Department of Energy

Bonneville Power Administration
P.O. Box 3621
Portland, Oregon 97208-3621

FREEDOM OF INFORMATION ACT PROGRAM

February 3, 2022

In reply refer to: FOIA #BPA-2021-01012-F

Tony Schick
Oregon Public Broadcasting/ProPublica
7140 SW Macadam Ave
Portland, OR 97219
Phone: 503-329-7962
Email: aschick@opb.org

Dear Mr. Schick,

This communication concerns your agency records request submitted to the Bonneville Power Administration (BPA), made via the Freedom of Information Act, 5 U.S.C. § 552 (FOIA). Your request was received on August 16, 2021, and formally acknowledged on August 25, 2021.

Request
"I request copies of any correspondence between BPA staff and Michele DeHart of the Fish Passage Center that include the phrases "CRSO" and "EIS" or "preferred alternative". I'm only seeking these records from April 2019 to present."

Response
The agency's Cyber Security Forensics & Intelligence office searched for and collected 302 pages of responsive records. Those pages accompany this communication with the following redactions:

- 89 pages with redactions applied under 5 U.S.C. § 552(b)(6) (Exemption 5)
- 22 pages with redactions applied under 5 U.S.C. § 552(b)(5) (Exemption 6).

A more detailed explanation of the applied exemptions follows.

Explanation of Exemptions
The FOIA generally requires the release of all agency records upon request. However, the FOIA permits or requires withholding certain limited information that falls under one or more of nine statutory exemptions (5 U.S.C. §§ 552(b)(1-9)). Further, section (b) of the FOIA, which contains the FOIA's nine statutory exemptions, also directs agencies to publicly release any reasonably segregable, non-exempt information that is contained in those records.

Exemption 5

Exemption 5 protects "inter-agency or intra-agency memorandums or letters which would not be available by law to a party other than an agency in litigation with the agency" (5 U.S.C. § 552(b)(5)). In plain language, the exemption protects privileged records. The FOIA's Exemption 5 deliberative process privilege protects records showing the deliberative or decision-making processes of government agencies. Records protected under this privilege must be both pre-decisional and deliberative. A record is pre-decisional if it is generated before the adoption of an agency policy. A record is deliberative if it reflects the give-and-take of the consultative process, either by assessing the merits of a particular viewpoint, or by articulating the process used by the agency to formulate a decision.

In this case, BPA relies on Exemption 5 to protect communications regarding the draft environmental impact statement (EIS) on Columbia River System operations. These records reflect the agency's pre-decisional and deliberative processes in drafting the EIS. BPA has considered and declined a discretionary release of some pre-decisional and deliberative information in the responsive records set because disclosure of the records would harm the interests protected and encouraged by Exemption 5.

Exemption 6

Exemption 6 serves to protect Personally Identifiable Information (PII) contained in agency records when no overriding public interest in the information exists. BPA does not find an overriding public interest in a release of the information redacted under Exemption 6—specifically, signatures and mobile telephone numbers. This information sheds no light on the executive functions of the agency and BPA finds no overriding pubic interest in its release. BPA cannot waive these redactions, as the protections afforded by Exemption 6 belong to individuals and not to the agency

As required by 5 U.S.C. § 552(a)(8)(A), information has been withheld only in instances where (1) disclosure is prohibited by statute, or (2) BPA foresees that disclosure would harm an interest protected by the exemption cited for the record. When full disclosure of a record is not possible, the FOIA statute further requires that BPA take reasonable steps to segregate and release nonexempt information. The agency has determined that in certain instances partial disclosure is possible, and has accordingly segregated the records into exempt and non-exempt portions.

Fees

There are no fees associated with processing your FOIA request.

Certification

Pursuant to 10 C.F.R. § 1004.7(b)(2), I am the individual responsible for the records search, redaction decisions, and information release described above. Your FOIA request BPA-2021-01012-F is now closed with the responsive agency information provided.

Appeal
The adequacy of the search may be appealed within 90 calendar days from your receipt of this letter pursuant to 10 C.F.R. § 1004.8. Appeals should be addressed to:

Director, Office of Hearings and Appeals
HG-1, L'Enfant Plaza
U.S. Department of Energy
1000 Independence Avenue, S.W.
Washington, D.C. 20585-1615

The written appeal, including the envelope, must clearly indicate that a FOIA appeal is being made. You may also submit your appeal by e-mail to OHA.filings@hq.doe.gov, including the phrase "Freedom of Information Appeal" in the subject line. (The Office of Hearings and Appeals prefers to receive appeals by email.) The appeal must contain all the elements required by 10 C.F.R. § 1004.8, including a copy of the determination letter. Thereafter, judicial review will be available to you in the Federal District Court either (1) in the district where you reside, (2) where you have your principal place of business, (3) where DOE's records are situated, or (4) in the District of Columbia.

Additionally, you may contact the Office of Government Information Services (OGIS) at the National Archives and Records Administration to inquire about the FOIA mediation services they offer. The contact information for OGIS is as follows:

Office of Government Information Services
National Archives and Records Administration
8601 Adelphi Road-OGIS
College Park, Maryland 20740-6001
E-mail: ogis@nara.gov
Phone: 202-741-5770
Toll-free: 1-877-684-6448
Fax: 202-741-5769

Questions about this communication may be directed to the FOIA Public Liaison Jason Taylor at jetaylor@bpa.gov or 503-230-3537. Thank you for your interest in the Bonneville Power Administration.

Sincerely,

Candice D. Palen
Freedom of Information/Privacy Act Officer

Responsive agency information accompanies this communication

From: Daniel Widener - NOAA Affiliate

Sent: Thu Sep 05 13:31:05 2019

To: Doumbia,Julie A (BPA) - PEH-6

Cc: Michele Dehart; James Faulkner; Chuck Chamberlain (NWW); Sue Camp (scamp@usbr.gov); Rich Zabel

Subject: [EXTERNAL] Re: Follow-up CRSO MO3 modeling analysis question

Importance: Normal

Hello Julie,

[redacted] (b) (5)

(b) (5)

[redacted]

(b) (5) [redacted].

Dan Widener

On Thu, Sep 5, 2019 at 11:17 AM Doumbia,Julie A (BPA) - EC-5 <jadoumbia@bpa.gov> wrote:

Hello Michele and Dan,

(b) (5) [redacted]

If possible, we would appreciate responses today or tomorrow, but early next week is okay if you need more time to look into this question.

Thank you,

Julie

Julie Doumbia

Environmental Protection Specialist

Bonneville Power Administration
bpa.gov | P 503-230-7641 | C (b) (6) [redacted]

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Daniel Widener
Contractor with Ocean Associates, Inc.
Fish Ecology Division

From: Michele Dehart

Sent: Mon Mar 09 13:30:50 2020

To: Hauser,Tracy L (BPA) - EWL-4

Subject: [EXTERNAL] FW: CSS presentation

Importance: Normal

Attachments: CSS analyses of CRSO Alternatives for PFMC.pptx; CSS analyses of CRSO Alternatives for PFMC.pptx

FYI

From: Michele Dehart
Sent: Friday, March 6, 2020 12:15 PM
To: 'Randy Fisher' <RFisher@psmfc.org>; ED.Bowles@state.or.us; Michael Garrity (michael.garrity@dfw.wa.gov) <michael.garrity@dfw.wa.gov>; Tucker Jones <Tucker.A.Jones@state.or.us>; Elicker, Roy E <roy_elicker@fws.gov>; Castro, Janine M <Janine_M_Castro@fws.gov>; 'Adam J Storch' <Adam.J.Storch@state.or.us>; Art Martin <Art.C.Martin@state.or.us>; Rob Lothrop (lotr@critfc.org) <lotr@critfc.org>
Subject: FW: CSS presentation

Randy:

I have reviewed this presentation sent to you by Crystal Ball, BPA. This is a presentation of the January 24, 2020 submittal of CSS analyses of the Preferred Alternative. This presentation is a simplified version of the documents that we have provided to the federal action agencies in the CRSO-EIS process on April 29, 2019 and January 24, 2020 . The first part of the presentation is a brief explanation of the history of the development of CSS models. This has been presented at multiple CSS Annual Review meetings which are public. The assessment of risk of each alternative is a simplified representation of the upper and lower quartile ranges of results that are included in the analytical results that we have submitted to the action agencies. In our submittal to the action agencies we clearly emphasized the lower quartile range in which smolt to adult return rates were predicted to be less than 1%, which is below population replacement. We also emphasized in our submittal to the action agencies that NOAA predictions indicated that in future climate change scenarios , poor ocean conditions and poor flow conditions would occur more often than have historically. After submittal of the documents to the action agencies, several of our constituent agencies and tribes were unclear on the meaning of the upper and lower quartile ranges of results confusing those with statistical confidence intervals. To avoid this confusion, the same data is displayed in simpler terms of probability of being below 1% replacement. There is no new analyses or new numbers here. The numbers are the numbers. The CSS analyses of the PA is used in the Draft CRSO-EIS.

The PFMC staff contacted me in mid-February and asked if I could present the CSS Analyses to the Habitat Committee of the PFMC. I explained the non-disclosure agreement and explained that we would not discuss any analyses until after the draft EIS was released. I explained that I expected the draft EIS to be released on February 28, but it could be later so a commitment to the Habitat Committee would have to depend on the release of the draft EIS. I suggested that we could present the results at the April meeting of PSMFC which would be in Vancouver WA. and that would also avoid travel, which we do not do because we do not have adequate budget. PFMC agreed that they understood that there would be no March presentation if the draft EIS was not released before the meeting. Subsequently I learned that one of the CSS Oversight Committee members was going to be at the PFMC for other reasons. I asked if he would present the CSS analyses to the Habitat Committee as an efficient use of time and funds. He agreed.

This presentation is a very good, clear and accurate presentation of CSS analytical results that have been submitted to the action agencies in the CRSO-EIS process. This is a clear depiction of the CSS analyses. We provided the federal action agencies with the best data analyses that we could so that they could make informed decisions. This presentation is an excellent simplified presentation of the analyses we provided the action agencies put in terms that are easy to understand. We did so consistent with the non-disclosure agreement they did not become public and were not submitted to the ISAB until after the draft EIS is released. Feel free to direct any other questions you may receive from BPA or the USACOE directly to me if they have concerns about the analyses.

Michele DeHart, Manager

The Fish Passage Center

503-380-8068

From: Randy Fisher [mailto:RFisher@psmfc.org]
Sent: Friday, March 6, 2020 11:12 AM
To: Michele Dehart <mdehart@fpc.org>
Subject: FW: CSS presentation

From: Ball,Crystal A (BPA) - EW-4 <caball@bpa.gov>
Sent: Friday, March 6, 2020 8:41 AM
To: Randy Fisher <RFisher@psmfc.org>
Subject: CSS presentation

CSS metrics, models, and CRSO alternatives

Comparative Survival Study (CSS)

- Initiated in 1996
- Large-scale monitoring program using Passive Integrated Transponder (PIT) tags
- Oversight Committee with representatives from ODFW, WDFW, IDFG, CRITFC, USFWS, and Fish Passage Center
- Summarizes fish performance metrics (e.g., survival, travel time, Smolt-to-Adult Return rates (SARs)) for salmon and steelhead throughout the Columbia River Basin
- Develop models to evaluate sources of variation in fish performance
- Produces Annual Reports reviewed by ISAB and the region

2011 CSS Workshop

1) Synthesize information on the relative importance of freshwater and marine factors on survival rates of salmonids in the basin.

2) Develop tools to evaluate and optimize FCRPS operations to meet established NPCC objectives for listed Snake River and upper Columbia River salmon and steelhead SARs.

The Northwest Power and Conservation Council (NPCC 2003, 2009, 2014) adopted a goal of achieving overall SARs (including jacks) in the 2%–6% range (4% average; 2% minimum) for federal ESA-listed Snake River and upper Columbia River salmon and steelhead.

2013 CSS Workshop

1) Review a draft design for a management experiment to increase the amount of voluntary spill at various FCRPS projects and determine the effects of the experimental action on juvenile in-river, ocean, smolt-to-adult, and returning adult survival rates of PIT-tagged salmon and steelhead.

2) Provide recommendations to strengthen the following components of the experiment: rationale for the experiment; proposed experimental design; implementation options; plan for monitoring both survival and the covariates that potentially affect survival; and data analysis plan.

August 6, 2013 PFMC letter on NPCC F&W Program recommending a study to test the efficacy of higher spill levels to increase SARs

CSS Oversight Committee response to ISAB

May 12, 2017

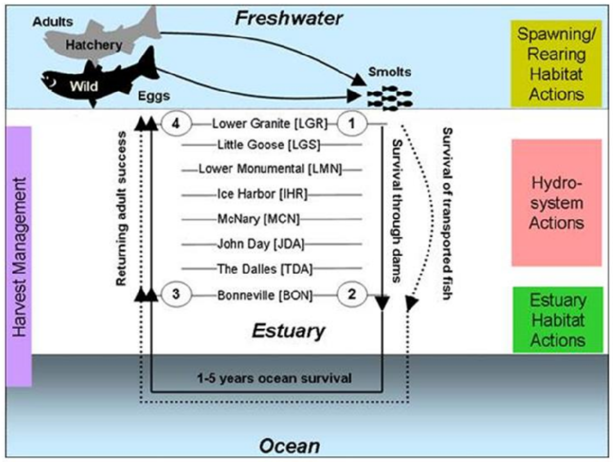
Chapter 3: Describes PIT tag based "cohort" models and annual Transport : In-river Ratio models

Chapter 6: Apply cohort models to evaluate scenarios
- Three representative water years (2009, 2010, 2011)
- Four scenarios (BiOp, 115/120%, 120%, 125%)

CSS 2013-2017 Annual Reports

Chapter 2: Describes Life-Cycle Model for six spring Chinook populations in Grande Ronde / Imnaha Major Population Group

- Three representative water years (2009, 2010, 2011)
- Eight scenarios (BiOp, 115/120%, 120%, 125%, breach)



Cohort Model Response Metrics:
(Snake River yearling Chinook and steelhead)

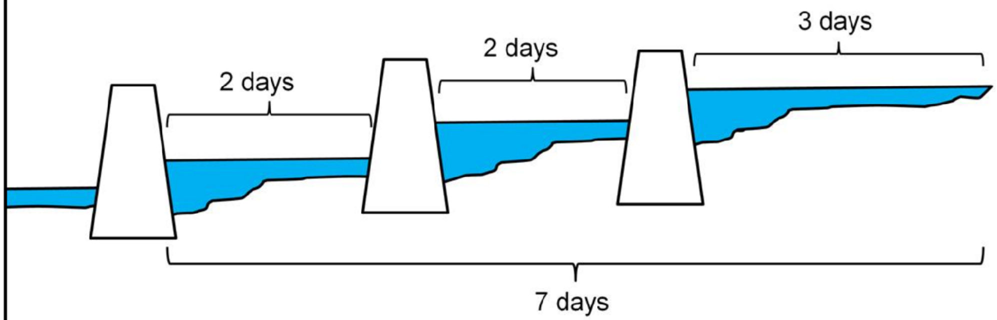
- Juvenile fish travel time
- Juvenile survival
- Ocean survival
- Smolt-to-Adult Return
- Transport:In-river Ratio

