incubation Habitat:** Where fish spawned - Suitable incubation conditions for duration of incubation – EGGS CAN'T FLEE: too fast → scour → lost, too slow → sedimentation → smothered.
- **Elements of IFIM/PHABSIM study:** Selection of study site(s) – criteria (representative vs critical)
 - Channel shape – select measurement points, survey bed elevations
 - Hydraulics – depth (water surface elevation survey, depth measurement) and velocity
 - Hydraulic modeling – distribution of depth and velocity in relation to each other and bed features
 - Habitat modeling – evaluate where conditions (depth, velocity, substrate/cover) are most suitable for fish
 - Interpretation – evaluate results in terms of hydrology, temperature, other abiotic factors, life history and ecology; develop recommendations
- **Selection of study site(s) – criteria:** Identify segments of stream that are similar (repeating units): Flow; Gradient; Sinuosity; Bed and bank type; Human modifications; Where will water management actions affect the stream? What are critical reaches for fish production and life history? Where is (or can be) gaging to measure compliance?
At Greywolf there won't be variables that affect, further downstream there are.
- **Channel shape – select measurement points, survey bed elevations:** Transects (usually 5-15) with regular measurement points (10-50 per transect) – approach used by Ecology and Fish and Wildlife. Survey bed and bank elevations relative to a fixed benchmark
- **Hydraulics:** Hydraulic measurements (depth, velocity, water surface elevations) taken at 3 or more flows as input to calibrate hydraulic model:
 - High flow (typically in spring, ~4x low flow)
 - Medium flow (typically early summer, ~2x low flow)
 - Low flow (typically late summer-early fall)Measurements are always taken at same transects. Go out to same place to measure at every flow.
- **Hydraulics – depth (water surface elevation survey, depth measurement) and velocity:** Survey – water surface elevation at each transect relative to benchmark at each calibration flow; Measure depths and velocities at fixed points on transects at each calibration flow.
- **Hydraulic modeling – distribution of depth and velocity in relation to each other and bed features:** Using hydraulic data to calibrate model, predict depth and velocity distributions at different flows.
- **Habitat modeling – evaluate where conditions (depth, velocity, substrate/cover) are most suitable for fish:** Computer model accounts habitat value at each flow. It does so through an index of habitat: Weighted Usable Area (WUA)
- **Habitat Modeling:** Based on Habitat Suitability Criteria – for Dungeness we measured habitat used by fish and compared it to what they had to choose from to identify relative habitat preferences.

- **Habitat modeling – WUA:** Suitabilities for Depth, Velocity, Substrate/Cover are found in Habitat Suitability Criteria – see Ecology website: <http://www.ecy.wa.gov/programs/wr/instream-flows/isfsci.html>, then click on Instream Flow Study Guidelines: Technical and Habitat Suitability Issues. For each measured point in the channel, at each flow of interest (not just calibration flows), computer assigns WUA_{cell} that is calculated as: $WUA_{cell} = Area \times Suitability(Depth) \times Suitability(Velocity) \times Suitability(Substrate/Cover)$: $WUA_Q = \sum_Q (WUA_{cell})$. Habitat modeling evaluates habitat quality. Unit for measurement is square feet of habitat per 1,000 feet of stream.
- **Interpretation:** Evaluate results in terms of: hydrology, temperature, other abiotic factors, life history and ecology; Develop recommendations or impact assessment.
- Studies in the Dungeness included snorkeling to find fish, discover the choices fish have in the area, and which of those fish were choosing. No fish were found at 3' of water; full of fish in ½' of water. Did that sort of study with velocity as well.
- Al Moore asked if you had the model in hand, could you go out at any given time, go to a spot, would it be able to tell you fish are there? Hal responded that it hasn't really been used for adult fish holding, (has been for spawning), Steve Tharinger said it wasn't a tool to tell a fisherman where to fish.
- Hal said one of the criticisms of the approach is it looked at a specific spot at one time, not accounting for the many variables. Measurements occurred in the summer during low flow, when it was easier to get into the river (and wasn't as cold). Found that when the snow was coming off the mountains and there was more water the model was still good at predicting over a wide range of flows.

