Northwest **Power** and **Conservation** Council

June 7, 2016

MEMORANDUM

TO: **Fish and Wildlife Committee**

FROM: **Lynn Palensky**

SUBJECT: **Briefing: May 2016 Regional Coordination Forum (and follow-up)**

BACKGROUND:

Presenters: Lynn Palensky, Regional Coordinators and Representatives of the Corps of Engineers and the Bureau of Reclamation

Summary: This briefing has three parts:

A. Summary of the third Regional Coordination Forum (RCF)
B. Summary of the follow-up call on fish health early warning system
C. Reports from fish and wildlife managers and river operators on summer conditions and preparations to prevent/reduce summer fish mortalities. *(Several representatives will be at the meeting or on the phone to provide a short report)*

Relevance: The RCF allows the Council to engage with the fish and wildlife managers in a way that allows focus and dialogue on the Council's and division's priority fish and wildlife work. It also provides a forum in which the managers can convey other issues of regional importance.

Work plan: This work is being tracked in the fish and wildlife work plan and the regional forum to discuss work priorities and will help inform the division's annual work plan, as well as in the Council's annual work plan, Section 2b. The discussion on an early warning system relates to our Program sections on Climate change and adaptive management.

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Executive Director

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Background:

A. Regional Coordination Forum: The meeting was held on May 12, 2016. Member Anders chaired the meeting and nearly 40 people attended.

Attachments:
1) Agenda for May 12 RCF meeting
2) Notes from the RCF meeting

The next RCF meeting is scheduled for May 12, 2016 in Boise, ID.

B: Summary of the follow-up call on fish health early warning system:
The May 12, RCF meeting began with a presentation from the Coordinators of the *Klamath Fish Health Assessment Team (KFHAT) regarding their work in the Klamath Basin of Oregon and California. KFHAT is an interdisciplinary team of scientists who monitor river conditions and other factors to evaluate fish health and the potential for fish kill. They use a color coded system (green, yellow, orange, red) to assess risk. As risk increases, they step up their level of engagement to include frequent phone calls, more exchange of information, recommendations for resource management actions, and finally, implementation of a Response Plan. The Response Plan's main focus is adding cold water to the system and curtailing agricultural withdrawals. The RCF was interest in exploring a similar effort for the Columbia Basin. A follow-up phone call with regional coordinators and other interested parties was planned for May 26th to discuss coordination opportunities.*

Attachments
3) Fish Health Early Warning System conference call agenda
4) Klamath Fish Health Assessment Team info (also see: http://www.kbmp.net/collaboration/kfhat)

C: Report on real-time temperatures and status of preparedness for triggering emergency actions or operational changes to prevent or minimize fish mortalities due to water temperatures. Updates are planned for June, July, August and September Council meetings.

More Info: The 2014 Fish and Wildlife Program:
- Regional Coordination - page 121:
- Appendix G. Climate Change impacts – Part Seven

Attachment 1

Regional Coordination Forum Agenda

May 12, 2016, 8:30 a.m. (Mountain Time) to 3:30 p.m. Payette Room

Hampton Inn & Suites Boise/Downtown

495 S Capitol Blvd, Boise, ID 83702

8:30	Welcome and introductions Purpose & objectives, review draft agenda, news	*F&W Committee Chair Anders*
8:45	Presentation on the Klamath Fish Health Assessment Team *KFHAT is a technical workgroup which formed during the summer of 2003 with the purpose of providing early warning and a coordinated response effort to avoid, or at least address, a non-hazardous materials related fish kill event in the anadromous portion of the Klamath River basin.*	*Sara Borok, CA Dept Fish and Wildlife & Katharine Carter, North Coast WQ Control Board*
9:45	Break	
10:00 Noon	Topics to discuss below	*All*
1. Flood Plain Habitat Strategies 2. Investigate blocked area 3. Council's Research Plan review and update 4. Program Cost Savings 5. Biological Objectives 6. NOAA Regional Assessment Partnership 7. Sturgeon – update from previous days' sturgeon meeting on status, strategies, and events 8. Lamprey – completing synthesis report 9. Non-natives 10. Long term O&M Plan Investment strategy 11. Long term monitoring and evaluation (at Chair's request)		
12:00	Lunch	
1:15	Continuation of discussion topics	*Fish and wildlife agencies and tribes and others*
2:00	Break	
2:15-3:30	Continuation of discussion and other topics brought forth by attendees. Wrap up.	*All* *Jennifer Anders*

Attachment 2

Northwest Power and Conservation Council
Regional Coordination Forum –MEETING NOTES
May 12, 2016 in Boise, Idaho

Attendees

Jennifer Anders Council-MT	Scott Donahue BPA
Tony Grover Council	Marcy Foster BPA
Lynn Palensky Council	Bruce Suzumoto NOAAF
Mark Fritsch Council	Jen Bayer PNAMP
Patty O'Toole Council	Chris Wheaton StreamNet
Nancy Leonard Council	Greer Mayer UCSRB
Laura Robinson Council	Joy Juelson UCSRB
Kerry Berg Council-MT	Steve Martin LCSRB
Kendall Farley Council-WA	Katharine Carter (CA Water Boards)
Karl Weist Council-OR	
Dan Rawding WDFW	PHONE:
Michael Garrity WDFW	Aja DeCoteau CRITFC
Paul Kline IDFG	Jay Hesse NPT
Matt Boyer MDFWP	Sue Ireland Kootenai Tribe
Tucker Jones ODFW	Joe Maroney Kalispel Tribe
Tom Rien ODFW	Lawrence Schwabe Grand Ronde Tribe
Tom Iverson YNF, CRITFC	Keith Kutchins UCUT
Dave Statler NPT	Sara Borok CDFG
Jason Kesling BPT	
Brent Nichols Spokane Tribe	
Bob Austin USRT	

* Next Regional Coordination Forum meeting: Thursday, December 15, 2016 in Portland.

Introduction:
Welcome by Jennifer Anders (Chair), and Lynn Palensky, Council staff.

1: Klamath Fish Health Assessment Team (KFHAT)
Sara Borok (CDFG) and Katharine Carter (CA Water Boards)

Sara and Katharine presented from the Klamath Fish Health Assessment Team (KFHAT) regarding their work in the Klamath Basin to provide early warning and a coordinated response effort to avoid, or at least address, fish kill events (non-hazardous materials) in the anadromous portion of the Klamath River basin. KFHAT is an interdisciplinary team of scientists who monitor river conditions and other factors to evaluate fish health and the potential for fish kill. They use a color coded system (green, yellow, orange, red) to assess risk. As risk increases, they step up their level of engagement to include frequent phone calls, more exchange of information, recommendations for resource management actions, and finally, implementation of a Response Plan. The Response Plan's main focus is adding water to the system and

curtailing agricultural withdrawals. See http://www.kbmp.net/collaboration/kfhat for more information.