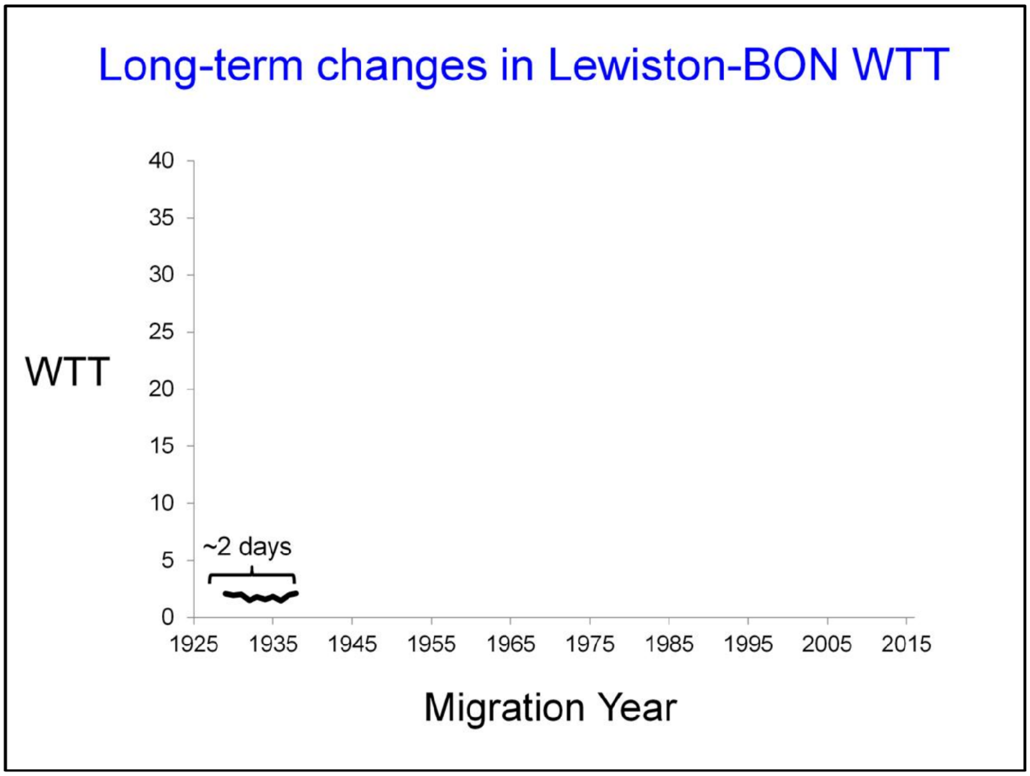
Life Cycle Model Response Metrics:
(Six Grande Ronde/Imnaha spring Chinook populations)

- Smolt-to-Adult Return
- Spawner Abundance

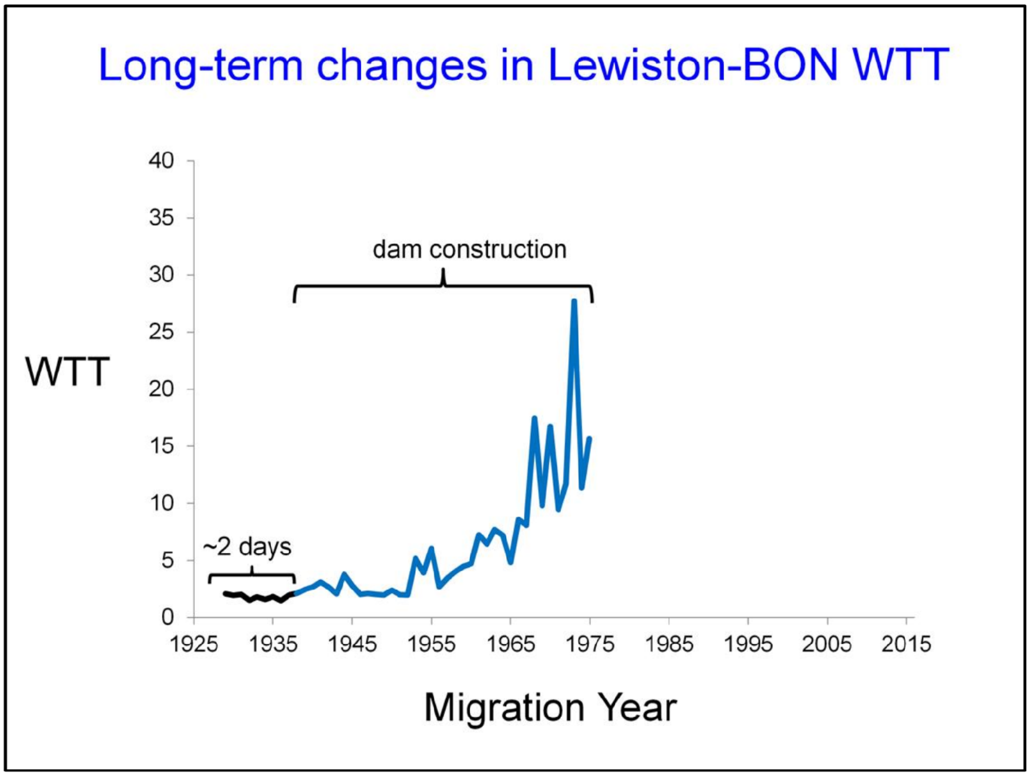
Water Transit Time (WTT)

Estimate of the number of days required for average water particle to transit a reservoir (volume/flow)

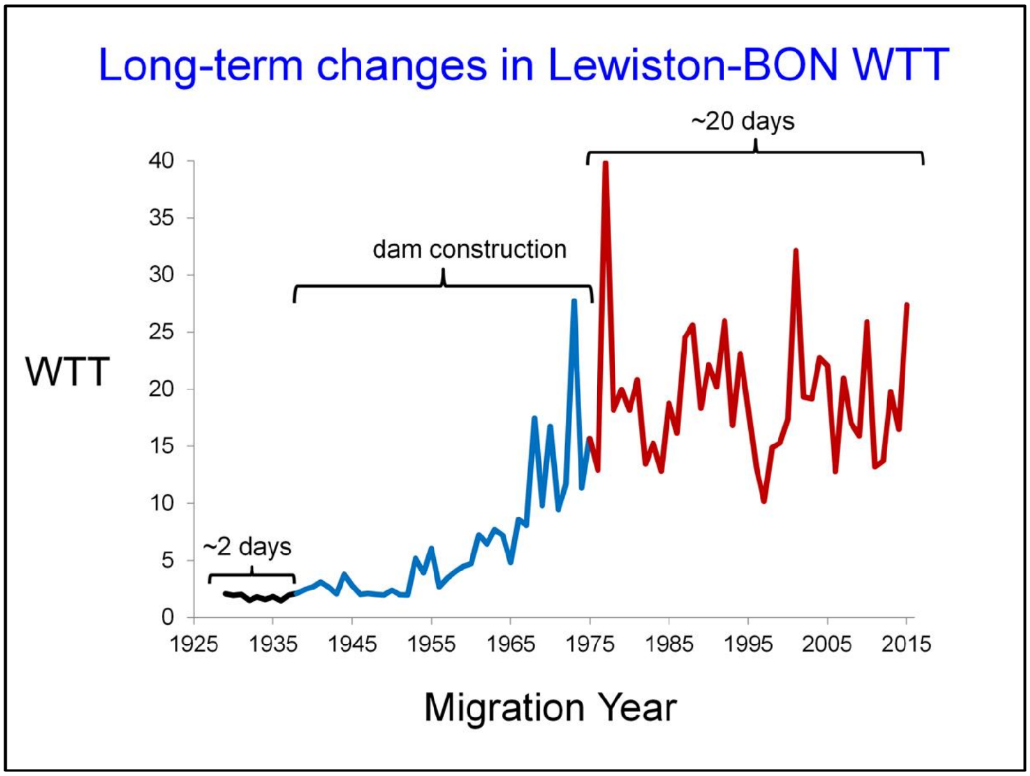




Long-term changes in Lewiston-BON WTT
WTT
40
35
30
25
20
15
10
5
0
~2 days
1925
1935
1945
1955
1965
1975
1985
1995
2005
2015
Migration Year



Long-term changes in Lewiston-BON WTT
WTT
dam construction
~2 days
40
35
30
25
20
15
10
5
0
1925
1935
1945
1955
1965
1975
1985
1995
2005
2015
Migration Year


Long-term changes in Lewiston-BON WTT
~20 days
dam construction
~2 days
WTT
40
35
30
25
20
15
10
5
0
1925
1935
1945
1955
1965
1975
1985
1995
2005
2015
Migration Year

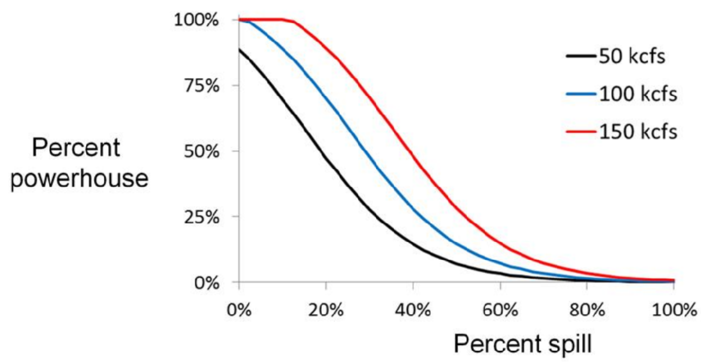
Characterizing fish passage through dams

PowerHouse passage experiences (PITPH)

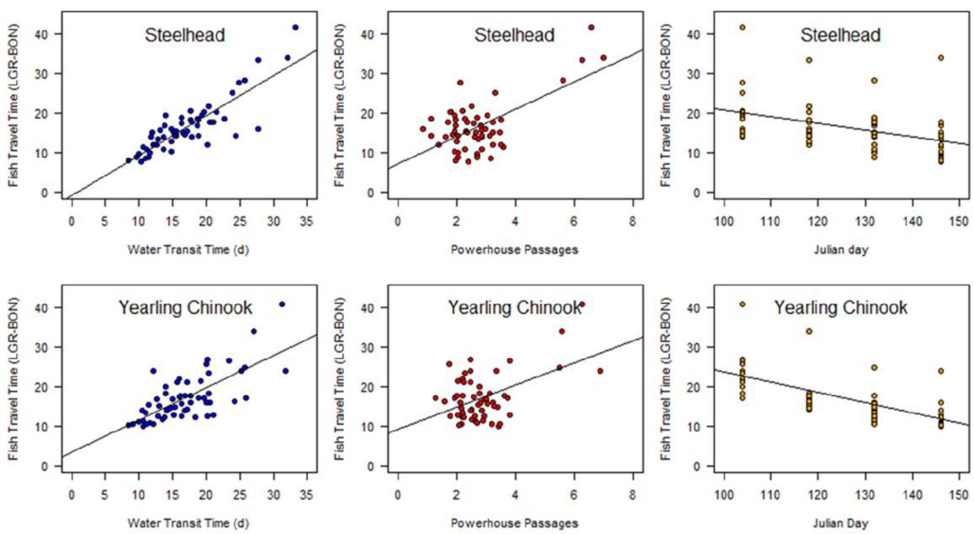
Incorporates spill proportion, flow, and spillway surface passage