Brad Caldwell, WDOE, gave his presentation:

- History: This all started with the Dungeness River Management Team, which originally formed around 1987, they wanted to have an instream flow study.
- **Definitions: Instream Flow:** It's a legal term. The instream flow number is set to inform new water diverters when they can begin taking water out from the river. The instream flow has to be high enough to fully protect the fish and fish habitat from new diversions. **Streamflow:** It's the quantity of water flowing down a stream.
- A minimum instream flow is not the minimum amount of water that will be left in the stream for fish. Why? Ecology cannot affect existing water rights. We cannot make someone with a valid water right put water back in the river to help fish.
- One method commonly used in Washington to determine the streamflows needed for salmon and trout spawning and rearing is: **IFIM (Instream Flow Incremental Methodology)** It calculates how much fish habitat you gain or lose as you increase or decrease the streamflow.
- **Dungeness River Instream Flow Study:** Approach was to use Physical Habitat Simulation (PHABSIM) models of Instream Flow Incremental Method (IFIM) because it addresses life-stage-specific details of habitat 1988-1989. Study was conducted by U.S. Fish and Wildlife Service (Hiss & Wampler). Assistance from Ecology (Caldwell), Wildlife (Beecher & others), and Fisheries (Bruya and others).
- Two sites were selected and proceeded to characterize stream bed and banks. Multiple transects to represent habitat types. Fixed points (on transects) characterized by substrate and relative elevation (surveyed).
- Link for flow studies: http://www.clallam.net/environment/assets/applets/R2_Habitat_Tech_Memo_5-31-07.pdf
- Charts were displayed: Predicted WUA of habitat for Coho, Chinook, and pink salmon, from the combined models for the lower study site, river mile 2.3.
- Members of the instream flow group which met in 1992 and early 1993 were from the Jamestown S'Klallam Tribe, National Marine Fisheries Service, Washington Department of Ecology, Washington Department of Fisheries, Washington Department of Wildlife, and the U.S. Fish and Wildlife Services.
- "Timing of salmonid spawning, rearing, incubation, and smolt outmigration": Chart of Bull Trout, Cutthroat, Steelhead, Coho, Chinook, chum and pink salmon, life stages (spawn, incubate, rear) and months were shown. No one flow can be optimum with so many species and lifestages.
- "In stream Flow for River Mile .5" River flows by month with overlaid proposed instream flow was shown.
- Al Moore asked the timeframe for the data in chart (below). Brad said data is from 1923-2002, and the chart is showing exceedence flows (e.g. the red 90% exceedence flow curve shows the flow values that are exceeded 90% of the time). Peaks show rain in the wintertime and that snow is melting in the summertime.
- Harry Bell remarked that looking at October and the green instream recommendation, it looks like about 75% exceedence of the flow. Brad said it tells you fish can use all the water if it's there. Chart allows DOE to figure out if there is water available to issue water rights.



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- Confusion on paper water rights ensued. Brad used Lower Walla Walla River where they do take all the water as an example: Flow would be zero. It is more theoretical than real. Cynthia explained once again that there is no obligation to meet the instream flow number. It is not the target flow to be met, it is in place to ensure there will be water in the future. New wells will be allowed with mitigation.
- Resulting Dungeness Flow Recommendations:

Table 2.8-14. Recommended Monthly Flows vs. Monthly Exceedance Flows

Month	Recommended Flow	Percent of Time Flow Not Met ¹	Exceedance Flow at USGS Gage (cfs)		
			90%	50%	10%
January	575	14%	150	360	640
February	575	15%	190	330	630
March	575	19%	190	250	410
April	475	3%	220	360	420
May	475	0%	400	560	800
June	475	0%	460	710	1000
July	475	<1%	300	510	730
August	180	21%	180	270	370
September	180	62%	140	180	250
October	180	58%	120	190	360
November	575	21%	150	270	550
December	575	14%	200	370	680

1. Percent of time half-monthly average flows are less than recommended flow.

Source: Hiss, J. (1993b); reaffirmed by DRRWG (2002).