KFHAT is a technical workgroup formed during the summer of 2003 with the purpose of providing early warning and a coordinated response to avoid, or at least minimize, a non-hazardous materials related fish kill event in the anadromous portion of the Klamath River Basin. No dedicated funding, all volunteer by participating entities.

2000 Drought, in fighting over water, large collaborative monitoring effort
2001 Upper Basin water shut off to agriculture
2002 Low flows, high fish runs, huge fish kill
2003 KFHA Team formed (>20 entities), technical workgroup, Assess water conditions and provide "early warning", Data and information sharing (hydrologic, fishery, disease, water quality, blue-green algae)

Fish Kill Response Plan – communication and notification protocol, identifies lead entity within zones of river, posters for public outreach, readiness levels (green, yellow, orange, red)

Klamath River Basin Fish Kill Response Training Manual – Water quality sampling, adult enumeration, juvenile enumeration, disease assessment

Response to early warning is primarily release of water from dams based on KFHAT science.

www.kbmp.net/collaboration/kfhat

We agreed there is a need for early indicators and a defined process for responding to early warning signals for fish kills in the CRB. There was interest in exploring a similar coordinated effort for the Columbia Basin. Council staff agreed to convene a two-hour conference call to explore how this might work, and to gage commitments from fish and wildlife managers.

2: NOAA Columbia River Partnership (outcome from Regional Assessment)
Bruce Suzumoto

NOAA has ESA, Trust, and sustainable fisheries responsibilities. NOAA is convening sovereigns and stakeholders to help balance those obligations in an open collaborative process. NOAA held a workshop on May 4 to discuss species status, tributary habitat, ocean, plume, and predation impacts. The next workshop is on June 7 in Portland to discuss harvest, hydro and hatcheries. The framework of the Marine Fisheries Advisory Committee (MFAC) to the Pacific Fisheries Management Council will be used to develop recommendations to NOAA based on the outcomes from these workshops. NOAA will be requesting nominations again from the sovereigns to participate on this newly created group based on Federal Advisory Committee Act (FACA) requirements. Bruce indicated that they are looking at a two year timeline for recommendations and decisions from this effort.

Discussion about the May 11 meeting to identify common biological objectives for salmon and steelhead. The Minimum Abundance Threshold is the only consistently expressed objective (natural origin spawners) but represents only the floor for each population. The recovery and sustainable harvest objectives are not expressed consistently (escapement to mouth, spawning escapement, includes hatchery fish or not, etc.). Bruce explained his vision for characterizing current habitat capacity, potential habitat capacity, potential hatchery contribution, and establishing goals for each of the species – then getting sovereign and stakeholder buy-in to these goals.

Comments: It's not easy to talk about "broad sense" goals.
Need objectives from lamprey

3: Floodplain Habitat Strategies

Aja DeCoteau provided a brief description that CRITFC will be hosting a floodplain restoration workshop and conference: Healthy Floodplains Living Rivers. The dates are Oct 18-20 and more information is on-line. Steve Martin promoted some new and interesting information that the SNSRB is working on in the Tucannon. He will be presenting that at the conference.

Bob Austin provided a brief discussion on efforts under the Columbia River Treaty to revisit flood plain risk studies to address the ecological function strategy.

4: Habitat Assessment for Reintroduction above Grand Coulee

Laura Robinson reported that the Council approved a Spokane Tribe project to perform a salmon habitat assessment above GCD for up to $200k for 18 months. The project has three objectives: 1) identify the potential geographic range for salmon and steelhead above Chief Joe and Grand Coulee, 2) identify key streams and reaches that could support salmon and steelhead, and 3) compile existing data that can be used for modeling habitat potential and identify data gaps. The results are due by December 31, 2017.

Council staff is also performing a literature review (white paper) of fish passage projects that are consistent with establishing passage at Chief Joe and Grand Coulee. The list currently includes at least 20 dams. The project will also focus on emerging technologies for passage at high head dams. The paper should be complete by the end of 2016.

Agenda Item 5: Sturgeon Update
Tom Rien & Lynn Palensky

The Council approved the CRITFC sturgeon master plan Step 1.
The sturgeon managers also met yesterday to coordinate on current issues.

- They would like to see some of the cost savings in the Program be applied to emerging priorities for sturgeon.
- The North American Sturgeon and Paddlefish Society will meet in Hood River in September.
- The sturgeon managers have been meeting in workshops to focus on specific topics to support the master plan and the sturgeon synthesis report. Now that those are complete, they will not be meeting again this year, and will use the NASPS conference to connect on Columbia River issues.
- Sturgeon in the lower Snake River are in peril. Need more frequent and more precise monitoring (sequential mark and recapture)
- Need to think about better monitoring of environmental conditions (temp and DO) in the mainstem (thinking about 2015 mortalities)
- The Spokane Tribe will be also submitting a Step 1 master plan for sturgeon by the end of the year.

Agenda Item 6:
Cost Savings Work Group
Jennifer Anders

The 2014 F&W Program included an investment strategy and identified priorities for future work. The Program also provided language that cost savings would be explored to fund the new priorities before Council would ask BPA for additional funds. The work group created a methodology and has identified $651k in savings from five projects, mostly from planned close outs of existing projects. Based on discussion with the fish and wildlife committee, the workgroup will explore a process to examine a programmatic group of Relative Reproductive Success projects for potential savings. The Council is asking BPA to redirect savings to fund emerging priorities. $200k has been obligated to the habitat assessment above Grand Coulee. The group had a good discussion of the work and next steps. Folks are generally supportive of the effort with some comments and questions including:

Comments:
- Keep the process transparent
- Keep the focus on cost savings rather than cost *cutting*
- Review of RRS projects should include a science review as well
- How will regular project reviews work with any programmatic reviews of the workgroup?
- Don’t buy into the BPA notion that the budget is fixed, and not follow the language of the Program to ask for additional funds after scrutinizing project budgets.
- The wildlife projects are the next up for a categorical review.

- BPA is opening up a rate case and that may be the place to request additional funding for the Program.
- Funds redirected may be to new or existing (expanded work)
- How do folks submit ideas for new work?