Powerhouse = Turbines + collection/bypass system

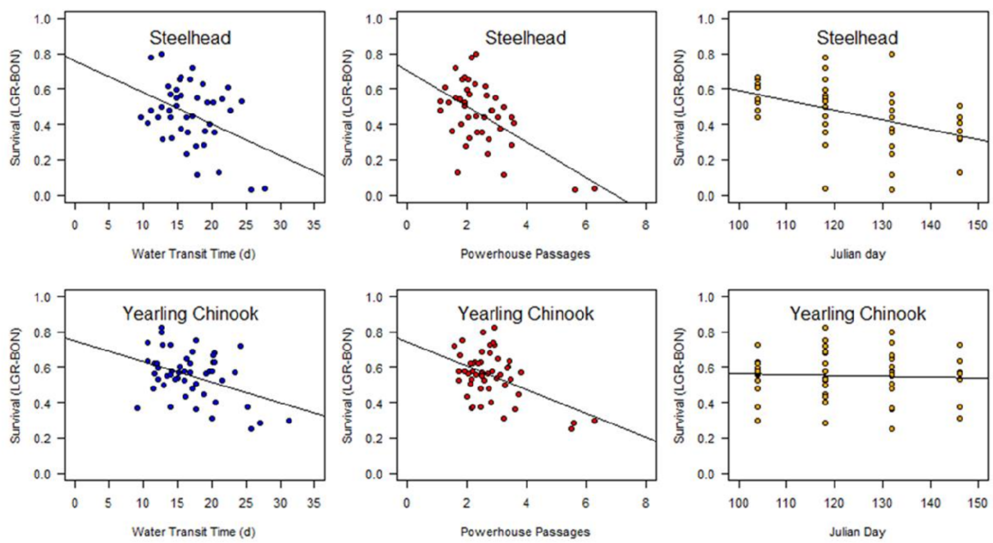
Spillway = 1 - Powerhouse

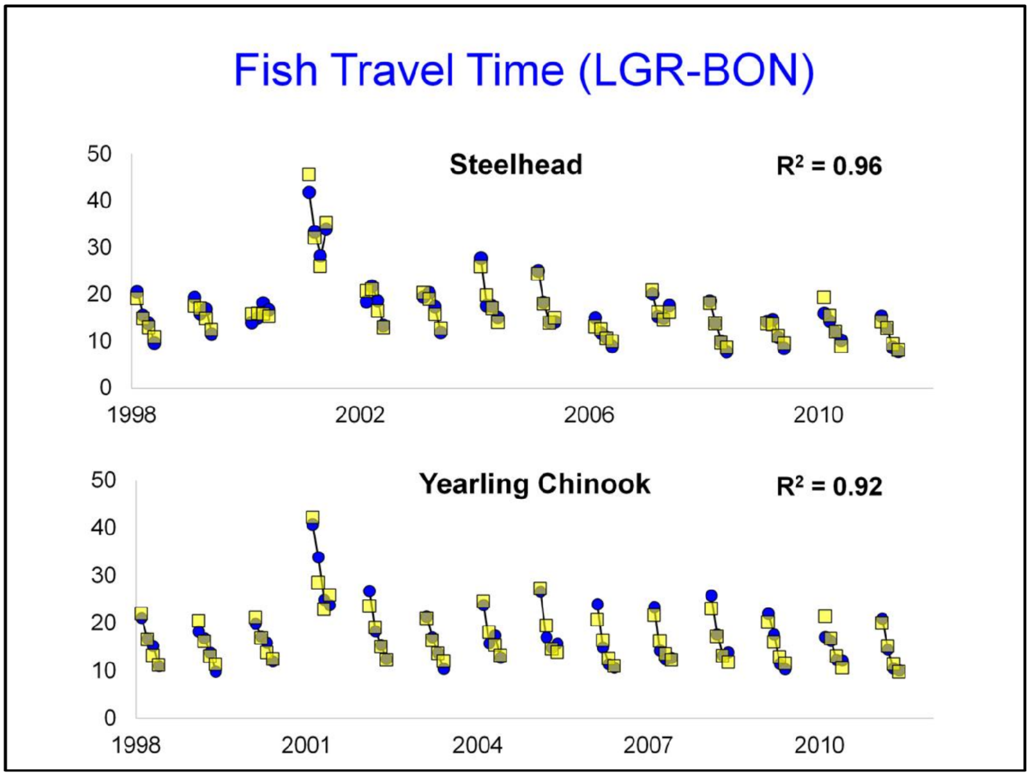


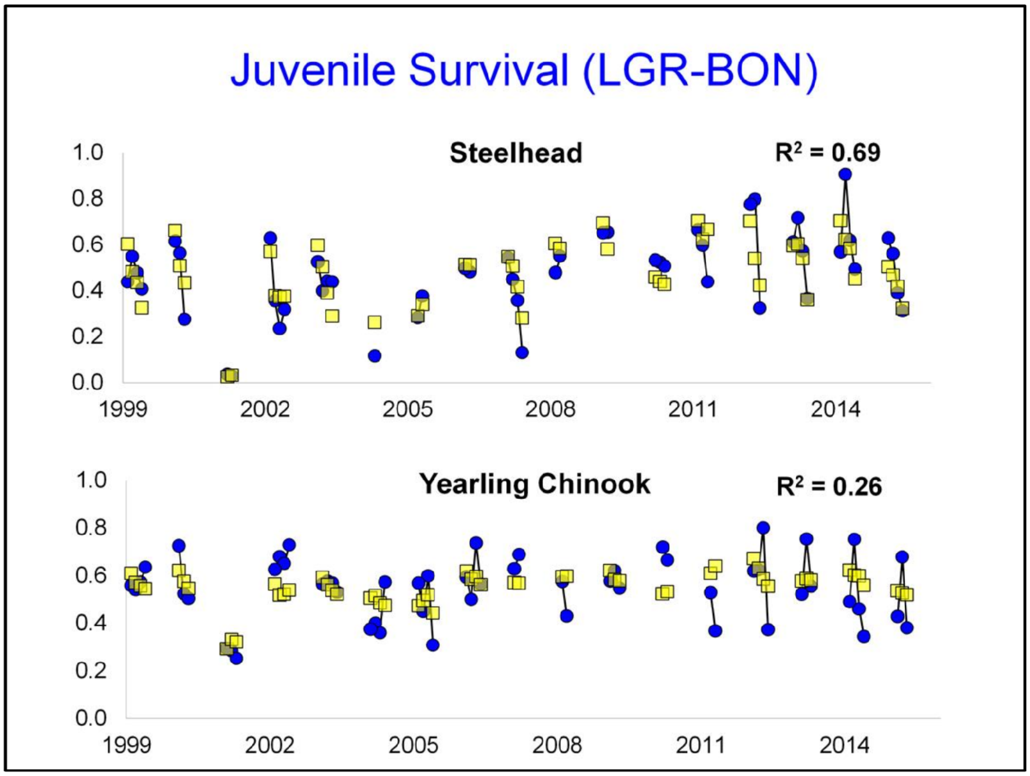
Fish Travel Time



Survival


Steelhead
Steelhead
Steelhead
Yearling Chinook
Yearling Chinook
Yearling Chinook
Survival (LGR-BON)
Water Transit Time (d)
Powerhouse Passages
Julian day
Julian Day


Fish Travel Time (LGR-BON)
Steelhead
R² = 0.96
50
40
30
20
10
0
1998
2002
2006
2010
Yearling Chinook
R² = 0.92
50
40
30
20
10
0
1998
2001
2004
2007
2010

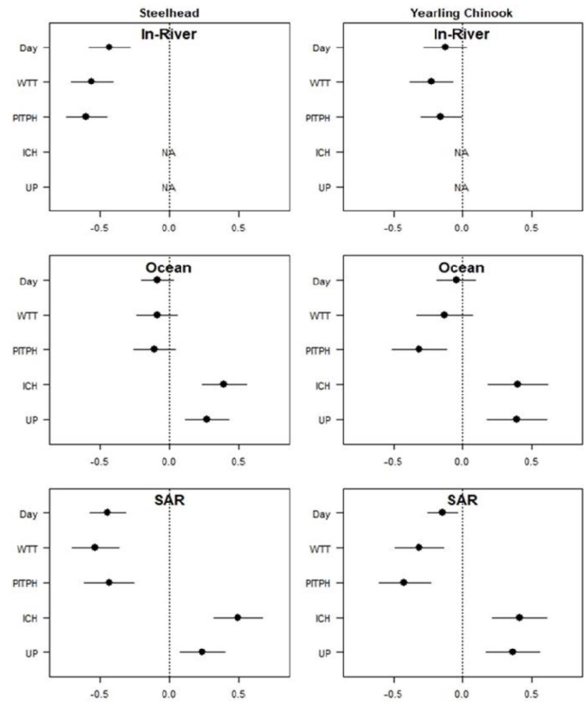


Juvenile Survival (LGR-BON)
Steelhead
R^2 = 0.69
1.0
0.8
0.6
0.4
0.2
0.0
1999
2002
2005
2008
2011
2014
Yearling Chinook
R^2 = 0.26
1.0
0.8
0.6
0.4
0.2
0.0
1999
2002
2005
2008
2011
2014

Environmental and Management Factors:

- Seasonality (cohort models)
- PITPH (proportion spill)
- Water transit time (WTT, days)
- Ocean Indices: Upwelling, Forage Biomass, Pacific Decadal Oscillation (PDO)

Factors associated with survival at each life stage:



CSS Scenarios Evaluated 2013-2017:

Current dams	Breach LSR dams
BiOp spill	BiOp spill
115%/120%	115%/120%
120%	120%
125%	125%

CRSO draft EIS Alternatives

Scenario	Brief Description	Spring Spill	Summer Spill	Start of Transport	Powerhouse Surface Passage Routes	Fish Friendly Turbines
NAA	2016 FOP	2016 FOP	to Aug 31	May 1st	None	IHR, MCN
MO1	Block Design	Performance vs. 115%/120%	Performance Spill. Terminated as early as Aug. 1	April 15th	IHR, MCN	IHR, MCN, JDA
MO2	Spill to 110% TDG	110% TDG	110% TDG. Terminated on Aug. 1	April 25th	IHR, MCN, JDA	IHR, MCN, JDA
MO3	Breach Snake, 120% TDG in Mid-Columbia	120% TDG, not to exceed 150 Kcfs at BON	120% TDG, not to exceed 150 Kcfs at BON. Terminated on Aug. 1	None	MCN	MCN
MO4	125% TDG spill	125% Spill cap. Spring spill starts on March 1st	125% Spill cap, through Aug 31	April 25th	LGR, LGS, LMN, IHR, MCN, JDA	IHR, MCN, JDA
PA	2020 Flex Spill Agreement with potential for Adaptive Management	2020 Flex Spill levels	To Aug. 31, Performance spill through Aug 14, reduced from Aug 15-31.	April 20th but could occur as early as April 15th	None	IHR, MCN, JDA

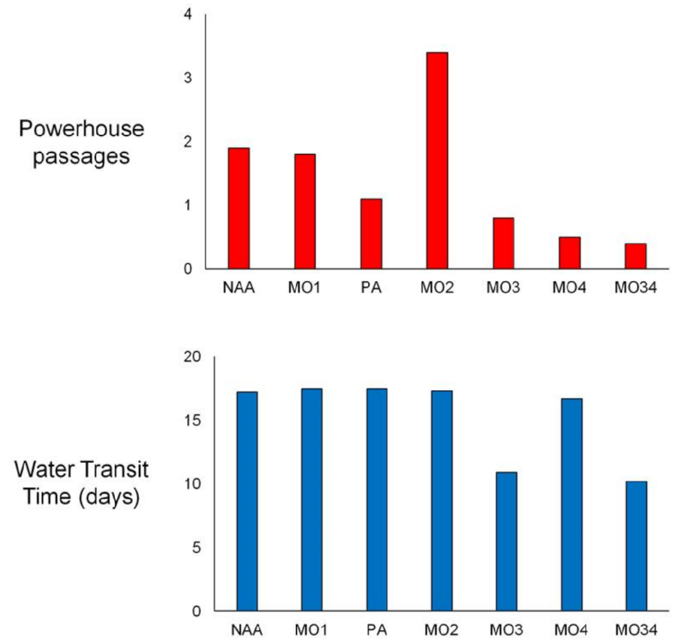
CSS Scenarios Evaluated for CRSO:

MO2 110%

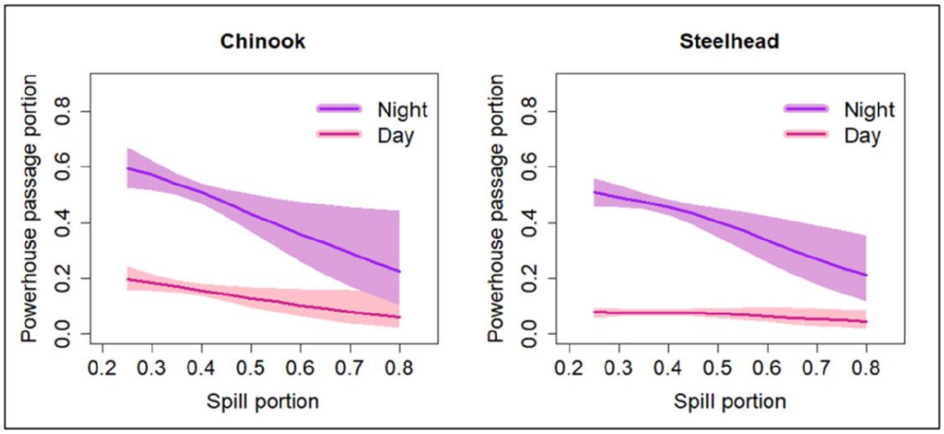
	Current dams	Breach LSR dams	
NAA	BiOp spill	BiOp spill	
MO1	115%/120%	115%/120%	
PA	120%	120%	MO3
MO4	125%	125%	MO34

80-year water record provided by the Action Agencies

Effects of the Alternatives on freshwater environment



PA: Flex-spill can impact powerhouse passage, depending on timing

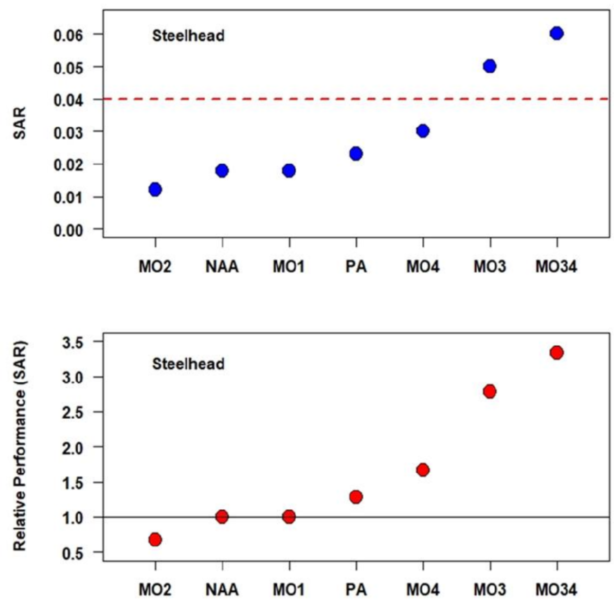


Results

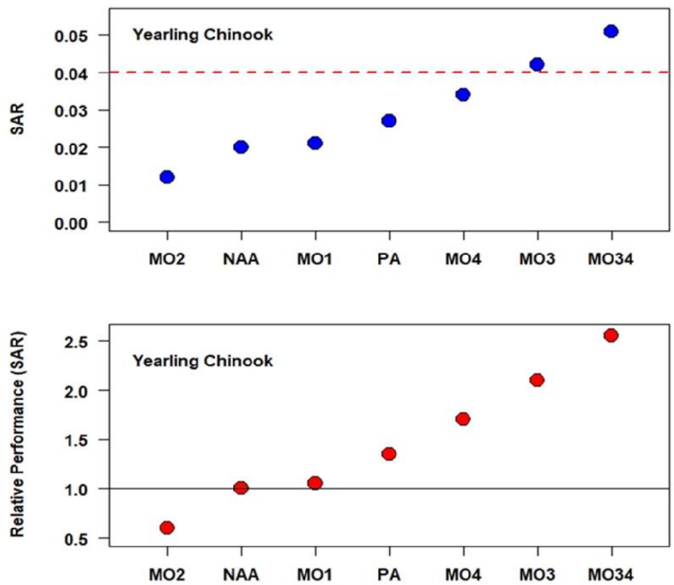
Summarized means of each biological performance metric, by each alternative

Summarized performance relative to NAA (e.g. MO1/NAA)

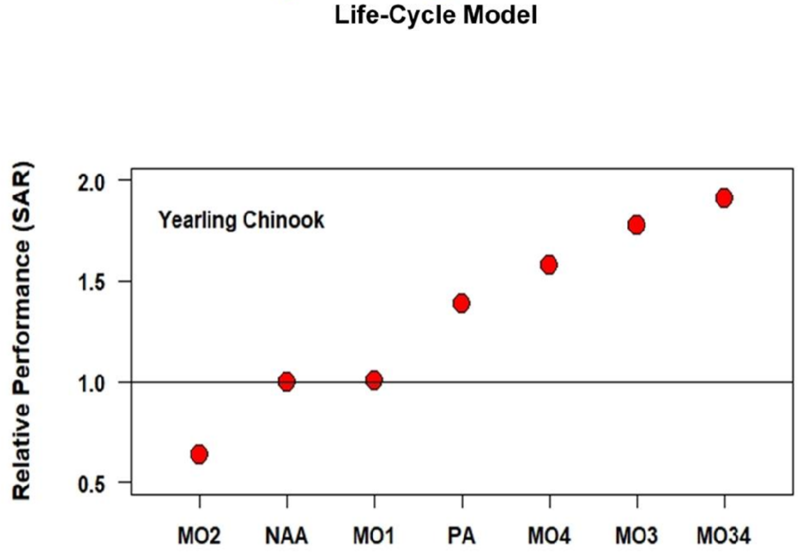
Results: steelhead SARs



Results: yearling Chinook SARs

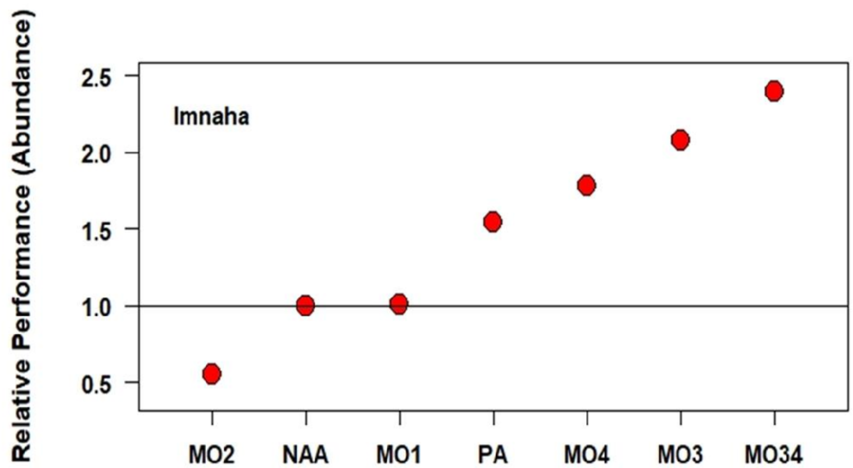


Results: yearling Chinook SARs



Results: Spawner Abundance

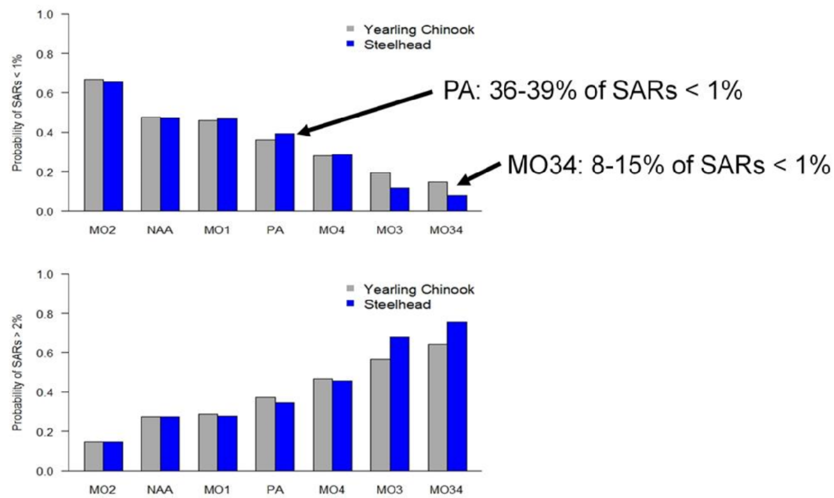
Life-Cycle Model



Quantifying risks and desired outcomes

SARs < 1% associated with population declines

SARs > 2% associated with population increases (also NPCC minimum SAR goal)



Conclusions

- MO2 consistently resulted in poor biological performance

- MO3 and MO4 consistently demonstrated the greatest improvements in biological performance relative to the NAA

- MO3 and MO4 were the only two alternatives that may be capable of achieving the NPCC average SAR goal of 4% (MO3 above, MO4 near, both ranges overlap 4%)

- CSS alternative MO34 outperformed the federal alternatives

- PA results may be overly optimistic:
  - Flex spill allows decreased spill during night
  - High-capacity turbines
  - Allows drafts below flood control

From: Doumbia,Julie A (BPA) - EC-5

Sent: Wed May 22 09:10:08 2019

To: Michele Dehart; Art Martin; Jay Hesse (jayh@nezperce.org); Adam Storch (adam.j.storch@state.or.us)

Cc: Steve_Haeseker@fws.gov; Robert Lessard (LESR@critfc.org); Jerry McCann; Brandon Chockley; Joy Juelson; Thomas C. Christian; Chuck Chamberlain (NWW); Sue Camp (scamp@usbr.gov)

Subject: RE: Presentation April 29 CSS modellig analses of CRSO alternatives

Importance: Normal

Attachments: CRSO CSS modeling questions.docx

Great, thanks Michele. It's been quite variable in amount of time for questions – generally we've budgeted about 20-30 mins for questions following presentations, but it varies quite a bit.