- Flow numbers jump around a lot, discussed for two years how to blend the numbers. 90% of the time in August there is more water than 180 cfs, not asking for more flow than what is there.
- In addition, in 2003 the Tribe and BOR did a study on side channels. Documented where the all the side channels begin and end and what kind of habitat was there.
- 2005 the Watershed Plan was adopted. Instream flow was approved in writing.
- 2007: In another analysis Ron Campbell asked how the habitat in the side channels and mainstem may be affected by aquifer recharge.
- See graphs in PowerPoint presentation (on the DRMT website) for flows 1999-2006 at river mile 11.8. Judy Larson asked how many years of data are in that chart. Brad responded 7 years of daily recordings for river mile 11.8. Lower trend in last few years.

- **Goals of the Dungeness Study:** Determine how native salmonid habitat responds to flow in lower reaches of Dungeness River. Assume that flows limit habitat directly during spring, summer, and fall, when demand for flow is greatest.
- **Characterize stream beds and banks:** Multiple transects to represent habitat types. Fixed points (on transects) characterized by substrate and relative elevation (surveyed).
- What other information besides a fish habitat study is needed to develop an instream flow? A hydrograph will tell us how much streamflow has existed in the stream.
- Harry Bell said there was a big event in 1999, which had to have made changes in the river. He wondered from the standpoint of the sites selected and relative to the history in the river of heavy debris removal, more river movement, shallower water, fewer pools and riffles, may be looking at a different picture of what the instream flow should be. Brad said the study from 1988 it was 2,000 -3,000 cfs all the time. Haven't seen that much big change. The river is dynamic. Harry asked that if the efforts to re-establish large woody debris and meandering in river is successful, what will instream flow mean to fish - would it change? Brad said perhaps over time if it changed the river. Now there are side channels which make higher flows, don't see going away, don't see river going into a narrow channel.
- Tom Martin said Harry brought up an interesting point of changing morphology over time. Aggradation was brought up in the lower reach when you were doing the study, maybe overtime that would make side channels higher in elevation than the streambed at that time, because of lots of deposits. I didn't see a cross-section of the channels, it would be interesting to see how high these channels actually are and how much flow it would take to get up that high and sustain enough of a flow to prevent eggs from drying. Brad said that was a big factor: don't want to have the channels high for a brief amount of time; flows typically drop by July when the eggs are hatching out. If fish are going to spawn in the side channels there has to be enough water to sustain. Cynthia said the study; "Physical Characterizations of the Lower Dungeness" is available on-line either on the County's site or on the DOE website.
- Scott Chitwood said the U.S. F&W Service study from 1991 and 1993 was used in the Watershed Plan to develop flow. Cynthia remarked the river hadn't changed enough to warrant another study, from DOE's perspective.
- Steve Tharinger thought the difference between stream flow (water term) and instream flow (legal term) confuses people enough to cause a disconnect with people. Instream flow is used to determine policy.
- Brad concluded that instream flow study comes up with a number to protect spawning and rearing and not necessarily what the water management will be. Helps determine when people can take away water. 1971 Water Resource Act happened because water was drying up, fish populations were decreasing. Legislature told DOE to go out and protect what was out there. Needs to stand up in court, have to show judges a methodology which was followed. Need to pick number for instream flow that fully protects fish. Cynthia said there have been 4 ESA listed fish on the Dungeness and low flow in the summer is one of the most limiting factors for recovery and needs to be addressed. The water conservation efforts and irrigators cooperation have helped with this recently. There have been significant savings already, so one thing we're looking at with the mitigation exchange is to transfer a fraction of the existing irrigation rights (while protecting agriculture) to the exchange.
- Steve Tharinger said we need to provide mitigation for consumption and restoration. Need tools to manage lack of water. Need to manage water more effectively. Also need to develop these tools for predictability to give us access to water.

IV. Other Business / Announcements

- Robert Brown recalled that last year the Tribe had a construction project on the Dungeness and asked if there had been any evaluation of any outcome of project. Steve said there can be an update on the log jam project on an upcoming agenda.

Public Comment

- None at this time

V. Meeting Adjourned at 5:00 P.M.

Handouts:

- "Clallam County Shoreline Master Program Update PUBLIC PARTICIPATION STRATEGY DRAFT (Public Participation Opportunities Related to the Update of Clallam County's Shoreline Master Program.
- Flow charts from Amanda Cronin's presentation: Water Exchange: Flow Restoration and Groundwater Mitigation will be sent with these notes.
- PowerPoint presentations by Hal Beecher and Brad Caldwell will be available on DRMT website.