7: Research Plan
Patty O'Toole

Tom Karier is leading a work group to update the Council's Research Plan. Staff has developed a work plan with explicit tasks including 1) ISAB/ISRP Report (completed), 2) Public Comment (completed), 3) Historical look at past investment for research (under way), 4) Identify list of Critical Uncertainties (completed), 5) Develop a framework for prioritization (July/August), 6) Consider and describe any needed process elements (August), 7) Committee approval (Sept/Oct), 8) Public Comment (Oct/Nov), 9) Revise per comments (Nov), 10) Final review and approval (Dec/Jan).

Comments:
- Research needs to answer a question or management action or be informed by something specific.
- Distinguish between Research and M&E
- Don't throw out big basin wide M&E because it might work well in one place and not another.

8: Non-native and invasives

The next meeting of the 100th Meridian Initiative's Columbia River Basin Team is scheduled for May 24-25, 2016 in Spokane, WA. If you are interested in attending the meeting please contact Susan Anderson @ sanderson@psmfc.org.

The Snake River Salmon Recovery Board (SNSRB) is writing a letter to the region requesting urgency in addressing non-natives and invasive in the lower Snake River. The contact for this is Steve Martin, Executive Director. Questions - (509) 382-4115 or debseney@snakeriverboard.org

9: O&M update
Development of strategy IEAB and transmission template
FSOC – Phase 1 inventory
Screens – ownership obligations
Need update on Mitchell act funding

Comments:
Regional Coordinators should see copies of broader-reaching letters that go out to people (e.g. Ltr sent to hatcheries)

Next Steps:

1) A follow up conference call will be held on May 26th to discuss if/how to collaborate on development of an early warning for drought conditions in the Columbia River.

   At the Regional Coordination Forum meeting on May 12, there was a presentation from the Klamath Fish Health Assessment Team (KFHAT) regarding their work to provide early warning and a coordinated response effort to avoid, minimize or deal with, a fish kill event (non-hazardous materials) in the Klamath basin. At the RCF, there was interest in exploring a similar effort for the Columbia Basin. NWPCC staff agreed to convene a two-hour conference call to explore how this might work, and to gage commitments.

   A bit of background from the May 12th meeting:
   https://nwCouncil.box.com/s/tjbdv5u0t57euvbr3ve5lmtwr5v7c58k

2) Next Regional Coordination meeting in Portland, Oregon on December 15, 2016

Attachment 3

Columbia River Fish Health: Early Warning
May 26th, 2016
Council Offices, Portland OR
Draft Agenda

1:30
Welcome (Lynn Palensky)
Introductions (Name and affiliation)
Background (Lynn Palensky)
Review Meeting Objectives

A: Explore opportunities to improve coordination of data and data sharing regarding fish passage and adverse environmental conditions in an effort to respond quickly and efficiently to prevent/minimize fish mortality.

B: Explore opportunities to improve communication and coordination of resources to assess the cause and scope of fish mortality in the event of a fish kill.

2:00
What do conditions look like for this summer? (All)
How are we approaching this summer based on last year?

1. FPAC (memo)
2. Paul Kline IDFG SR Sockeye
3. Okanogan (Jeff Korth) Sockeye
4. Fish Passage Center (what they provide)
5. Others MFWP (Matt Boyer), CRITFC, Tribes, Teresa Scott (WDFW), USGS, EPA, others?

3:00
Other considerations: (ALL)

- How can we better support the existing processes?
- What more environmental data do we need?
- Fish mortality response between BONN and McNary. How do we deal with that this summer, or in the future?
- How can we share resources/equipment?

3:20
Wrap-up and next steps (Jennifer Anders and Lynn Palensky)

Klamath Basin Monitoring Program

Real-Time Data

Link to Real-Time WQ Map

Site	Flow (cfs)	Time	WQ Data
Link River at Klamath Falls	1110	16:15PDT	Yes
Klamath River at Keno (Top)	890	15:45PDT	Yes
Klamath River at Keno (Bot)	890	15:45PDT	Yes
Klamath River below Iron Gate	1140	16:15PDT	Yes
Klamath River at Orleans	5240	16:30PDT	Yes
Klamath River near Klamath	9600	15:30PDT	Yes
Shasta River near Yreka	78	16:00PDT	Yes
Scott River near Fort Jones	611	16:30PDT	Yes
Salmon River at Somes Bar	1210	16:30PDT	Yes

Klamath Fish Health Assessment Team (KFHAT)

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To accomplish this goal, KFHAT created a network through which information about current river and fish health conditions in the Klamath Basin can be quickly shared among participants, the general public, and resource managers.

Current Readiness Levels:

Mainstem Klamath River and Tributaries - **Green**

- All conditions appear okay, fish are healthy and no immediate problems are foreseen
- Data sharing is not as crucial here, but continue to observe and document conditions

Read more about the **Readiness Levels**

For Additional Information Contact:

Sara Borok - California Department of Fish and Wildlife (KFHAT Co-coordinator)
Email: Sara.Borok@wildlife.ca.gov
Phone: 707-822-0330
Katharine Carter - North Coast Regional Water Quality Control Board (KFHAT Co-coordinator)
Email: Katharine.Carter@waterboards.ca.gov
Phone: 707-576-2290

Report sick or dead fish - Call (800) 852-7550 Flyer for Klamath and Trinity Rivers

Klamath Fish Health Assessment Team Readiness Level Interactive Map

The KFHAT interactive map (click on map for link) presents the readiness level for the Klamath Basin below Iron Gate dam in a visual format. The user can click on any segment of the Klamath River or its tributaries to access a pop-up window with links to websites containing water quality, fisheries, and disease data and information.

Fish Health Updates:

- 2016
- 2015
- 2014
- 2013

Trinity River at Lewiston	3010	16:30PDT	Yes
Trinity River at Hoopa	4300	16:00PDT	Yes

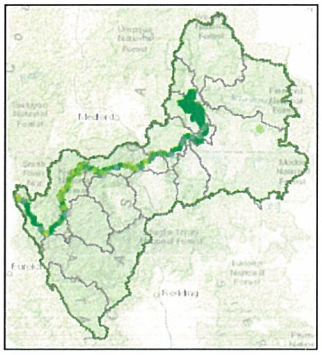
The table above contains provisional data provided by the USGS via the waterservices site. All data are provisional and may be recalculated before final approval. This table may take several seconds to load.

* = value 2+ hours old
**=4 or more hours

KBMP Vision

The Klamath Basin Monitoring Program facilitates the coordination and implementation of water quality monitoring in support of the stewardship, protection, and restoration of all beneficial uses within the Klamath River watershed, with the ultimate goal of restoring water quality. Learn More

Blue-Green Algae Map



Search ... Search ... 0

No sections of the Klamath River are currently posted.