Also, attached are some early questions we have been collecting internally from a few of the co-lead staff – if some of these can be incorporated into presentations next week, that would be great, and the balance would be great to work through with you afterwards – we're flexible. As we're putting together the documentation for modeling results, these are some of the details that have cropped up that we think we'll need to clarify for the draft EIS.

Thank you again,

Julie

From: Michele Dehart [mailto:mdehart@fpc.org]
Sent: Wednesday, May 22, 2019 8:33 AM
To: Doumbia,Julie A (BPA) - EC-5; Art Martin; Jay Hesse (jayh@nezperce.org); Adam Storch (adam.j.storch@state.or.us)
Cc: Steve_Haeseker@fws.gov; Robert Lessard (LESR@critfc.org); Jerry McCann; Brandon Chockley; Joy Juelson; Thomas C. Christian
Subject: [EXTERNAL] RE: Presentation April 29 CSS modellig analses of CRSO alternatives

Julie:

We need 40 minutes total, we will be presenting the life cycle model analyses and the cohort model analyses of all of the CRSO alternatives.

Thanks

Michele

From: Doumbia,Julie A (BPA) - EC-5 [mailto:jadoumbia@bpa.gov]
Sent: Wednesday, May 22, 2019 6:32 AM
To: Michele Dehart; Art Martin; Jay Hesse (jayh@nezperce.org); Adam Storch (adam.j.storch@state.or.us)
Cc: Steve_Haeseker@fws.gov; Robert Lessard (LESR@critfc.org); Jerry McCann; Brandon Chockley; Joy Juelson; Thomas C. Christian
Subject: RE: Presentation April 29 CSS modellig analses of CRSO alternatives

Excellent news, thank you Michele for confirming – I'm copying Thomas Christian and Joy Juelson, who are helping to assemble the agenda that morning.

Yes, this meeting will have both in person (Portland) and webex options, as in the past, and format-wise should plan for your 20 min presentation and some Q&A. If you have a preference for holding questions until the end or presenters taking them during the presentation, that's helpful to communicate to Joy beforehand so she can help manage that for you. If you plan to be remote v in-person, that's helpful to know too.

Thank you again for confirming!

Julie

From: Michele Dehart [mailto:mdehart@fpc.org]
Sent: Monday, May 20, 2019 11:19 AM
To: Doumbia,Julie A (BPA) - EC-5; Art Martin; Jay Hesse (jayh@nezperce.org); Adam Storch (adam.j.storch@state.or.us)
Cc: Steve_Haeseker@fws.gov; Robert Lessard (LESR@critfc.org); Jerry McCann; Brandon Chockley
Subject: [EXTERNAL] Presentation April 29 CSS modellig analses of CRSO alternatives

Hello Julie:

I have finally gotten a response from the CSS representatives this morning. CSS representatives will present CSS modelling results of CRSO alternatives. The CSS presentations will be made by Bob Lessard and Steve Haeseker, they will each need 20 minutes to present modelling results to the group.

I assume that this presentation will follow the webinar format of other modelling team presentations. Please send any information we need to facilitate the presentation.

Thank You

Michele DeHart, Manager

The Fish Passage Center

503-833-3901

Follow-up CSS Results Memo (CRSO-24) Questions

Request for FPC written responses: if responses are in written form, please provide page number and paragraph in the response. Citing large documents for responses without a specific page reference can be very time consuming and sometimes we are still unable to locate the specific information the response indicates should be located somewhere in a lengthy report.

Considering that we need to make all the fish analyses as easy to digest as we can for the general public, do you have a diagram available that represents the mechanics (variables and work flow) the CSS numerical model used for the CRSO analysis? From the memo documentation provided, it is still challenging to understand the approach taken for CRSO and how much is the same/different from past CSS analyses, which are quite complex with many different statistical analyses that the majority of fish biologists would not understand without serious investment in statistics and numerical modeling. Some fish biologists have this, some do not. For transparency and clear communication purposes, ideally the numerical model should have documentation available with sufficient information that the model could be independently re-constructed and run, i.e., methods are repeatable by an independent party. This is not a requirement, but we would find this very helpful as a communication tool and one we have not seen in other CSS documentation.

Below are several questions specific to technical details of the CSS results in memo CRSO-24:

1. PITPH and SARs
    a. Powerhouse passage proportion was not included numerically for NAA, MO1-MO4 and was a metric in the planned CRSO results tables (see e-mail sent Dec 10, 2018). Could you please provide this metric for your analyses as well, noting that this was produced in your memo as a figure (Figure 1), so we assume it should be straightforward to provide in table format as well. PITPH listed by individual years over 80 years is fine too, if that's easier for you.
        i. PITPH presumably changes for chinook versus steelhead – which is Figure 1? There isn't a label, and assuming it differs for these two species, will a similar result be provided for the second species?
    b. If PITPH was greater in MO4 than MO3 (looks that way from memo CRSO-24 Figure 1 on memo p. 6), what overriding factor increased SARs to the degree that MO3 SARs are higher than MO4 (FPC memo Table 17 for both Chinook and steelhead)? Was it WTT, or another mechanism?
    c. Why do some of the individual products of the inriver survival (Table 14) and ocean survival (Table 16) fall so far short of the SARs (Table 17)? In the steelhead analyses in particular, it is curious how more fish would return to Lower Granite (or higher in the system) than return to Bonneville dam. (It is unclear in the memo where the SAR endpoint for adults is measured and this detail is also needed.) Specifically for steelhead in MO3, why is the SAR from LWG (juvenile) to BON (adult) ~3.3% (product from Table 14 x Table 16) and the SAR in Table 17 even higher, at 5%? I.e. why are adult returns increasing by 50% after Bonneville Dam?

	NAA	MO1	MO2	MO3	MO4		NAA	MO1	MO2	MO3	MO4
Juvenile Inriver S (LWG-BON)	57.6%	58.3%	53.7%	68.2%	63.5%		57.1%	58.8%	44.4%	83.1%	73.7%
Ocean S (BON-BON)	3.6%	3.9%	2.8%	6.0%	5.7%		2.9%	3.0%	2.5%	4.0%	3.6%
LWG-BON S	**2.1%**	**2.3%**	**1.5%**	**4.1%**	**3.6%**		**1.7%**	**1.8%**	**1.1%**	**3.3%**	**2.7%**
Memo SAR (LWG-LWG?)	2.0%	2.2%	1.4%	4.3%	3.5%		1.8%	1.9%	1.3%	5.0%	3.1%
Unaccounted for Difference between LWG-BON S and Memo SAR, e.g. Mainstem Adult S (BON-LWG)?	96.5%	96.8%	93.1%	105.1%	96.7%		108.7%	107.7%	117.1%	150.4%	116.8%

d. MO4 CSS results average 3.5% and 3.1% (Table 17) so it is unclear how MO4 is meeting the 4% SAR goal in the FPC summaries of CSS results as stated on p. 3 of the memo CRSO-24. Clearly 3.5 and 3.1 < 4.0, and it is unclear what criteria FPC is using to qualify that assessment.

e. Please confirm the following routes are categorized accurately below for the CSS modeling assumptions (follow-up to Question 2 response in memo CRSO-11):

Dam passage route	CSS PITPH	CSS Non-PITPH	CSS Criteria for Assigning PITPH or Non-PITPH (important for SAR implication)
Turbines: • Existing • Improved Fish Passage Turbines (IHR, MCN, JDA)	X ?		[lower direct route survival?] [?]
Fish Bypasses	X		2015 CSS Report p. 475: Several research studies have found that juvenile fish that enter the smolt collection system and are bypassed experience substantial migration delay (Tuomikoski et al. 2010) and have reduced survival at later life stages (Tuomikoski et al. 2010, Buchanan et al. 2011, McMichael et al. 2010).
Ice and Trash Sluiceways (TDA, BON1)	X		FPC memo 44-17 (p. 11): Response to Question 3 for The Dalles dam (presumably same for BON PH1 ITS?): 1) smolts enter the ITS in a similar manner as smolts entering bypass systems at the other dams, [comment: ITSs are surface overflow weirs, not deep like bypass entrances] 2) smolts exiting the ITS follow a similar route in the tailrace as smolts that pass through the turbines, 3) smolts that use the ITS have similar tailrace egress times as smolts that pass through the turbines, and these tailrace egress times are approximately double those of smolts that pass via the spillway (Johnson et al. 2007), and 4) smolts that exit the ITS pass near or through zones of high predator (northern pikeminnow and smallmouth bass) density in the tailrace (Duran et al. 2003), and this predator exposure is expected to be similar to smolts that pass through the turbines.
New Powerhouse Surface Passage (PHSP) Structures	?		Based on criteria above, criteria 2, 3, and 4 suggest these PHSP measures would be assigned to a non-PITPH route since the outfalls are near the spillways. However, the PHSP entrances would be similar to ITSs (surface overflow weir). Is this assumption correct in how the CSS model categorized PHSPs?

Bonneville PH2 Corner Collector		X	FPC memo 44-17 (p. 11): Smolts that exit the corner collector at Bonneville Dam enter into the same area as smolts that pass through the spillways, unlike the ITS where smolts enter areas directly adjacent to the turbine outfalls.
Spillways		X	Relative higher SAR than bypass routes…

2. Confidence Intervals
    a. Where possible, please provide the 5%/ 95% and/or 25%/ 75% confidence intervals for your CRSO results or explain why you used the confidence interval you selected. Magnitude of variability is important to understand the magnitude of uncertainty in estimated parameters and inherent variability in environmental and fish datasets.
    b. Where confidence intervals are not available, please explain why not available, i.e. deterministic.
3. Methods
    a. Why were the SAR and return abundance methodologies calculated differently from the methods in the 2017 CSS Annual Report, as described in CRSO-24 memo p. 7 paragraph 2? There is a mention that a different method was used and we would like to understand why the method deviated from past practice.
    b. Could you further explain what you mean by WTT and PITPH were held constant every year for each alternative in the 2017 CSS analysis (p. 5 CRSO-24)? Do you mean just within water year types in the 2017 CSS analysis? More explanation would be helpful here.
    c. Transported fish – since you mention that there is a difference in how transported fish are handled in CRSO evaluations relative and the 2017 CSS Report, please send a table of average and /or median transport rates per alternative and discussion of how that differs from the scenarios from your 2017 CSS Annual Report to better understand magnitude of that change in modeling assumptions.
    d. Why is harvest treated as a random draw from historic harvests (CRSO-24 memo p. 7), rather than using the US v Oregon harvest tables and adult abundances, or a fixed value so all years are treated the same for harvest assumptions?
    e. Do SARs in CRSO-24 (Table 17) include transported fish and jacks? The 2017 CSS Annual Report (the memo reader is directed to this 834 page report for the majority of the methods) states "in [Chapter 4] we present estimates of overall Chinook SARs with jacks included and the CSS standard reporting statistic of SARs with jacks excluded. Most other Chinook analyses in this and previous reports, are based strictly on adults (age 2-salt and older)" (p. 96). Please provide a few more details on how the specific SARs in Table 17 were calculated and what assumptions we need to document in the EIS. The NPCC SAR objective includes jacks, so if the comparison of CSS results is made to that objective, then jacks would need to be included in the CSS memo CRSO-24 results and we're unclear if that is the case or not.
    f. What is the timeframe for the future abundance estimates? I.e. how many years into the future?
    g. Are tributary habitat assumptions consistent with CSS 2017 CSS annual report and could you briefly clarify those assumptions?
4. Relationships
    a. On CRSO-24 page 5, there is a statement that WTT is not sensitive to surface passage efficiency. Is this true for fish travel time (FTT) in the CSS model as well? I.e. that the CSS model is not sensitive to change in fish travel time from installation of additional surface passage?
5. Specific Fish Stocks
    a. Will FPC/CSS group be sending analysis for upper Columbia fish as well?
6. Specific results

a. Just a note that we have had requests to display datasets by low-average-high flow years as well and we will get you a list of the years in the 80 year dataset that fall into these three categories. Since you have done the analysis for the 80 years, we assume this will be relatively straightforward for you, but please let us know if this will be an issue.

b. What is meant by the following statements and could you clarify:

   i. "The CRSO multi-objective MO4 predicts the same performance at approximately a 4.5% SAR" (p. 8) but the SAR summary table (Table 17) does not include any MO4 SAR values for either Chinook or steelhead that are 4.5% SAR.

   ii. On p. 8 that "CRSO MO3 is roughly equivalent in nature to CSS 120%. Both predict SARs of approximately 5%." Is the suggestion that spill to 120% across all eight LSN/LCOL dams equivalent to lower Snake dam breach and spill to 120% in the lower river, in terms of absolute SARs?

7. Datasets: Temperature

   a. The co-lead agencies were informed that the CSS modeling only required H&H datasets and did not use water quality in modeled CSS outputs. If the CSS model required water quality datasets as an input, then the CSS group would need to use the 80 year Corps-supplied water quality CRSO datasets for each CRSO alternative.

   b. At the 2018 CSS Annual meeting (April 2019) and in the 2017 CSS Annual Report, it was clear that temperature was a predictor of CSS metrics, but it is unclear what the relative importance values are relative to (see 2017 CSS Annual Report p. 79 figure below).

   c. In your memo (CSS-24), it states that the "replication of [the 2017 CSS Annual Report] analyses using CRSO inputs was performed by substituting the 2017 CSS scenario PITPH and WTT annual constants with a time series of PITPH and WTT derived from the 80 year time series of hydrosystem metrics predicted by CRSO hydro modeling" (p. 4). In essence, the only change between the previous model runs for the 2017 CSS Annual Report and the CRSO modeling were different values for PITPH and WTT? I.e. the CRSO water quality team's temperature assumptions would differ from the temperature assumptions in the 2017 CSS annual report runs. Said another way, the temperature assumptions for the CSS runs for CRSO would differ from the temperature assumptions for the rest of the CRSO water quality and fish modeling, if we are understanding your method correctly?

