

Christine Moffit, Chris Peery, Stephanie Hampton, Kerry Reese, (Brian Kennedy interest)
Steve Achord Rich Zabel, John Ferguson, Tracy Collier, Beth Sanderson, Phil Roni,
Chris Codel RAUF, Jim Congleton, Paul Janssen IDFG McCall (watershed processes)
Dennis Scarnecchia

10/15/04

UI - NWFSC meeting to discuss Collaboration on Freshwater Ecosystem Research

Steve Achord Monitoring the migrations of wild Snake River spring-summer chinook salmon juveniles

- migration timing & survival @ L. Granite Dam
- 17 stream collection sites + Oregon GRR streams.
- 1991-2003
- Big Creek highest survival rate of 17 sites
- Density dependent survival by year: highest 1998, lowest 2003
- Big Creek one of earliest migrating fish
- mid april - mid june 45 day migration for wild fish mid apr - mid may for hatchery fish @ L. Granite
- Water monitors (hourly) - 6 at fish traps - want to incorporate w/ climate data (pH, conductivity, depth, temperature, turbidity, DO)
- Developing in-stream monitoring of pit tagged juv salmon @ Valley Creek 10' x 20" Night time migration, 50% detected in Aug, but also thru fall/winter

BIG CREEK DRAINAGE - INTERESTS

Red counts 60-71 upper 123, lower 126 1972-88 25 & 15, 1989-97 20 & 5 1988-2000 upper 13 / 13, 2001-2003 upper (114), lower similar

- Want to expand in-stream monitoring to TRFS. Advantages: NWS weather slr, personnel/access to install gear, monitor biology of salmon (and steelhead) (& cutthroat, bull trout, whitefish), ecosystem studies - nutrient, productivity, climate change (pit tags 2-3" to detect but new supertags 16-18" detect distance) 2 sites for monitors to know direction of movement - multiplex

John Ferguson - Collaboration interest as result of TRFS trip in August
Want to get more into freshwater ecology. Share Steve's data for long term (30-100 yr) usefulness.

Rich Zabel - Estimating Parr-to-Smolt Survival (Spawning/rearing stream → overwinter → Migration → L. Granite Dam)
Zabel & Achord 2004 Ecol 85: 795-806 Fish size as a measure of habitat effects on survival? Fish size from physical habitat, predators, competition, nutrients.

Zabel continued

Fish size: 1) Fork length 2) Fish condition index (diagrams)

Fat or thin fish not related to survival of individuals.
Mean length ^{popl or year} weakly related to survival (except L Big Cr = 2000' elev lower than other sites). Strong within popl effects of length vs survival. Brook trout streams have lower salmon smolt survival & no increase survival w/incre hab Q like non brook trout sites.

Future Directions: ① Life Cycle Modeling - Importance of parr to smolt survival to popl viability ② Climate effects & climate change (decreased ^{50%} snowpack w/global warming) ③ Growth - otolith analysis, ^(lab) fecundity

Beth Sanderson - Assessment of Nutrient Enhancement

in Columbia R Basin (salmon carcasses analogs, nutrient pellets, carcasses)

Has reduction of marine nutrients in Salmon R affected salmon popl.?

- 19 streams
- Behavioral studies - feeding, habitat use, interactions
- Experimental studies in enclosures on nutrients

DATA

Rush Cr high ^{very} in nitrate & Phosphate, Lower Big is moderate Nitrogen limited on all streams but Rush Creek (Loon)

P limited on all streams but Rush

N¹⁵ stable isotope from marine source - measure signature on other organisms: Lower Big & Rush are on higher end of % N¹⁵ but upper Big is way lower than all other popl. (Genetics show the 2 Big Cr sites may be different genetically)

N¹⁵ neg correlated or no correl. w/ size (length)

Intriguing obs at Lower Big Creek

- Interesting nutrient concentrations on Rush (N & P not limited)

Stable isotope values not related to fish size

Differences between to lower & upper Big & Q about fish movements

Phil Roni Watershed Program - freshwater ecology
1) Ecosystem processes, 2) Recovery Sci/Landscape Ecology
3) Restoration effectiveness

Most projects in W Washington, but Beth S' nutrient project is under this program

Future direction possibility @ Big Creek

- 1) Freshwater survival related to habitat Q
- 2) Long term monitoring ^{Need} - water, ^{sites} productivity, fish survival ^{stream}
- to address global climate change - NOAA ^{some} funding
- Big Creek could be one of those
(ODFW Smith Creek ^{Impiqua} site is only comprehensive monitoring site ^{now})

UI Stephanie Hampton - Invertebrate Ecology (Communities & algae)
Zooplankton - community time series analysis - species Δ over time
- multispecies autoregressive models - Ecoinformatics
Paleo. work - benthic samples Food webs
Question to us on Anchor Ice & fish movements & potential effects of climate change

UI Dennis Scarnecchia - Fish Ecol, Popl Dynamics, Large rivers & reservoirs, Salmon Ecol - Atl. Salmon. Bull trout grad students
- migration on Secesh John F asked Dennis his ^{TRFS} interests/ideas related to climate:
good monitoring site due to low level of disturbance (except fire) - good for multi site design because of that. His main interest is paddlefish.

Concluding thoughts
C Jim A: We are very interested in fish collaboration; do faculty have avail. grad students? - No.
Tracy - NMFS needs to do more w/interior freshwater ecology & have dedicated funding. NOAA climate change focus since is ESA priority. TRFS is ideal site.

John F: ^{I think} NOAA is asking for a definitive integrated proposal of global climate change & freshwater ecology.

Dennis: bull trout most temp sensitive - they outcompete others only in very cold water (climate change importance).

John F: we are going to do Steve's plan (pit tag monitoring?)

primary productivity

Chris Peery: energy use of migrating salmon ^{his} focus.

Q: How do warmer water temps affect energy use?

He does spawning survey & why do some die before spawning on S FK. Temp is part of problem.

Watershed issue - others in CNR looking at land use affects on streams (Paul Link, Katy Kavanagh).

Jim Congleton: How extended migrations affect physiology of fish - his career focus (and affect of long migration on fish not from those stocks). Physiology & affect on survival.

Q: ^{What is the question you want to ask?} Is climate topic for long term or med term. Is there money available now? John - No. Phil: but a short proposal (Sp.) now could focus direction & \$ for global change freshwater initiative.

Christine Moffit: Her area: Role of parasites & pathogens on survival. Q: What are "natural" parasite/pathogen loads on Middle Fork fish? Red Flag for putting carcasses in spawning sites - because of danger of introducing pathogens.

Stephanie: Brian Kennedy will be interested in Steve's data and will want to do pit tag work at TR

Christine - Flattered NWFSC wants to involve us & we have intellectual expertise, ^{& grad students} but you too - Why do you need us? TRFS as site?

Dennis: We have expertise, but... haven't been to TR... ^{we must be} entrepreneurs - funding is difficult.

* "If you have \$ we can work together, if you don't we can't."

Phil: Always easier for us to get money if we are partnered with others.

John: 5 page proposal to submit. We could help find funding for WI to do research @ TRFS. No specific funding source at this time, but several potential options.

NWFSC interested in expanding collaboration beyond U Washington and potential NWFSC employees → WI grad program.

Action plan; assignments; goal & obj. statements NOAA will take lead for writing climate goals.

Rich Z: Climate affects at "Ecosystem" level more appealing to NOAA.