Fish Health

Readiness Level

Mainstem Klamath and Tributaries- Green
Learn more about fish health and KFHAT

Triggers for KFHAT Initial Investigations and Full Monitoring Response

Initial Investigations:

KFHAT will investigate any credible report of sick or dead fish along the Klamath River or its tributaries. PLEASE REPORT ANY OBSERVATIONS OF LARGE NUMBERS OF DEAD OR DYING FISH TO SARA BOROK (California Department of Fish and Wildlife): 707-822-0330.

Full Monitoring Response:

Trigger for Adult Fish Kill Monitoring Response by KFHAT: Greater than 50 fresh adults (clear eye) in a 24 hour period in any 20 km reach.

Trigger for Juvenile Fish Kill Monitoring Response by KFHAT: Based on the best professional judgment (BPJ) of KFHAT members. KFHAT members include fishery biologists at various agencies, tribes, and watershed organizations. These biologists have many years of experience working on the river and will use their BPJ to determine when juvenile fish are sick or dying in numbers that are greater than background values.

About KFHAT

The Klamath Fish Health Assessment Team (KFHAT) is a technical workgroup which formed during the summer of 2003 with the purpose of providing early warning and a coordinated response effort to avoid, or at least address, a non-hazardous materials related fish kill event in the anadromous portion of the Klamath River basin.

To accomplish this goal, KFHAT created a network through which information about current river and fish health conditions in the Klamath Basin can be quickly shared among participants, the general public, and resource managers.

What We Do:

- Monitor conditions and provide resource managers with real-time data and information about river conditions as an early warning of a fish kill
- Provide a coordinated monitoring response to an imminent or active fish kill
- Collect data and information to better understand conditions and the warning signs leading to a fish kill

What We Don't Do:

- We don't set policy.
- We don't determine resource management.

KFHAT is a technical workgroup which provides data and information to policy makers and resource managers.

Participants

Documents

Publications

Contacts

Trinity River at Lewiston	2720	11:30PDT	Yes
Trinity River at Hoopa	4290	11:00PDT	Yes

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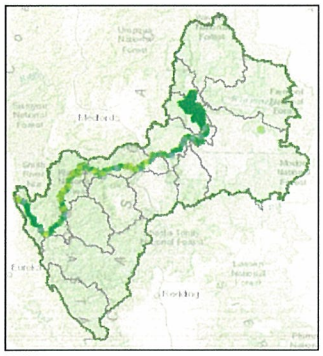

BGA Tracker-

No sections of the Klamath River are currently posted.

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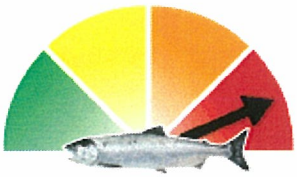
Participants
Documents
Publications
Contacts

Klamath Fish Health Assessment Team (KFHAT)

Four Levels of Readiness:

	**1. Green** - River conditions appear satisfactory, fish appear healthy, no immediate problems foreseen. - Frequent data sharing is not as crucial at this level, but continue to observe and document conditions.
	**2. Yellow** - Conditions, such as unfavorable physical or chemical conditions, observation of increased incidence of pathogens, or increased fish morbidity and/or mortality suggest the need for heightened awareness. - Frequent data sharing among KFHAT and resource managers becomes important. - The Response Plan procedures should be reviewed and responders should be ready to take action if the situation worsens.
	**3. Orange** - A kill is likely to occur and management levels in agencies need to be alerted. - Frequent data sharing among KFHAT and resource managers is vital. - If possible, KFHAT will provide recommendations for resource management actions to management with basis for recommendations.
	**4. Red** - A fish kill is occurring or imminently expected. - Frequent data sharing is crucial and relies on quick and accurate information exchange by phone with follow-up documentation. - The Response Plan is fully implemented. - Immediate management actions may be needed to avoid further mortality.

There are multiple agencies/organizations throughout the Klamath/Trinity Basin measuring or monitoring various water quality parameters, juvenile fish emigration, fish health, and more. In some cases, these monitoring efforts may serve as useful warning indicators of deteriorating conditions an increased risk of a pending fish die-off.