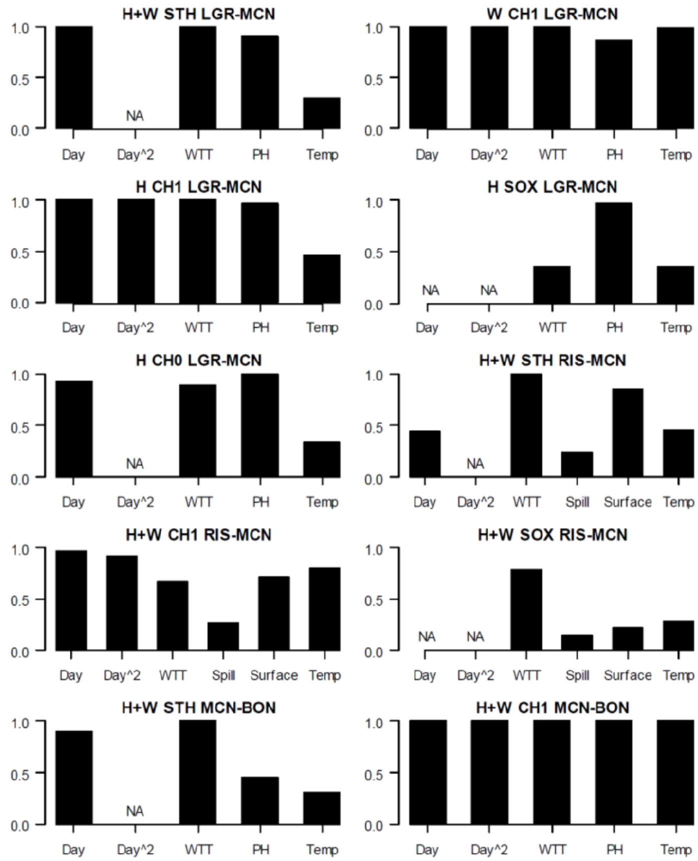


Figure 3.5 Relative variable importance values (y-axis) for fish travel time (FTT) models on release cohorts of hatchery (H) and wild (W) steelhead (STH), yearling Chinook salmon (CH1), subyearling Chinook salmon (CH0), and sockeye salmon (SOX) in the LGR–MCN, RIS–MCN and MCN–BON reaches, 1998–2016. Model variables included: Julian day of cohort release (Day), the quadratic effect of Julian day of cohort release (Day^2), water transit time (WTT), powerhouse passage (PH), average spill proportion (Spill), the number of dams with spillway surface weirs (Surface), and water temperature (Temp). NA represents variables that were not fit in the model for that species and reach.

From: Michele Dehart

Sent: Thu Jul 11 13:08:40 2019

To: Doumbia,Julie A (BPA) - EC-5

Subject: [EXTERNAL] Comments Draft EIS chapter 3 - steelhead

Importance: Normal

Attachments: CRSO-46.pdf

Julie:

Attached are the FPC/CSS comments on the Draft CRSO EIS Chapter 3 – Steelhead which you distributed to us for review.

Thank you for the opportunity to review the draft.

Please let us know if you have questions.

Michele DeHart, Manager

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MEMORANDUM

TO: Julie Doumbia, BPA

(b) (6) [redacted]

FROM: Michele DeHart

DATE: July 11, 2019

RE: Review of Draft CRSO Chapter 3 – Environmental Consequences, 3.4.3.1 - 3.4.3.2 Modeling – 3.4.5.1.1.1.1.1- Steelhead

In response to your request, the Fish Passage Center (FPC) staff and the Comparative Survival Study (CSS) Oversight Committee reviewed the draft section of Chapter 3, which you provided by email on July 2, 2019. This is a partial and rough draft of Chapter 3 (Draft), which only includes results for steelhead. We have developed these comments according to your instructions (attached), only comment and review the components that the FPC/CSS have developed. We do have comments on the other components of this draft but will reserve them for submittal at a later time as per your instructions. We offer the following review comments and recommendations for your consideration in development of the ensuing draft of Chapter 3 of the CRSO EIS.

General Comments

The FPC and the CSS Oversight Committee carried out extensive analyses of the Action Agencies' CRSO Environmental Impact Statement (EIS) Alternatives and provided those analyses to the action agencies on April 29, 2019. These included the Grande Ronde watershed life-cycle model analyses for spring Chinook and a suite of cohort model analyses that utilize all Snake River population mark groups for both yearling Chinook and steelhead.

The current Chapter 3 Draft does not accurately reflect CSS/FPC analyses. Many important component results of those analyses were omitted or mischaracterized in the Chapter 3 Draft. Specifically, the following results of analyses were omitted or mischaracterized:

- Predicted smolt-to-adult return rates (SARs) from the CSS cohort models (mischaracterized as being from the CSS LCM model)
- Predicted ocean survivals for the cohort models (omitted)
- Predicted Transport:In-river ratios (omitted)

While metrics like juvenile survival, juvenile travel time, and powerhouse passage events are included in both the written and tabular presentations in the Chapter 3 Draft, the predicted ocean survival rates and Transport:In-river ratios from the cohort model analyses for each CRSO alternative are not included in the current draft. Furthermore, predicted smolt to adult rates (SARs) are mischaracterized as being from the CSS LCM. These results were actually from the cohort model and apply to hatchery and wild steelhead. These predicted smolt-to-adult return (SAR) rates are an extremely important metric for evaluating the relative efficacy the EIS alternatives. In addition, the region has adopted a goal of SARs averaging 4% for listed Snake River and Upper Columbia salmon and steelhead (NWPCC 2014). Each CRSO alternative should be considered relative to each other and relative to that regional goal by presenting the predicted SARs and the ranges around those SARs for each alternative. The 25% - 75% quartile ranges around predicted SARs for the cohort models were provided to the action agencies in document CRSO-33, and submitted to the action agencies on June 14, 2019. The low end of the range of predicted SARs should be given considerable attention, because future climate change conditions could produce SARs at the low end of the range more often than has occurred historically. In fact, the range of uncertainty in model predictions is representative of past extremes, and should therefore be treated as cautionary examples of potential future conditions. We recommend that the draft provide the predicted SARs for the cohort models for each alternative, consistent with the manner that predicted in-river survival rates and fish travel times are provided in the current draft. Providing the predicted SARs in no way precludes, and in fact more clearly supports comparisons of the relative effects of each alternative against the No Action Alternative.

Throughout the Chapter 3 Draft, the results of the CSS cohort models and the Grande Ronde life-cycle model are conflated. The cohort models are representative of all the Snake River populations of Chinook and steelhead. The Grande Ronde life-cycle analyses do not specifically address steelhead. All CSS steelhead analyses are based on the CSS cohort models.

The federal action agencies have selected "proportion transported" as a metric for evaluation of alternatives. In CSS analyses "proportion transported" is not a metric. Furthermore, powerhouse passage encounters (PITPH) is a covariate in CSS analyses that describes spill and surface passage structure operation. PITPH is an input variable to the CSS LCM and CSS cohort models. In predicted results, the action agencies "proportion transported" addresses the disposition of fish once they have entered the powerhouse, (therefore not avoided powerhouse passage) they are either bypassed or transported. PITPH is an index of spill and surface passage operation and a covariate in CSS analyses that describes avoidance of powerhouse passage. All transported juvenile salmon and steelhead must have at least 1 (and up to 3) powerhouse passages to be transported in the present system configuration. In MO2 for instance, transported fish could have a PITPH of 1-4 because a transportation site is added at McNary Dam. The CSS Cohort model does not utilize proportion of fish transported as an input. The CSS cohort model utilizes PITPH as an input. The CSS Cohort model does not generate a proportion transported metric. Based upon ISAB recommendations in 2014, the CSS cohort models address smolt transportation in terms of Transported:In-River (TIR) models. TIR characterizes associations between environmental conditions and the ratio of Smolt-to-Adult Return rates for Transported versus In-River migrants. Previous analyses have shown that TIR declines as juvenile survival rates increase, that is, transportation becomes relatively less effective as in-river conditions improve. Results from the CSS TIR model were provided in the April 29, 2019 submission to the action agencies (CRSO-24).

Several sections of the Chapter 3 Draft are identified by title but no text is provided. Specifically, the title "Juvenile TDG Exposure". Since this section of the Chapter 3 Draft was not available for review, it is not possible to determine if the following analyses, which are directly relevant to this section of the draft EIS, will be included:

- Attached to the June 14, 2019 responses to BPA questions is a report submitted to the ISAB titled "Documentation of Experimental Spill Management: Models, Hypotheses, Study Design and Responses to the ISAB". Chapter 3 of this document includes extensive analyses of the effects of Total Dissolved Gas levels on juvenile salmon and steelhead survival showing no effect on survival of TDG levels up to 125%. These analyses are directly relevant to the EIS Chapter 3 Draft section titled "Juvenile TDG Exposure".
- Chapter 3 of the 2017 and 2018 CSS Annual reports include analyses of the effects of Total Dissolved Gas on survival and instantaneous mortality rates for juvenile Chinook salmon and steelhead. These analyses are also relevant to the section titled "Juvenile TDG Exposure". These analyses are available to the public on the FPC website and should be included in the EIS.

Furthermore, the Chapter 3 Draft for yearling Chinook had a blank section entitled "Qualitative Analyses of Adult Migration/Survival Measures". This steelhead Draft now has a section entitled "Qualitative Analysis of Measures Affecting ***Juvenile*** Migration/Survival" (emphasis added for clarity). It is unclear whether this is a typo or whether there is intent to include a section to discuss qualitative analyses of juvenile migration/survival. What value would qualitative analyses of juvenile migration/survival add to this Draft, given that both the CSS and COMPASS have included quantitative analyses on many juvenile metrics, including travel time and survival? If this is a typo, and the section was meant to be "Qualitative Analyses of Adult Migration/Survival Measures", we would stress that this section include past CSS analyses that are relevant to this topic, including:

- The FPC/CSS and others have completed quantitative analyses of adult salmon and steelhead upstream migration and survival. These quantitative analyses are relevant to the EIS and indicate that water temperature and juvenile downstream passage history, particularly smolt transportation, affect adult upstream migration. These existing quantitative analyses would better inform the CRSO EIS than reliance on qualitative analyses and should be included in the EIS. These are available to the public in the CSS Annual Reports and in individual memorandums on the FPC web site. We are happy to provide these documents to you on request

The CSS cohort model analyses all showed that the proposed Powerhouse Surface Passage (PSP) structures had little to no effect on the performance metrics, but these results are not clear in the Chapter 3 Draft. The Draft should be revised to clearly report these results for all of the CSS analyses.

In each of the sections describing each CRSO alternative, there is a subsection titled *"Life Cycle Models & Consideration of Latent effect of Hydrosystem"*. The discussion in these sections is completely inadequate. The CSS cohort models and the CSS LCM incorporate latent and delayed mortality effects by reporting results in terms of the smolt to adult return metric. Early ocean and estuary survival is incorporated into the CSS analyses of CRSO alternatives.

Specific Comments

In addition to the general comments provided above, we offer the following Specific Comments:

Line 24, page 3-1. The authors have confused the Grande Ronde Life Cycle model and the CSS cohort models, in this discussion. The CSS Grande Ronde Life Cycle model does not address steelhead. The CSS evaluated the CRSO alternatives for steelhead with the CSS Cohort models while analyses for spring/summer Chinook used both the CSS LCM and the CSS cohort model. All of those results were provided to the federal agencies on April 29, 2019.

Line 30 page 3-1, section 3.4.5 Multiple Objective 1

Although there is no text in this section for review, and we expect that an opportunity for review will be provided at a later date, it is important that the descriptions of each alternative are clear and detailed. The block study design included as the central measure in MO1 has been modeled by CSS in a hypothetical manner as if it were possible to implement. There is a significant body of evidence indicating that the block study design which is at the core of MO1, is not implementable in actual operation (FPC memorandum #6-18, February 22, 2018). This is an important consideration in assessing alternatives and model results. However the organization of the EIS at the present time may cause this important distinction to be lost.

Lines 40 -47, page 3-2

The discussion in terms of differences between the NAA and MO1, is cryptic and would be difficult for the public to understand. We recommend that the specific results provided by CSS/FPC in analyses of CRSO alternatives be reflected in the EIS rather than providing an interpretation or translation of those results, which could be misleading to the public. In the analytical results provided to the action agencies of CSS analyses, it is more accurate to say that MO1 and the NAA alternatives were similar across all of the cohort model analyses for steelhead. Based upon CSS/FPC analyses, it is not accurate to represent MO1 as even a "slight improvement" over the No Action Alternative.

Lines 44-45, page 3-2

It is unclear how MO1 could result in a decrease in the proportion of juveniles transported, when compared to the NAA, given that transportation begins over two weeks earlier under MO1 (April

15) than under the NAA (May 1). Increasing spill for the 115%/120% spill treatment for only half the season is unlikely to negate the impact of starting transportation a full two weeks earlier. Furthermore, foot note 1 in this statement indicates that transportation proportion in CSS modeling for SR steelhead was not provided. Proportion transported is an input to the CSS LCM only. The CSS cohort models to not require such an input. Therefore, the CSS only estimated proportion transported for yearling Chinook in order to conduct modeling with the CSS LCM. These estimates were provided in CRSO-33. This footnote should be reworded to clarify that the CSS only estimated proportion transported as an input to the LCM model and did not estimate proportion transported for steelhead because the CSS does not have a CSS LCM for steelhead.

Table 1, page 3-2
While the table heading indicates that the 25%-75% interquartile ranges were provided, the values for these ranges were not included in the table for the estimates of juvenile survival and fish travel times. These values should be included in this table.

Line 55 – 58, page 3-2
In several submittals to the federal agencies, the FPC/CSS has reiterated the concern that review of the literature regarding surface passage and analyses of the effect of surface passage structures even up to 50% efficiency, do not have a significant effect on powerhouse passage encounters. These points were raised in multiple documents submitted to the CRSO action agencies.

Footnote 1, page 3-2
The language in this footnote should be modified to reflect the discussion in the general comments, that CSS Cohort models do not utilize "proportion transported" as a model input. CSS Transported:In-River SAR (TIR) models address transportation relative to environmental conditions.

Footnote 2, page 3-2
Again, this footnote does not accurately describe the treatment of powerhouse surface passage routes in CSS analyses. In CRSO analyses, the CSS analyses considers all of the new unspecified design surface passage structures as non-powerhouse routes of passage. In CSS analyses, surface passage weirs (RSW, TSW, ASW) are all treated as non-powerhouse routes of passage. When developing the models to estimate PITPH, the existing ice and trash sluiceways at The Dalles and Bonneville Dam first powerhouse were considered powerhouse routes while the corner collector at Bonneville was considered a non-powerhouse route.

Footnote 3, page 3-2
Again this footnote should be modified to reflect multiple submittals to the federal agencies, that CSS analyses indicate that even assuming 50% passage efficiency of new surface structures does not have a notable effect on analytical results particularly PITPH and SARs.