Klamath Basin Monitoring Maps

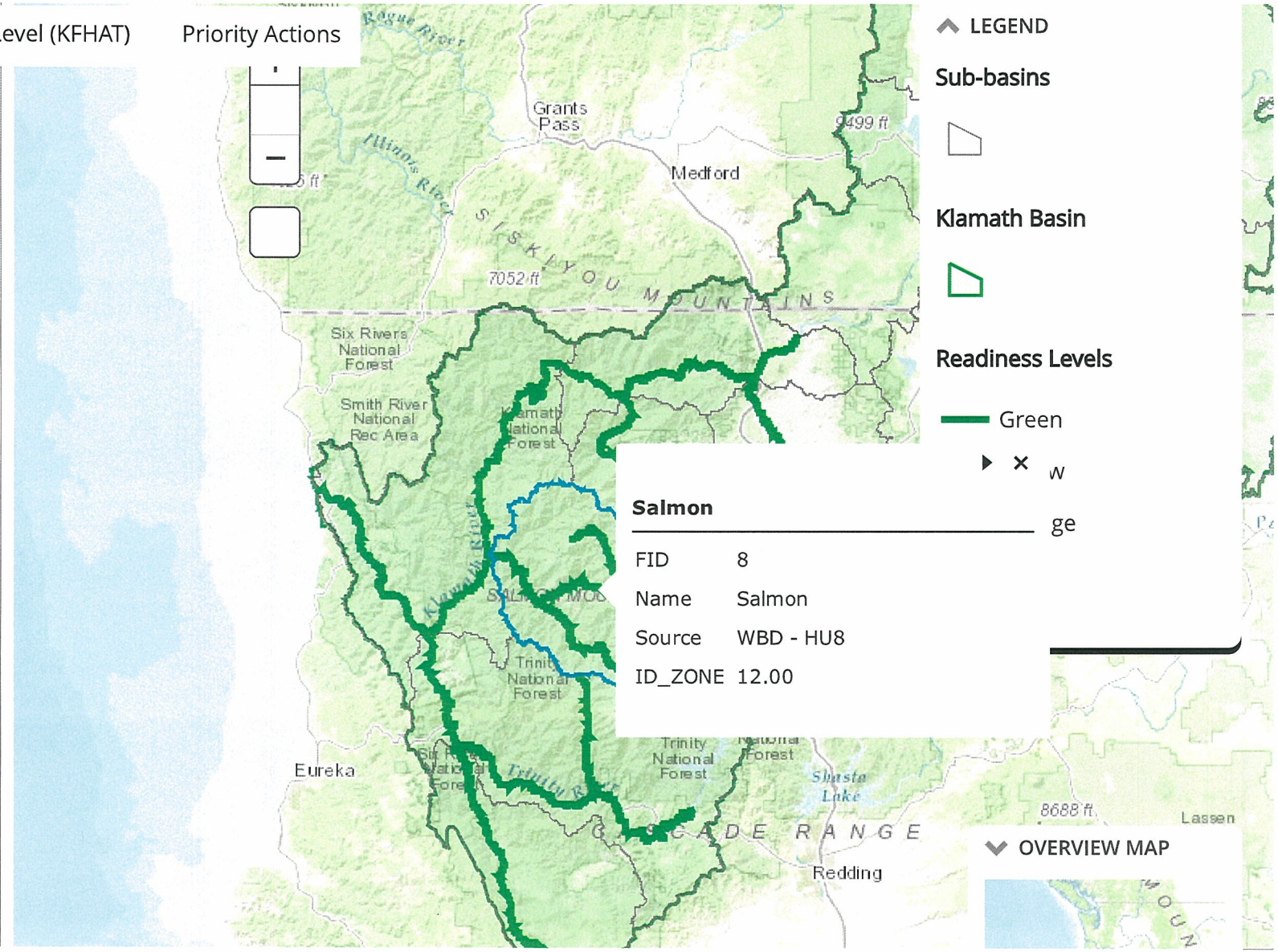
A story map

Maps are developed by the Klamath Basin Monitoring Program (KBMP) in partnership with a variety of organizations who collect water quality an ata.

2014 Monitoring Locations | 2014 Real-Time Monitoring Locations | Klamath River Blue-Green Algae Tracker

Fish Health Readiness Level (KFHAT) | Priority Actions

The Klamath Fish Health Assessment Team (KFHAT) interactive map presents the 'Readiness Level' for the Klamath Basin below Iron Gate dam in a visual format. The user can click on any segment of the Klamath River or its tributaries to access a pop-up window with links to websites containing water quality, fisheries, and disease data and information. KFHAT is a technical



UPDATE ON MANAGEMENT ACTIONS TO REDUCE COLUMBIA BASIN FISH MORTALITIES IN 2016

OREGON Fish & Wildlife

Montana Fish, Wildlife & Parks

IDAHO FISH & GAME

Washington Department of FISH and WILDLIFE

COLUMBIA BASIN FISHERY AGENCIES AND TRIBES

Outline

- Background
- 2015 Review
- 2016 Forecasts
- 2016 Proposed Actions
- Managers Updates
- Summary

Background

- **Challenge:** high water temperatures in the Columbia River basin are correlated with higher resident and anadromous fish mortalities as was observed in 2015
- **Regulations:** the Environmental Protection Agency (EPA) is responsible for developing and implementing water quality standards (i.e. water temperature).
- **Actions:** Since fish managers have ***no*** authority to regulate water temperatures, we work with others to reduce water temperatures (i.e. Dworshak release) and take emergency actions to reduce risks to fish populations (i.e. transport adult Snake River sockeye, modify fishing regulations, etc.)

2015 Review

- At the August 2015 Missoula Council meeting co-managers, NOAA, & COE provided an update on increased sockeye, Chinook, and white sturgeon mortality in July.
- At the April 2016 Missoula Council meeting NOAA, IDFG, and COE provided a summary of 2015 environmental conditions, observed and estimated mortality, and recommendations to improve fish passage and survival.
- NPCC facilitated 2016 coordination in April at Boise meeting and a May conference call.

2015 Review

- Substantial coordination effort through Regional Technical Teams (FPAC, FPOM, and TMT) along with states to reduce temperature related fish mortality in 2015.
- **Snake River Sockeye:** 75% mortality in BON-MCN reach. High mortality also occurred from MCN-LWG (67%) and LWG-Sawtooth Valley(70%) due to extreme temps.
  - Timely permitting by NOAA for emergency trap & haul for these ESA listed fish.
  - Efficient coordination between NOAA, COE, IDFG, and NPT for successful trap and haul.
  - COE released cold water from Dworshak and pumped cool water into LWG ladder to improve passage conditions.
- **Upper Columbia Sockeye:** 40% mortality BON-MCN, 22% mortality MCN -WEL, and 88% mortality WEL-Zosel.
  - Wenatchee & Okanogan sockeye same mortality in mainstem Columbia but much less mortality in Wenatchee compared to Okanogan due to lower water temps.

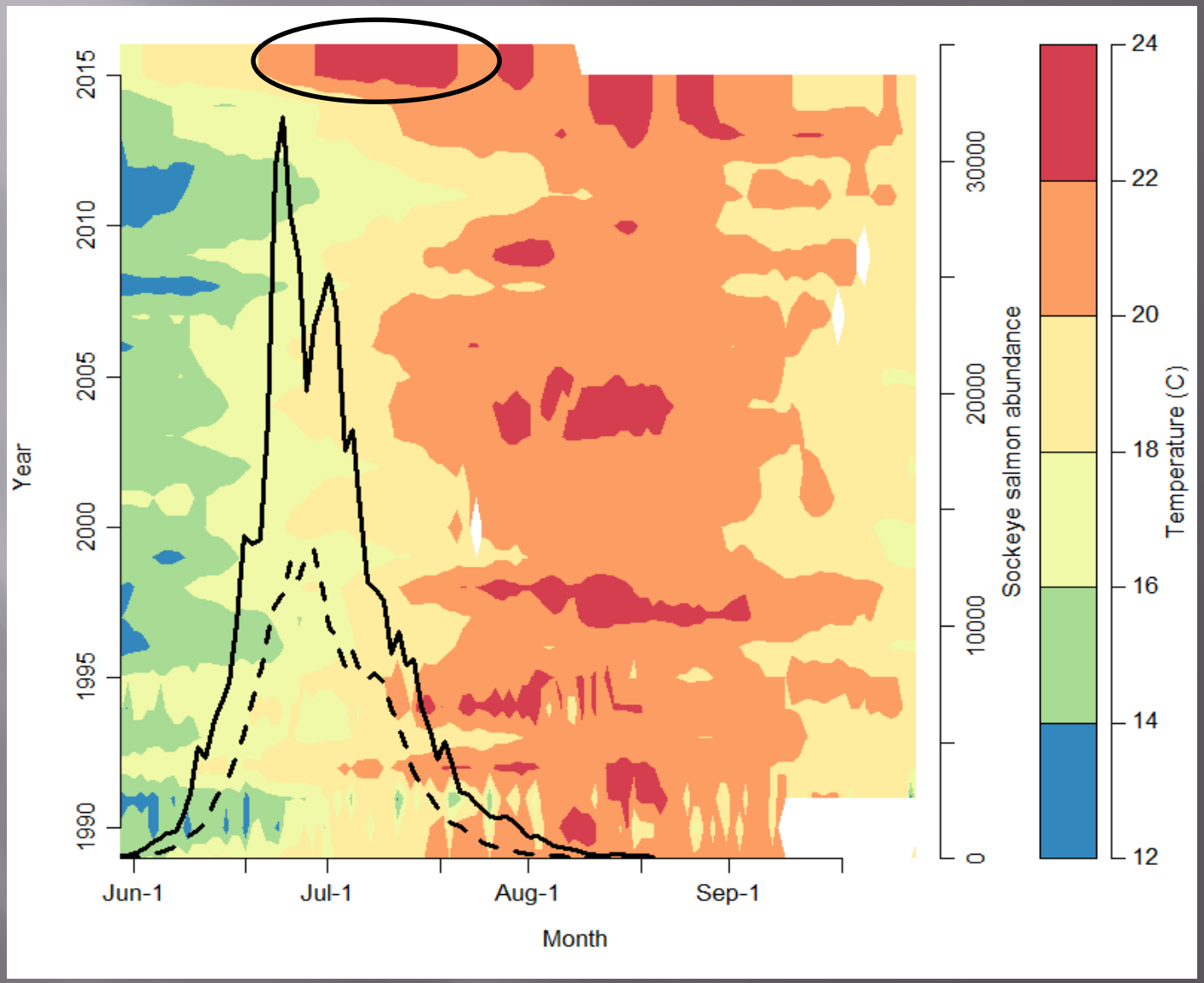
2015 Fish Health

- USFWS Lower Columbia Fish Health Center (LCFHC) in Willard, WA observed physical signs of stress (petechial hemorrhaging throughout body surface; see below) for sockeye when water temp reached 69 degrees in mid-June at BON.
- *Flavobacterium columnare* (Columnaris) and *Aeromonas hydrophilia* bacterium were isolated from sampled sockeye.
- Need freshly dead fish (< 2 hours) for best disease screening because fish condition deteriorates very fast in warm water (>68 degrees).