Line 62-66, page 3-3
The FPC analyzed the effect of early smolt transportation on wild steelhead (FPC memo July 5, 2019) and found no beneficial effect of starting transportation early.

Comment [JAD1] page 3-3
Do not confuse "proportion transported" and PITPH. All CSS analyses of steelhead are based upon the CSS cohort models (report to ISAB May 12, 2017). The CSS cohort models utilize PITPH as a model input. PITPH describes an environmental variable, spill and surface passage structure operations. PITPH describes powerhouse avoidance. "Proportion transported" is not an input or output of the CSS cohort models. PITPH is an average index of powerhouse encounters. All smolts that are transported have at least one powerhouse encounter. As stated above, proportion transported would be expected to be higher in MO1 because the smolt transportation program starts about two weeks earlier than under the NAA. All transported fish enter the powerhouse system. PITPH describes the spill/surface passage operation, not the disposition (transported or bypassed) of fish once they have entered the powerhouse. Transported smolts do not avoid the powerhouse.

Lines 78-86, page 3-3
This discussion appears to attempt to discount the results of the CSS cohort model comparisons of the NAA and MO1 alternative. The seasonal transportation effects have been addressed in separate FPC analyses of seasonal transportation (which are available to the public on the FPC website) have shown that earlier start dates of smolt transportation for steelhead and Chinook do not have a beneficial effect. Conclusions by NOAA fisheries (Williams et al 2005?) concluded that earlier start dates of transportation were not beneficial. Subsequent Biological Opinions shifted the start date of transportation to May 1. The language in lines 78 through 80 are misleading, as the 25%-75% interquartile ranges for the TIRs under both MO1 and the NAA overlap 1.0, indicating no benefit to transportation. Furthermore, the language from line 80 through line 86 is speculative and not supported by data or analyses and should be deleted. The results from CSS models should be stated as submitted, to avoid misinterpretation and confusion of results.

Line 92-95, Comment [JAD2], page 3-3
The action agencies have again confused the CSS Life cycle model and the CSS cohort models. All steelhead results are generated through the CSS cohort models.

Line 96 - 98, pages 3-3/3-4
CSS cohort models for spring Chinook and steelhead and CSS life cycle model analyses for spring/summer Chinook both concluded that the addition of surface passage structures did not result in significant improvement in powerhouse avoidance for juvenile salmon and steelhead. The CSS/FPC modeled a range of 0%-30% efficiency based upon PIT tag passage data. Higher efficiency ranges are not supported by the available data. However, the FPC/CSS responded to questions from the federal agencies on June 14, 2019 (CRSO-33). In those responses, even considering a passage efficiency of 50% did not significantly improve powerhouse avoidance.

Lines 104-108, Lines 119-120 (Table 3), and Comment [JAD3], page 3-4
Once again the federal agencies are confusing the CSS cohort model and the CSS Grande Ronde Life cycle model. All of the CSS steelhead analyses of CRSO alternatives are based upon the CSS cohort model. The CSS cohort model utilizes all CSS mark groups from all populations of steelhead originating above Lower Granite Dam and does not predict adult abundance over time. Furthermore, predictions of ocean survival and TIRs from the CSS cohort model were also provided and should be included in this section.

Line 130, page 3-5
Consideration of the detailed measures included in the MO2 alternative, reveal that the CSS cohort analyses for steelhead (and for Chinook) are overly optimistic. MO2 includes a measure that specifies that no powerhouse screens will be installed at McNary Dam, however at the same time McNary Dam is included as an additional fish transportation site. Without screen installation, the proportion of juvenile fish available for transportation at McNary will be reduced. Fish that would have been routed to the collection system will pass through the powerhouse turbines. Adding McNary as an unscreened transportation site is unlikely to be beneficial, because transportation at McNary was eliminated based upon data indicating that it was not beneficial.

Table 4, page 3-5 & 3-6
Unlike Table 1, the table heading does not include language to clarify that the 25%-75% interquartile ranges were provided for the CSS cohort model analyses. Furthermore, the values for these ranges were not included in the table for the estimates of juvenile survival and fish travel time. Values (and 25%-75% interquartile range) for juvenile survival and fish travel time should be included in this table.

Line 160-163, page 3-6
The sentence that states, "First, all smolts would be collected or transportation at the three Snake River collector projects (none bypassed back to the river)…" is confusing as written, as it seems to imply that there is no period when fish passing the Snake River transportation sites would be returned to the river. MO2 specifies that transportation from the Snake River transportation sites (and McNary) will begin on April 25th. Therefore, all fish passing these sites prior to April 25th would be bypassed to the river. Furthermore, all CSS and COMPASS analyses of future powerhouse surface passage structures have treated these passage routes as non-powerhouse routes. However, this assumption may be invalid at McNary for MO2, as fish passing through the powerhouse surface passage structure at MCN will be transported (O4-Implementation and Lines 162-163 of this Draft report. It seems illogical for a passage route that is intended to route fish into transportation to be treated as a non-powerhouse route.

Line 174, page 3-6
Again the federal agencies are confusing the CSS Cohort model results with the Grande Ronde life cycle results. All CSS steelhead analyses are based upon cohort model analyses.

Line 181, page 3-6
Again the federal agencies are confusing CSS cohort models and CSS Grande Ronde spring/ summer chinook, life cycle model results. All steelhead analyses are based upon the CSS cohort models. The CSS cohort analyses present predicted SARs for CRSO alternatives in terms of Lower Granite to Bonneville return rates.

Footnote 8, page 3-6
See our previous comments for Footnote 2 (page 3-2) regarding the accuracy of the description of the CSS analyses including surface passage structures.

Lines 183-190, Table 5, and Comments [JAD4 and JAD5], page 3-6 and 3-7
Once again the federal agencies are confusing the CSS cohort model and the CSS Grande Ronde Life cycle model. All of the CSS steelhead analyses of CRSO alternatives are based upon the CSS cohort model. The CSS cohort model utilizes all CSS mark groups from all populations of steelhead originating above Lower Granite Dam and does not predict adult abundance over time. Furthermore, predictions of ocean survival and TIRs from the CSS cohort model were also provided and should be included in this section and table.

Line 197-198, page 3-7
Once again the federal agencies have confused the CSS cohort model results with the CSS Grande Ronde spring/summer Chinook life cycle model. All steelhead results are based on the CSS cohort models, which do not predict adult abundance over time.

Table 7, page 3-8
The table heading does not include language to clarify that the 25%-75% interquartile ranges were provided for the CSS cohort model analyses. Furthermore, the values for these ranges were not included in the table for the estimates of juvenile survival and fish travel time. Values (and 25%-75% interquartile range) for juvenile survival and fish travel time should be included in this table.

Line 246, Lines 254-261, Table 8, Table 9, and Comments [JAD6 and JAD7], pages 3-9 and 3-10
Once again the federal agencies have confused the CSS cohort model results with the CSS Grande Ronde spring/summer Chinook life cycle model. All steelhead results are based on the CSS cohort models. The CSS cohort model utilizes all CSS mark groups from all populations of steelhead originating above Lower Granite Dam and does not predict adult abundance over time. Furthermore, predictions of ocean survival and TIRs from the CSS cohort model were also provided and should be included in this section and table.

Line 279, 3.4.8, page 3-10
Careful review of the data sets provided for MO4, indicates that the CSS modelling results are expected to be overly optimistic for MO4, in terms of the PITPH index for powerhouse avoidance. Specifically, the spill at Bonneville Dam in the MO4 data sets is higher than is actually possible. The federal agencies have stated that spill at Bonneville Dam is capped at 150 Kcfs because of tailrace structural limitations. This should be clearly defined in the description of MO4. This was raised in response to questions from the federal agencies, submitted on June 14, 2019 (CRSO-33).

Table 10, page 3-11
The table heading does not include language to clarify that the 25%-75% interquartile ranges were provided for the CSS cohort model analyses. Furthermore, the values for these ranges were not included in the table for the estimates of juvenile survival and fish travel time. Values (and 25%-75% interquartile range) for juvenile survival and fish travel time should be included in this table.

Line 315-320, Lines 328-335, Table 11, Table 12, and Comments [JAD8 and JAD9] pages 3-11 and 3-12
Once again the federal agencies have confused the CSS cohort model results with the CSS Grande Ronde spring summer chinook life cycle model. All steelhead results are based on the CSS cohort models. The CSS cohort model utilizes all CSS mark groups from all populations of steelhead originating above Lower Granite Dam and does not predict adult abundance over time. Furthermore, predictions of ocean survival and TIRs from the CSS cohort model were also provided and should be included in this section and table. Finally, delayed and latent mortality is included in the CSS analyses of CRSO alternatives by reporting results in terms of smolt-to-adult return rates.

Thank you for the opportunity to review the draft.

From: Doumbia,Julie A (BPA) - EC-5
Sent: Wednesday, July 03, 2019 8:45 AM
To: 'Daniel Widener - NOAA Affiliate'; 'James Faulkner - NOAA Federal'; 'Michele Dehart'; 'Rich Zabel - NOAA Federal'
Cc: Chuck Chamberlain (NWW); Sue Camp (scamp@usbr.gov); Petersen,Christine H (BPA) - EWP-4; Hauser,Tracy L (BPA) - EWL-4
Subject: REVIEW REQUESTED BY JULY 12: SR Steelhead modeling

Hello Fish Modelers,

(b) (5)

[redacted]

(b) (5)

[redacted]

Thank you all again,

Julie

From: Doumbia,Julie A (BPA) - EC-5

Sent: Tue Apr 30 13:31:26 2019

To: Michele Dehart; Hauser,Tracy L (BPA) - EWL-4

Cc: Chuck Chamberlain (NWW); Sue Camp (scamp@usbr.gov); Thomas C. Christian; Annie Kilburg

Subject: RE: CSS modeling of CRSO EIS alternatives

Importance: Normal

Hello Michele,

Of course we will make these available, but should we add you to the agenda for May 29th?

Thomas: please add this memo to the upcoming MO1/MO4 modeling notes and presentations distribution for the fish tech team, we'll need to note that although this wasn't a presentation at that meeting, their results are now available. If we hear back from Michele about May 29th, would be great to let the fish tech team also know if they will have that upcoming opportunity for Q&A or not.

Thanks again,

Julie

From: Michele Dehart [mailto:mdehart@fpc.org]
Sent: Tuesday, April 30, 2019 11:12 AM
To: Doumbia,Julie A (BPA) - EC-5; Hauser,Tracy L (BPA) - EWL-4
Cc: Chuck Chamberlain (NWW); Sue Camp (scamp@usbr.gov); Thomas C. Christian; Annie Kilburg
Subject: [EXTERNAL] RE: CSS modeling of CRSO EIS alternatives

Julie:

Please send the CSS modeling of CRSO EIS alternatives memo to the members of the Fish Technical Team. I do not have a list of all of the members nor their email addresses.

Michele DeHart, Manager

The Fish Passage Center

From: Doumbia,Julie A (BPA) - EC-5 [mailto:jadoumbia@bpa.gov]
Sent: Monday, April 29, 2019 5:21 PM
To: Michele Dehart; Hauser,Tracy L (BPA) - EWL-4
Cc: Chuck Chamberlain (NWW); Sue Camp (scamp@usbr.gov); Thomas C. Christian; Annie Kilburg
Subject: RE: CSS modeling of CRSO EIS alternatives

Hello Michele,

Thank you for sending your CSS analysis, we will review and begin integrating your results into the draft EIS documentation and get back to you with any critical questions.

Also, are you or your modeling team available to present your CSS results on the morning of May 29th, along with the other CRSO fish modeling groups? The debrief on May 29th is specific to MO2/MO3, but it's fine if you're available and can present your results on all four alternatives relative to the No Action Alternative since this will be the first time you would have your results debrief. This is not required, but it is a good opportunity to present your results to the broader CRSO fish team and have the opportunity for Q&A directly from them.

Thank you again,

Julie

From: Michele Dehart [mailto:mdehart@fpc.org]
Sent: Monday, April 29, 2019 3:36 PM
To: 'ED.Bowles@state.or.us'; Tucker Jones (tucker.a.jones@state.or.us); Garrity, Michael D (DFW) (Michael.Garrity@dfw.wa.gov); 'Bill Tweit (tweitwmt@dfw.wa.gov)'; 'Rob Lothrop (lotr@critfc.org)'; lance Hebdon; Doumbia,Julie A (BPA) - EC-5; Chuck Chamberlain (Charles.B.Chamberlain@usace.army.mil); Steve_Haeseker@fws.gov; Rawding, Daniel J (DFW) (Daniel.Rawding@dfw.wa.gov); Adam Storch (adam.j.storch@state.or.us); Robert Lessard (LESR@critfc.org); Hauser,Tracy L (BPA) - EWL-4; Tom Iverson (t.k.iverson@comcast.net); Art Martin; Jay Hesse (jayh@nezperce.org); Kiefer,Russell (russ.kiefer@idfg.idaho.gov); 'Tom Lorz (lort@critfc.org)'; tim.copeland@idfg.idaho.gov

Cc: Randy Fisher (RFisher@psmfc.org); Jerry McCann; Brandon Chockley; Bobby Hsu; Gabriel Scheer; Erin Cooper
Subject: [EXTERNAL] CSS modeling of CRSO EIS alternatives

Julie and Chuck and Tracy:

Attached are the results of CSS modelling analyses of all of the CRSO EIS operations alternatives compared to the No Action Alternative.

The CSS Oversight Committee and the Fish Passage Center, agreed to utilize CSS methodologies to analyze the CRSO EIS operation alternatives and provide results to the CRSO Fish Technical Team by April 29, 2019.

These analyses are based upon the 80 year water record data sets provided to the Fish Passage Center by BPA and the USACOE.

Michele DeHart, Manager

The Fish Passage Center

From: Doumbia,Julie A (BPA) - EC-5

Sent: Tue Apr 16 14:08:26 2019

To: Daniel Widener - NOAA Affiliate; James J Anderson (jjand@uw.edu); James Faulkner - NOAA Federal; Michele Dehart; nickbeer@uw.edu; Rich Zabel - NOAA Federal

Cc: Chuck Chamberlain (NWW); Sue Camp (scamp@usbr.gov); Petersen,Christine H (BPA) - EWP-4; Hauser,Tracy L (BPA) - EWL-4

Subject: 4/16 CRSO Fish Modelers Update

Importance: Normal

Hello CRSO Fish Modelers,

We only have a few reminders below, thank you all very much for the work you're doing!

[redacted]

(b) (5)

[redacted]

A big thank you to the fish modeling groups who have been delivering their modeling results and/or IEPR documents on time, as this (1) ensures the rest of the fish team and other effects analysis teams have time to review and ask questions to better understand your modeling results, as well as (2) keeps us on track for completion of the overall draft EIS on schedule.

And as always, please let Sue, Chuck, and me know as soon as possible if you encounter any delays affecting delivery of your results, or if you have any questions/data needs.

Thank you all again,

Julie

Julie Doumbia

Environmental Protection Specialist

Bonneville Power Administration
bpa.gov | P 503-230-7641 | C [redacted]

From: Sweet,Jason C (BPA) - PGB-5

Sent: Tue Dec 31 09:50:04 2019

To: 'Daniel Widener - NOAA Affiliate'; Chamberlain, Charles B CIV USARMY CENWW (USA)

Cc: Michele Dehart; Rich Zabel

Subject: RE: [EXTERNAL] Re: Bulleted Preferred Alternative

Importance: Normal

Hi Dan,

[redacted] (b) (5)

Thanks.