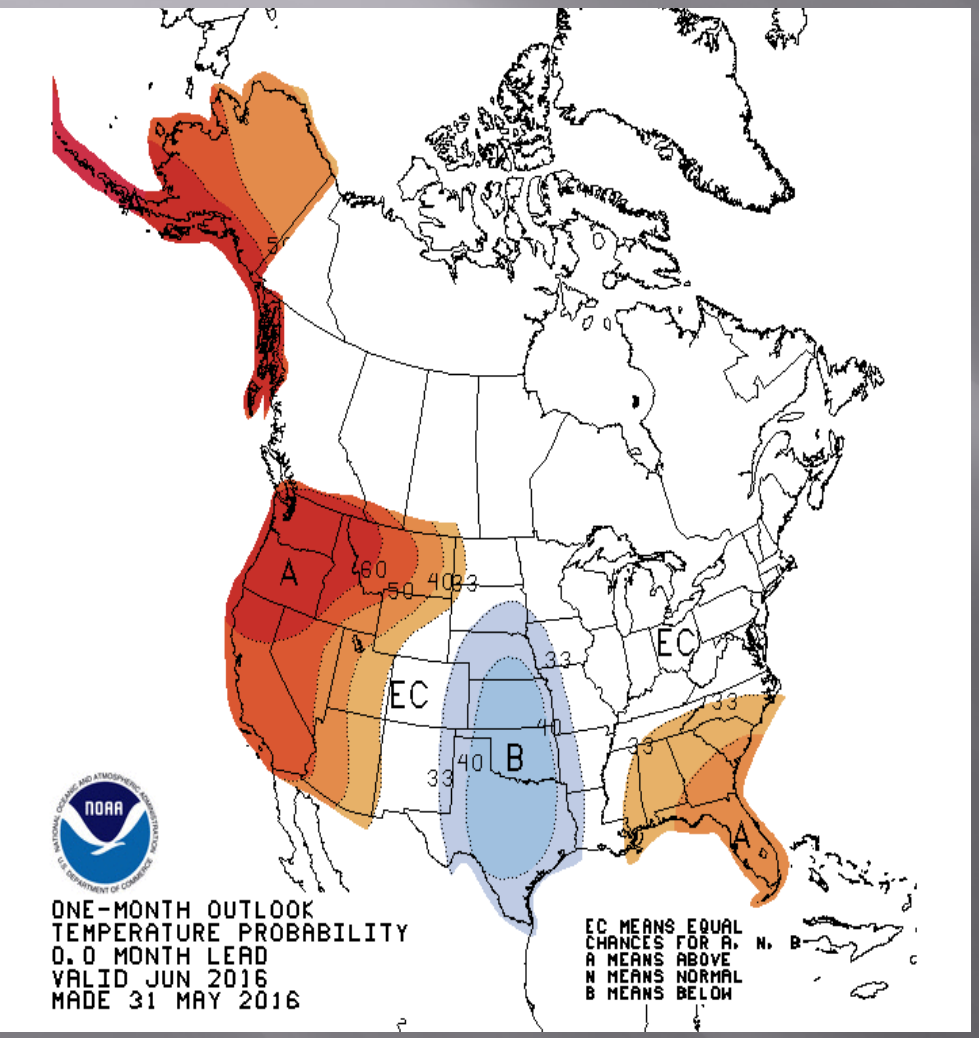
2016 Update

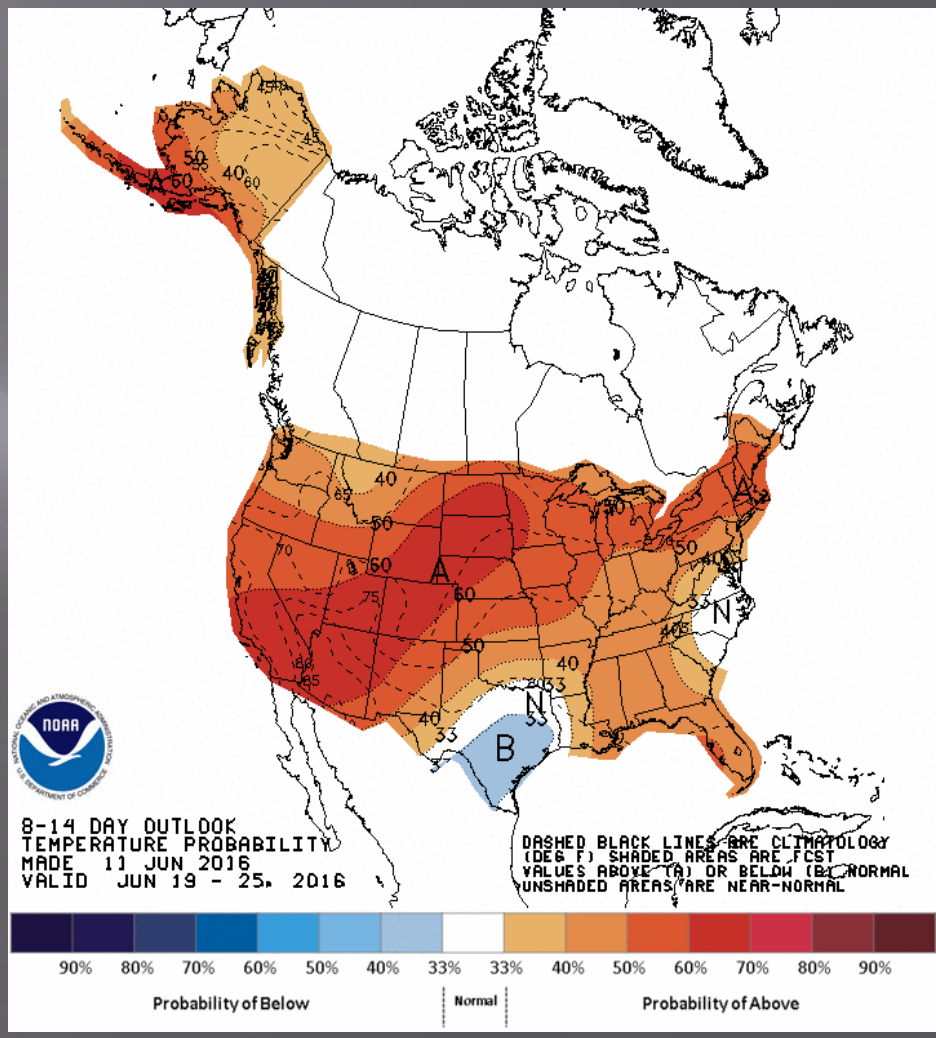
- Total sockeye BON return was ~500,000 in 2015 with a forecast of ~110,000 for 2016.
- Snake River sockeye BON return was ~4,000 in 2015 with a forecast of ~ 1,300 for 2016.
- High correlation between air and water temperature in the summer
- If we have extended hot air temperatures east of the Cascades we will have warm water temperatures in the Columbia & Snake.

BON Sockeye Migration & Water Temps

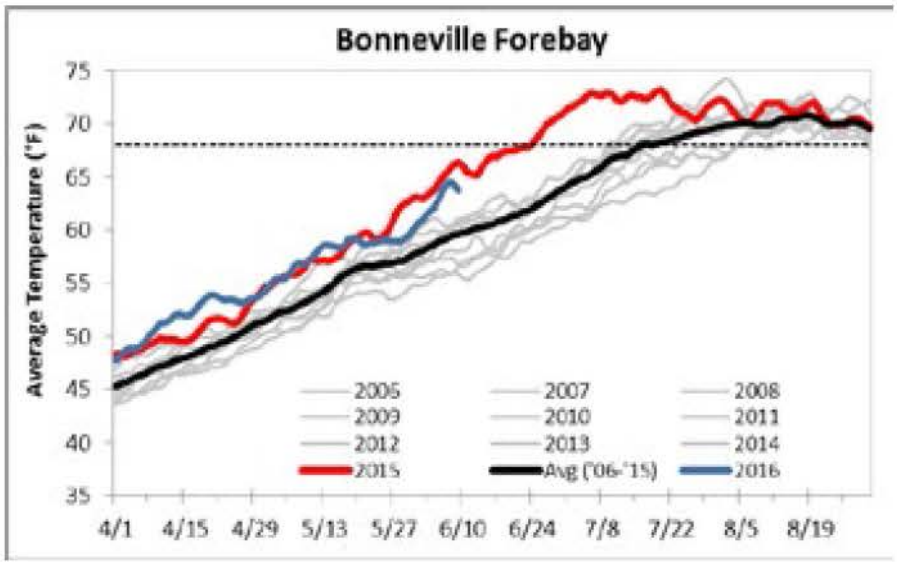


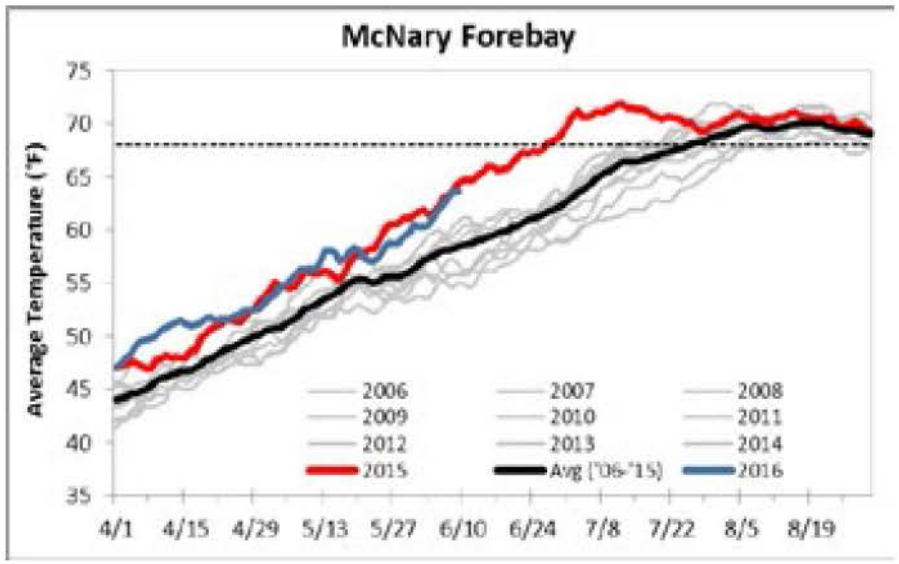
2016 June Air Temperature Forecasts

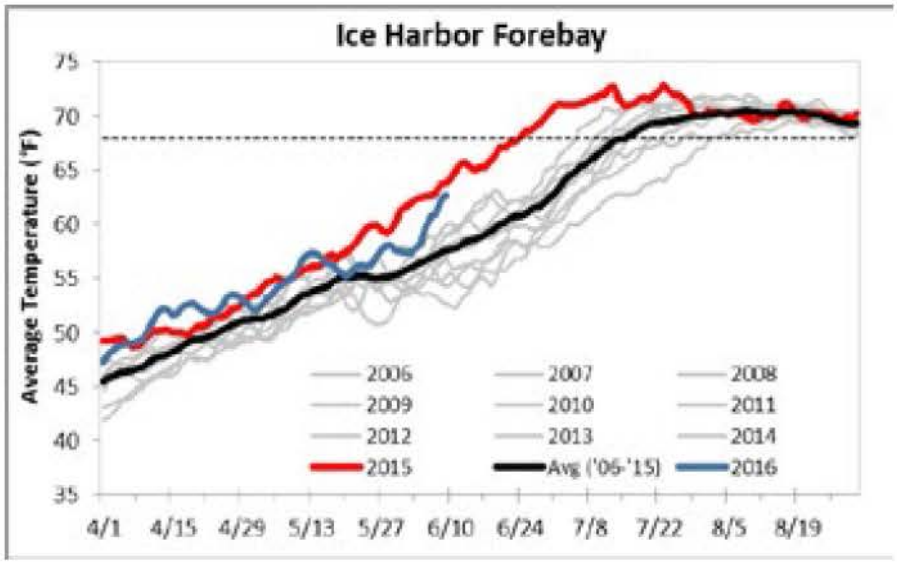


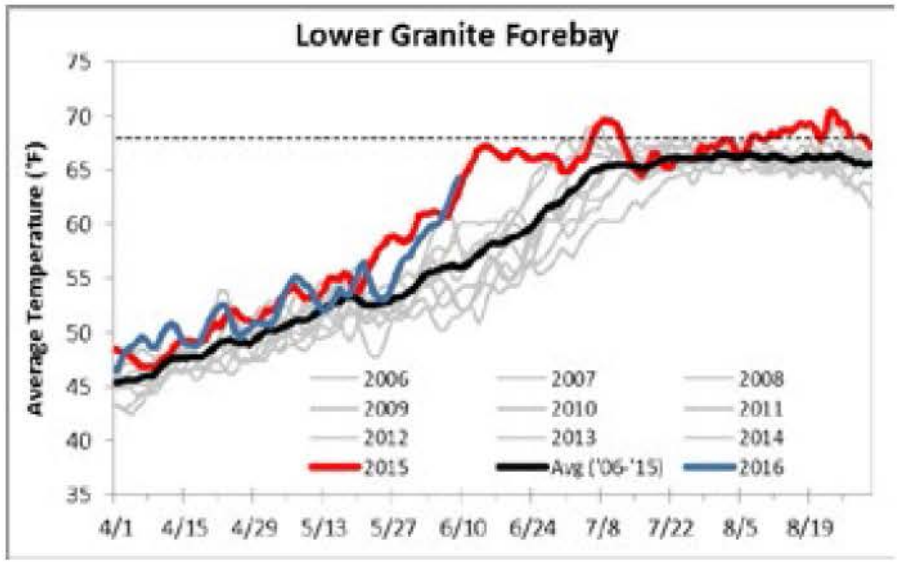


2016 Water Temperatures (FPC)









Actions Reviewed for 2016

- The most sockeye losses occurred between BON and MCN in 2015 due to high water temps.
  - Typical response is to release cool water from reservoirs (e.g. Dworshak release) but we have no large reservoirs storing cool waters for a release.
- The highest mortality for Okanogan Sockeye occurred in the Okanogan River below the lake.
  - Transboundary Okanogan sockeye workgroup has pursued the option of transporting fish from WEL to Okanogan Lake but little progress has been made due challenges in moving fish across the international border with Canada.

2016 Regional Technical Teams Actions

- In partnership with the COE additional water temperature data from fish ladders was added to Fish Passage Center (FPC) and Technical Management Team (TMT) websites.
- As temps approach 68 degrees in the LGR tailrace the COE will actively manage discharges from DWR to help keep temps < 68 degrees.
- COE will pump cold water from deep in LWG forebay into fish ladder at LWG and LGS.
- Adult migration will be monitored by both dam counts and PIT tag data. Adult health will be monitored at the LGR trap. If passage emergency is declared Snake River sockeye will be transported from LWG to Idaho.
- Streamline fish passage actions based on recommendations from a new subcommittee.

Monitoring Fish Mortalities

- Continue to have the public (fishers), technicians, biologists, and enforcement officers report fish mortalities to their respective agency.
- Anglers participating in the northern pikeminnow sport reward fishery will be surveyed to report fish mortalities.
- Given that fish often sink after dying and reservoirs are deep, we often observe fish (floaters) only after substantial decomposition, so many carcasses are not useful for fish health monitoring.
- Continue to work with LCFHC to examine fresh mortalities but likelihood of finding freshly dead fish is low. USFWS and NOAA are proposing to continue sampling at BON and LWG for fish health.

Environmental Monitoring

- In cooperation with the COE, the FPC has added additional temperature data and sites to their website to better track system wide water temps. Temp and flow information available at the COE TMT websites.
- USGS gauge at White Bird is the only online water temperature site in the Salmon River. IDFG will continue to monitor Salmon River water temperature for real time decisions but data is not available online.
- We still have gaps in real time reporting (e.g. Salmon River in Idaho), and between dams on Columbia especially between BON and MCN.

Acknowledgments

- NOAA and others. 2016. 2015 Adult Sockeye Salmon Report, draft.
- Fish Passage Center. 2016. Weekly Report # 16-13.
- Ken Lujan (USFWS). May 2016 Fish Health Summary Memo.

Manager Updates

- Idaho
- Oregon
- Montana
- CRITFC
- NOAA
- Washington

Summary

- Monitoring of salmon passage and survivals from mouth to LWG are coordinated by regional technical teams (FPAC, FPOM, TMT), which meets weekly or more frequently as needed. FPAC info at http://www.fpc.org/,TMT and FPOM info at http://www.nwd-wc.usace.army.mil/tmt/
- Outside of this area (mouth to LWG) local coordination for anadromous and resident fish occurs at the international, state, subbasin, and stream scales.
- We do not have single location to summarize all monitoring data and actions but they are occurring as co-managers described.
- Due to uncertainty in the weather forecast(i.e. air temperature), it is unclear if we will experience the same level of fish losses observed in 2015.
- Regardless, given the "available tools" we are better prepared to take actions to reduce fish mortality in 2016.