Jason

From: Daniel Widener - NOAA Affiliate [mailto:daniel.widener@noaa.gov]
Sent: Tuesday, December 31, 2019 8:58 AM
To: Chamberlain, Charles B CIV USARMY CENWW (USA)
Cc: Michele Dehart; Rich Zabel; Sweet,Jason C (BPA) - PGB-5
Subject: [EXTERNAL] Re: Bulleted Preferred Alternative

Hello Chuck,

(b) (5) [redacted]

Dan

On Mon, Dec 30, 2019 at 12:13 PM Daniel Widener - NOAA Affiliate <daniel.widener@noaa.gov> wrote:

Hello Chuck,

(b) (5) [redacted]

Dan Widener

On Mon, Dec 30, 2019 at 10:42 AM Chamberlain, Charles B CIV USARMY CENWW (USA) <Charles.B.Chamberlain@usace.army.mil> wrote:

Fish Modeling Team,

(b) (5) [redacted]

Respectfully,

Charles Chamberlain
Biologist
US Army Corps of Engineers
Walla Walla District

201 North 3rd Avenue
Walla Walla, WA 99362
509-527-7298

--

Daniel Widener

Contractor with Ocean Associates, Inc.

Fish Ecology Division

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Daniel Widener

Contractor with Ocean Associates, Inc.

Fish Ecology Division

From: Doumbia,Julie A (BPA) - EC-5

Sent: Fri Jun 14 08:55:33 2019

To: Michele Dehart

Subject: RE: Flow years follow-up

Importance: Normal

Perfect, thanks very much Michele, we should be good then on the MO2 analyses and steelhead updates – thank you!

Julie

From: Michele Dehart [mailto:mdehart@fpc.org]
Sent: Friday, June 14, 2019 8:54 AM
To: Doumbia,Julie A (BPA) - EC-5
Subject: [EXTERNAL] RE: Flow years follow-up

Julie:

The answers to BPA questions which will probably be out today:

1. Include Dr. Haesekers' correction to the May 12, 2017 report to the ISAB. The May 12, 2017 report has been corrected, has been sent to the Northwest Power and Conservation Council, Independent Scientific Advisory

Board, and has been posted on the FPC website.

2. The answers to the BPA questions include analyses of the new MO2 data sets, that were provided to the FPC by the action agencies.

Michele

From: Doumbia,Julie A (BPA) - EC-5 [mailto:jadoumbia@bpa.gov]
Sent: Friday, June 14, 2019 8:46 AM
To: Michele Dehart
Cc: Hauser,Tracy L (BPA) - EWL-4
Subject: RE: Flow years follow-up

Hello Michele,

Thank you for the update on responses to questions, we look forward to incorporating these into the draft EIS as appropriate.

Regarding additional analyses, a couple of clarifications would be helpful:

1. Steelhead ocean coefficient correction – Mr. Haeseker mentioned that one of the steelhead coefficients (ocean coefficient) was incorrect and it would have a noticeable effect on results. He said that errata would be sent to ISAB and to us for CRSO since this would affect the steelhead adult returns (and SARs we assume). Has the

plan changed, or how are we to know how much this error affected the CSS CRSO results?

2. MO2 – there was a new MO2 dataset provided to all the fish modeling groups on 5/23 from Ross Wickam after a modeling error in MO2 was detected that affected the spring outmigration flows, are you indicating that a) there was no change in your MO2 CSS results between old and new MO2 H&H datasets, or b) you will not evaluate the potential differences in CSS results between the previous MO2 and the new MO2 H&H datasets?

Thank you for clarifying,

Julie

From: Michele Dehart [mailto:mdehart@fpc.org]
Sent: Thursday, June 13, 2019 8:58 AM
To: Doumbia,Julie A (BPA) - EC-5
Subject: [EXTERNAL] RE: Flow years follow-up

Julie:

You should have the responses to all of the questions posed by BPA including the questions, discussed on the May 29, 2019 presentations, by the end of this week. We do not plan on providing additional analyses to the federal agencies unless the federal agencies ask for additional analyses. However, in our established role as technical support and advisors to the state, federal and tribal fishery managers, we will continue to respond to requests for technical support, and will continue to work on our CRSO analyses, for eventual inclusion into the CSS Annual Report.

Michele

From: Doumbia,Julie A (BPA) - EC-5 [mailto:jadoumbia@bpa.gov]
Sent: Wednesday, June 12, 2019 9:01 AM
To: Michele Dehart; Hauser,Tracy L (BPA) - EWL-4
Cc: tim.copeland@idfg.idaho.gov; Adam Storch (adam.j.storch@state.or.us); Steve_Haeseker@fws.gov; Robert Lessard (LESR@critfc.org); Rawding, Daniel J (DFW) (Daniel.Rawding@dfw.wa.gov); Jerry McCann; Brandon Chockley; Erin Cooper; Gabriel Scheer; Bobby Hsu
Subject: RE: Flow years follow-up

Hi Michele,

Thanks for clarifying – we heard you may be working on this and I wanted to clarify what that entailed, if that was the case, so thank you for clarifying that this is not the case.

As far as updates between now and June 21st, we understand that the question responses, updates to steelhead SARs/abundance for NAA, MO1-MO4 (steelhead ocean survival coefficient issue), and updated MO2 post-re-run are the only efforts in progress – is this correct?

Thank you again,

Julie

From: Michele Dehart [mailto:mdehart@fpc.org]
Sent: Tuesday, June 11, 2019 3:00 PM
To: Doumbia,Julie A (BPA) - EC-5
Cc: tim.copeland@idfg.idaho.gov; Adam Storch (adam.j.storch@state.or.us); Steve_Haeseker@fws.gov; Robert Lessard (LESR@critfc.org); Rawding, Daniel J (DFW) (Daniel.Rawding@dfw.wa.gov); Jerry McCann; Brandon Chockley; Erin Cooper; Gabriel Scheer; Bobby Hsu
Subject: [EXTERNAL] RE: Flow years follow-up

Hello Julie:

In response to your June 10, 2019 email, the CSS Oversight Committee and the Fish Passage Center are not conducting any additional analysis of CRSO alternatives. These CSS analyses are well vetted through ISAB and public annual reviews. We are confident in the methods, analytical approaches and results of analyses of the CRSO EIS operational alternatives which we have provided to the federal action agencies.

Michele DeHart, Manager

The Fish Passage Center

From: Doumbia,Julie A (BPA) - EC-5 [mailto:jadoumbia@bpa.gov]
Sent: Monday, June 10, 2019 1:35 PM

To: Michele Dehart
Cc: Hauser,Tracy L (BPA) - EWL-4
Subject: Flow years follow-up

Hello Michele,

I have a question that I hope is relatively straightforward – but may not be – at the last fish modeling debrief, Bob mentioned that there was an approach that Jim Anderson proposed that would be better for the CSS modeling than categorizing years by dry-avg-wet for results purposes based on the P20 and P80 April-August observed flows, that we had proposed.

I had a chance to talk to Jim last week about their own modeling for CRSO and asked him about what he had proposed for this, and it sounded more like isolating outlier years and re-calculating co-efficients than what I thought Bob was proposing in the meeting – I thought he was suggesting more along the lines of sensitivity analysis for individual years.

It was a week and a half ago and I apologize for the delay, but I'd just like to clarify if, and if so, what, any additional analysis related to dry-avg-wet years for CSS modeling is underway?

Thanks very much and again apologies for not clarifying this earlier – we haven't sent the 80 years since it sounded like Bob thought there was a better approach to get at the differential effects question based on flow or water year type.

Julie

Julie Doumbia

Environmental Protection Specialist

Bonneville Power Administration
bpa.gov | P 503-230-7641 | C (b) (6) [redacted]

From: Michele Dehart

Sent: Wed May 15 08:33:08 2019

To: Doumbia,Julie A (BPA) - EC-5

Cc: Art Martin; Jay Hesse (jayh@nezperce.org); Tom Iverson (t.k.iverson@comcast.net); Adam Storch (adam.j.storch@state.or.us); Garrity, Michael D (DFW) (Michael.Garrity@dfw.wa.gov); Tucker Jones (tucker.a.jones@state.or.us); lance Hebdon; 'Rob Lothrop (lotr@critfc.org)'; Steve_Haeseker@fws.gov; Robert Lessard (LESR@critfc.org)

Subject: [EXTERNAL] RE: H&H data sets for CRSO analyses (UNCLASSIFIED)

Importance: Normal

Hello Julie:
Our CSS modelling of the final CRSO EIS alternatives has been delivered to you on April 29, 2019 as promised. We are studying reservoir operations in the data sets to understand the proposed operations changes at upstream reservoirs, and to further our understanding of the details of each of the CRSO alternatives.

Michele

-----Original Message-----
From: Doumbia,Julie A (BPA) - EC-5 [mailto:jadoumbia@bpa.gov]
Sent: Wednesday, May 15, 2019 7:55 AM
To: Michele Dehart; Buccola, Norman L (Norm) CIV USARMY CENWP (USA)
Cc: Wickham, Ross S CIV (US)
Subject: RE: H&H data sets for CRSO analyses (UNCLASSIFIED)

Hello Michele,

Please advise if you are still modeling CSS results for the draft EIS, since we were under the impression that all the CSS modeling for the draft EIS was complete (i.e. your memo CRSO-24).

Libby is far upstream of the passage projects and last headwater projects, so it is unclear why Libby flows specifically would be needed at this late stage after CSS modeling has been completed.

Thank you,

Julie

-----Original Message-----
From: Michele Dehart [mailto:mdehart@fpc.org]
Sent: Tuesday, May 14, 2019 3:18 PM
To: Buccola, Norman L (Norm) CIV USARMY CENWP (USA)
Cc: Doumbia,Julie A (BPA) - EC-5; Wickham, Ross S CIV (US)
Subject: [EXTERNAL] RE: H&H data sets for CRSO analyses (UNCLASSIFIED)

(b) (5)
[redacted]

Thanks for your help with this question.
Michele

-----Original Message-----
From: Buccola, Norman L (Norm) CIV USARMY CENWP (USA) [mailto:Norman.L.Buccola@usace.army.mil]
Sent: Tuesday, May 14, 2019 2:51 PM
To: Michele Dehart
Cc: Julie Doumbia; Wickham, Ross S CIV (US)
Subject: RE: H&H data sets for CRSO analyses (UNCLASSIFIED)

CLASSIFICATION: UNCLASSIFIED

Michele,

(b) (5)
[redacted]

Thanks

Norman Buccola
Water Quality Engineer
U. S. Army Corps of Engineers Portland District
503-808-4837

Norman.Buccola@usace.army.mil

-----Original Message-----
From: Michele Dehart [mailto:mdehart@fpc.org]
Sent: Monday, May 13, 2019 2:30 PM
To: Buccola, Norman L (Norm) CIV USARMY CENWP (USA) <Norman.L.Buccola@usace.army.mil>
Cc: Julie Doumbia <jadoumbia@bpa.gov>
Subject: [Non-DoD Source] H&H data sets for CRSO analyses

Hello Norman:

(b) (5) [redacted]

Thanks

Michele DeHart, Manager

The Fish Passage Center

CLASSIFICATION: UNCLASSIFIED

From: Michele Dehart

Sent: Thu May 23 15:54:52 2019

To: Buccola, Norman L (Norm) CIV USARMY CENWP (USA); Daniel Widener - NOAA Affiliate; Chamberlain, Charles B CIV USARMY CENWW (USA); Pinney, Chris A CIV USARMY CENWW (US); scamp@usbr.gov; Doumbia,Julie A (BPA) - EC-5; Rich Zabel - NOAA Federal; James J Anderson (jjand@uw.edu); Petersen,Christine H (BPA) - EWP-4; James Faulkner - NOAA Federal; nickbeer@uw.edu; Petersen,Christine H (BPA) - EWP-4

Cc: Whorley, Kasi A CIV USARMY CENWD (USA); Mickelson, Kristian E CIV USARMY CENWS (USA); Tackley, Kathryn L CIV USARMY CENWP (USA); Hauser,Tracy L (BPA) - EWL-4; Turner, Daniel F CIV USARMY CENWD (USA); Novotny, Eric V CIV USARMY CEMVP (US); Marxen, Sara C CIV USARMY CENWS (US)

Subject: [EXTERNAL] RE: Alternative results to Fish Team for MO2 v2 (UNCLASSIFIED)

Importance: Normal

Norman:
(b) (5) [redacted]
Thank you Norman
Michele

-----Original Message-----
From: Buccola, Norman L (Norm) CIV USARMY CENWP (USA) [mailto:Norman.L.Buccola@usace.army.mil]
Sent: Thursday, May 23, 2019 2:33 PM
To: Daniel Widener - NOAA Affiliate; Chamberlain, Charles B CIV USARMY CENWW (USA); Pinney, Chris A CIV USARMY CENWW (US); scamp@usbr.gov; Julie Doumbia; Rich Zabel - NOAA Federal; James J Anderson (jjand@uw.edu); Petersen,Christine H (BPA) - EWP-4; James Faulkner - NOAA Federal; nickbeer@uw.edu; chpetersen@bpa.gov
Cc: Whorley, Kasi A CIV USARMY CENWD (USA); Mickelson, Kristian E CIV USARMY CENWS (USA); Tackley, Kathryn L CIV USARMY CENWP (USA); Michele Dehart; Tracy Hauser (tlhauser@bpa.gov); Turner, Daniel F CIV USARMY CENWD (USA); Novotny, Eric V CIV USARMY CEMVP (US); Marxen, Sara C CIV USARMY CENWS (US)

Subject: Alternative results to Fish Team for MO2 v2 (UNCLASSIFIED)

CLASSIFICATION: UNCLASSIFIED

Fish Team,

[redacted]

(b) (5)

[redacted]

Thanks

Norman Buccola
Hydraulic Engineer
U. S. Army Corps of Engineers Portland District
503-808-4837
Norman.Buccola@usace.army.mil

CLASSIFICATION: UNCLASSIFIED

From: Michele Dehart

Sent: Thu Feb 13 16:39:59 2020

To: Hauser,Tracy L (BPA) - EWL-4

Subject: [EXTERNAL] RE: EIS CSS model presentation

Importance: Normal

Tracy:

As I say no one contacted me about this, so I am a bit surprised. The pressure is really on for us to get that chapter 2 done.

Michele

From: Hauser,Tracy L (BPA) - EWL-4 [mailto:tlhauser@bpa.gov]
Sent: Thursday, February 13, 2020 4:37 PM
To: Michele Dehart <mdehart@fpc.org>
Cc: 'Bob Lessard' <lessard@critfc.org>; Steve_Haeseker@fws.gov; Adam J Storch <Adam.J.Storch@state.or.us>; 'Dan Rawding (daniel.rawding@dfw.wa.gov)' <daniel.rawding@dfw.wa.gov>; 'Tim Copeland (tim.copeland@idfg.idaho.gov)' <tim.copeland@idfg.idaho.gov>; Tucker Jones <Tucker.A.Jones@state.or.us>; Rob Lothrop (lotr@critfc.org) <lotr@critfc.org>; Jule,Kristen R (BPA) - EWP-4 <krjule@bpa.gov>
Subject: RE: EIS CSS model presentation

Michele the Corps has contracted with Battelle to lead the review. I have shared this with Kristen Jule so she can follow up with the right folks on your concerns below. ~ Tracy

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Tracy L. Hauser, F&W Project Mgr cid:image001.png@01D3C808.E543B670

From: Michele Dehart <mdehart@fpc.org>
Sent: Thursday, February 13, 2020 4:02 PM
To: Hauser,Tracy L (BPA) - EWL-4 <tlhauser@bpa.gov>
Cc: 'Bob Lessard' <lessard@critfc.org>; Steve_Haeseker@fws.gov; Adam J Storch <Adam.J.Storch@state.or.us>; 'Dan Rawding (daniel.rawding@dfw.wa.gov)' <daniel.rawding@dfw.wa.gov>; 'Tim Copeland (tim.copeland@idfg.idaho.gov)' <tim.copeland@idfg.idaho.gov>; Tucker Jones <Tucker.A.Jones@state.or.us>; Rob Lothrop (lotr@critfc.org) <lotr@critfc.org>
Subject: [EXTERNAL] RE: EIS CSS model presentation

Tracy:

I have not been contacted by the Corps. On August 15, 2019 we provided all of the models code, and coefficients and documentation for the cohort model to Chuck Chamberlain at the COE as they requested. We have provided all of the documents explaining the models. They have had a significant amount of time and they have everything they need, including years of CSS Annual Reports and ISAB reviews, to conduct a review. If after reviewing the considerable amount of documentation provided to them regarding the COE models, the reviewers have specific questions, I strongly suggest they provide those questions to us in writing and we will respond in writing. I suggest that it would be most efficient to coordinate the COE model peer review with the already planned ISAB and public review of these analyses.

The March 3 through 10 time frame is not workable for the CSS Oversight Committee. From now through March 9, the top work priority focus for the CSS Oversight Committee is completion of Chapter 2, of the CSS Annual

Report. You recall that this chapter is due to be released on or around February 28, 2020.   The topic of Chapter 2 is the CSS model analyses, including documentation of methods and results. of the CRSO alternatives including documentation of methods and results . This Chapter will be reviewed by the Independent Scientific Advisory Board of the Northwest Power and Conservation Council as well as the public at large. We will respond to all written comments. I suggest that it would be most efficient to complete chapter 2, then the Corps peer reviewers can review that chapter and provide written comments and questions in writing.

Please let me know who comprises the COE peer review panel.

Michele Dehart, Manager

The Fish Passage Center

From: Hauser,Tracy L (BPA) - EWL-4 [mailto:tlhauser@bpa.gov]
Sent: Thursday, February 13, 2020 3:30 PM
To: Michele Dehart <mdehart@fpc.org>
Subject: EIS CSS model presentation

Hi Michele

I wanted to reach out to you and let you know that the Corps is doing an independent peer review of the CRO/EIS models and you will be contacted to present on March 3, 2020 between 12-3 a brief overview (10-15 minutes) of your CSS model. If you have existing presentation material, you can use that and you can do it over phone and

WebEx so no need to travel unless you want to do it in person. Then if needed, they may have additional follow up questions sometime in April/May that you can respond via phone or email. ~ Tracy

If you have questions you can contact the following staff:

Leah Hauenstein, Leah.J.HAUENSTEIN@usace.army.mil

Desk: 206-316-3169

Rachel Mesko Rachel.C.Mesko@usace.army.mil

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Tracy L. Hauser, F&W Project Mgr cid:image001.png@01D3C808.E543B670

Bonneville Power Administration

Fish & Wildlife, Oregon Implementation

P.O. Box 3621 - EWL-4

Portland, OR 97208-3621

503-230-4296 '

[redacted] *cell*

503-230-4564 fax

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From: Michele Dehart

Sent: Fri Mar 13 07:23:32 2020

To: Sweet,Jason C (BPA) - PGB-5; Chamberlain, Charles B CIV USARMY CENWW (USA)

Subject: [EXTERNAL] RE: CRSO EIS Raw Data

Importance: Normal

Jason:
For additional clarity are you asking for probabilities of outcomes from the simulation outputs for each year in the 80 year water record?
Michele

-----Original Message-----
From: Sweet,Jason C (BPA) - PGB-5 [mailto:jcsweet@bpa.gov]
Sent: Thursday, March 12, 2020 2:40 PM
To: Chamberlain, Charles B CIV USARMY CENWW (USA) <Charles.B.Chamberlain@usace.army.mil>; Michele Dehart <mdehart@fpc.org>
Subject: RE: CRSO EIS Raw Data

Hi Michele,

To add to Chuck's response, we are looking for the single result (after running the 10,000 random simulations) for each metric that lines up with each of the 80 different water conditions. We appreciate that you have provided the mean result as well as the inter-quartile ranges in the memo, but we are requesting the full set of 80 predicted outcomes for the NAA, MO1, MO2, MO3, MO4 and the PA. As an example of what we are asking for, please see Table 4-1 in Appendix E. We will plan to add the raw CSS data to appendix E as well. Thanks.

Jason

-----Original Message-----
From: Chamberlain, Charles B CIV USARMY CENWW (USA) <Charles.B.Chamberlain@usace.army.mil>
Sent: Thursday, March 12, 2020 2:09 PM
To: Michele Dehart <mdehart@fpc.org>
Cc: Sweet,Jason C (BPA) - PGB-5 <jcsweet@bpa.gov>
Subject: [EXTERNAL] RE: CRSO EIS Raw Data

Michele,

Thanks for responding. What we were hoping to get is the entire 80 year data set so that we can view a specific water year type and see projected travel times, PITPH and survivals etc. under differing water years.

Charles Chamberlain
Biologist
US Army Corps of Engineers
Walla Walla District
201 North 3rd Avenue
Walla Walla, WA 99362
509-527-7298

-----Original Message-----
From: Michele Dehart [mailto:mdehart@fpc.org]
Sent: Thursday, March 12, 2020 1:57 PM
To: Chamberlain, Charles B CIV USARMY CENWW (USA) <Charles.B.Chamberlain@usace.army.mil>
Cc: Jerry McCann <jmccann@fpc.org>; Brandon Chockley <bchockley@fpc.org>; Haeseker, Steve <Steve_haeseker@fws.gov>; 'Bob Lessard' <lessard@critfc.org>
Subject: [Non-DoD Source] RE: CRSO EIS Raw Data

Chuck:
I do not understand what you are asking for exactly. Could you be more specific. The ranges are shown in the tables we provided to you in the January 24, 2020 memorandum analyses of the CRSO-EIS alternatives and the PA. The water travel times and PITPH and the proportion transported are in that memorandum also. Each of the tables in the January 24, 2020 memorandum show the average for each metric and the ranges in parentheses. Table 6, juvenile survival for chinook and steelhead, Table 7, juvenile fish travel time for chinook and steelhead, Table 8, ocean survival rates for chinook and steelhead, averages and ranges in parentheses. Table 9, SARs for chinook and steelhead averages and ranges in parentheses. Table 10, Transport: In-river ratios, average with ranges in parentheses. We have already provided these to you on January 24. 2020.

Michele

Thanks
Michele

-----Original Message-----
From: Chamberlain, Charles B CIV USARMY CENWW (USA) [mailto:Charles.B.Chamberlain@usace.army.mil]
Sent: Thursday, March 12, 2020 11:50 AM
To: Michele Dehart <mdehart@fpc.org>

Cc: Sweet,Jason C (BPA) - PGB-5 <jcsweet@bpa.gov>
Subject: CRSO EIS Raw Data

Michele,

We have been getting comments that we have not adequately shown the range of modeled effects for the fish effects models used in the DEIS. Consequently, we would like to get a copy of the raw data for the 80 year water record from the CSS team. We would like these data for each of the metrics you provided. Please let me know if you have any questions or need additional information.

Charles Chamberlain
Biologist
US Army Corps of Engineers
Walla Walla District
201 North 3rd Avenue
Walla Walla, WA 99362
509-527-7298

From: Tom Iverson

Sent: Fri Jun 14 13:42:12 2019

To: 'Doumbia,Julie A (BPA) - EC-5'; 'Michele Dehart'; 'Tucker Jones'; 'Art Martin'; 'Adam Storch'; Steve_Haeseker@fws.gov; 'Chuck Chamberlain'; 'Robert Lessard'; tim.copeland@idfg.idaho.gov; 'Rawding, Daniel J (DFW)'; 'Hauser,Tracy L (BPA) - EWL-4'

Bcc: jadoumbia@bpa.gov

Subject: [EXTERNAL] RE: tom iverson memo

Importance: Normal

Hi Julie,

I am operating under the assumption that we can request clarification and explanation from the modelers about their efforts and outputs. No additional analyses were completed to respond to this request?

Tom Iverson

971-221-8561

From: Doumbia,Julie A (BPA) - EC-5 <jadoumbia@bpa.gov>
Sent: Friday, June 14, 2019 1:37 PM
To: Michele Dehart <mdehart@fpc.org>; Tom Iverson (t.k.iverson@comcast.net) <t.k.iverson@comcast.net>; Tucker Jones (tucker.a.jones@state.or.us) <tucker.a.jones@state.or.us>; Art Martin <art.c.martin@state.or.us>; Adam Storch (adam.j.storch@state.or.us) <adam.j.storch@state.or.us>; Steve_Haeseker@fws.gov; Chuck Chamberlain (Charles.B.Chamberlain@usace.army.mil) <Charles.B.Chamberlain@usace.army.mil>; Robert

Lessard (LESR@critfc.org) <LESR@critfc.org>; tim.copeland@idfg.idaho.gov; Rawding, Daniel J (DFW) (Daniel.Rawding@dfw.wa.gov) <Daniel.Rawding@dfw.wa.gov>; Hauser,Tracy L (BPA) - EWL-4 <tlhauser@bpa.gov>
Subject: RE: tom iverson memo

Hello Michele,

I'll check on the status of our co-lead agencies' policy of not funding cooperating agency participation in the EIS, since my understanding was that there was a strict policy about not funding CA participation in this EIS, since it seems if they are requesting analyses from FPC using BPA project funding instead of using their own staff time and expertise.

Also, could you send us your CRSO memos 1-31? The last memo we received was CRSO-24, this one is numbered CRSO-32…. are we missing something?

Thanks again,

Julie

From: Michele Dehart [mailto:mdehart@fpc.org]
Sent: Friday, June 14, 2019 12:51 PM

To: Tom Iverson (t.k.iverson@comcast.net); Tucker Jones (tucker.a.jones@state.or.us); Art Martin; Adam Storch (adam.j.storch@state.or.us); Steve_Haeseker@fws.gov; Chuck Chamberlain (Charles.B.Chamberlain@usace.army.mil); Doumbia,Julie A (BPA) - EC-5; Robert Lessard (LESR@critfc.org); tim.copeland@idfg.idaho.gov; Rawding, Daniel J (DFW) (Daniel.Rawding@dfw.wa.gov)
Subject: [EXTERNAL] FW: tom iverson memo

Tom:

Attached is our response to questions regarding the CSS models analyses. I am sending a copy to Julie Doumbia, BPA, as an appendix to the response to the modelling questions we received and to Charles Chamberlain at the COE so he can include this in the packet of materials that he provides to the USACOE Statistical Peer Review Panel for the CRSO analyses.

As with other CRSO materials, this will not be posted on the FPC website. Since the Yakama Nation is a cooperating agency I can send you a copy of the response to BPA questions.

Please call if you have questions

Michele

From: Michele Dehart

Sent: Thu Oct 24 11:51:10 2019

To: Hauser,Tracy L - KEWL-4 (tlhauser@bpa.gov)

Subject: [EXTERNAL] FW: Preferred Alternative

Importance: Normal

Just an FYI. It looks like we will be working on that CRSO work element into January and perhaps February depending on when the data sets are available.
Michele

-----Original Message-----
From: Chamberlain, Charles B CIV USARMY CENWW (USA) [mailto:Charles.B.Chamberlain@usace.army.mil]
Sent: Thursday, October 24, 2019 11:02 AM
To: Daniel Widener - NOAA Affiliate; Michele Dehart
Cc: Granet, Jesse J CIV USARMY CENWD (USA); Hauenstein, Leah J CIV (USA)
Subject: Preferred Alternative

Dan and Michele,

I just received word that the Preferred Alternative is still in development and you will likely get that information later in November and will receive data in December. We will incorporate it into the draft EIS just before it goes out for public review in February. Thanks for your patience and your help.

Charles Chamberlain
Biologist
US Army Corps of Engineers
Walla Walla District
201 North 3rd Avenue
Walla Walla, WA 99362
509-527-7298

From: Donahue,Scott L (BPA) - EWP-4

Sent: Tue Jan 21 14:31:11 2020

To: Rich Zabel (NOAA Federal); Daniel Widener - NOAA Affiliate; Michele Dehart; jim.faulkner@noaa.gov

Cc: Chamberlain, Charles B CIV USARMY CENWW (USA); Susan Camp BOR

Subject: Re: CRSO Modeling - Preferred Alternative

Importance: High

Colleagues,

(b) (5) [redacted]

If you have questions or concerns, please let us know.

Scott
503.230.3594
(for the Fish tech team)

-----Original Message-----
From: Chamberlain, Charles B CIV USARMY CENWW (USA) <Charles.B.Chamberlain@usace.army.mil>
Sent: Friday, December 13, 2019 11:05 AM
To: Rich Zabel (NOAA Federal) <rich.zabel@noaa.gov>; Daniel Widener - NOAA Affiliate <Daniel.Widener@noaa.gov>
Cc: Michele Dehart <mdehart@fpc.org>; jim.faulkner@noaa.gov; Susan Camp BOR <scamp@usbr.gov>; Donahue,Scott L (BPA) - EWP-4 <sldonahue@bpa.gov>
Subject: [EXTERNAL] RE: [Non-DoD Source] Re: CRSO Modeling - Preferred Alternative

Rich,

(b) (5) [redacted]

[redacted]

Charles Chamberlain
Biologist
US Army Corps of Engineers
Walla Walla District
201 North 3rd Avenue
Walla Walla, WA 99362
509-527-7298

-----Original Message-----
From: Rich Zabel (NOAA Federal) [mailto:rich.zabel@noaa.gov]
Sent: Friday, December 13, 2019 11:01 AM
To: Daniel Widener - NOAA Affiliate <Daniel.Widener@noaa.gov>
Cc: Chamberlain, Charles B CIV USARMY CENWW (USA) <Charles.B.Chamberlain@usace.army.mil>; Michele Dehart <mdehart@fpc.org>; jim.faulkner@noaa.gov; Susan Camp BOR <scamp@usbr.gov>; Donahue,Scott L (BPA) - EWP-4 <sldonahue@bpa.gov>
Subject: [Non-DoD Source] Re: CRSO Modeling - Preferred Alternative

Hi Chuck,

[redacted]

On Dec 12, 2019, at 11:39 AM, Daniel Widener - NOAA Affiliate <Daniel.Widener@noaa.gov <mailto:Daniel.Widener@noaa.gov> > wrote:

Hello Chuck,

[redacted]

(b) (5) [redacted], [redacted]

Dan

On Thu, Dec 12, 2019 at 11:21 AM Chamberlain, Charles B CIV USARMY CENWW (USA) <Charles.B.Chamberlain@usace.army.mil <mailto:Charles.B.Chamberlain@usace.army.mil> > wrote:

Modeling Team,

(b) (5) [redacted]

Charles Chamberlain
Biologist
US Army Corps of Engineers
Walla Walla District
201 North 3rd Avenue
Walla Walla, WA 99362
509-527-7298

--

Daniel Widener
Contractor with Ocean Associates, Inc.
Fish Ecology Division

****
Rich Zabel
Director, Fish Ecology Divsion

NOAA Fisheries

Northwest Fisheries Science Center
office: (206) 860-3290
cell: [redacted] (b) (6)
****

From: Michele Dehart

Sent: Fri Jun 28 13:46:40 2019

To: Julie Doumbia (jadoumbia@bpa.gov)

Subject: [EXTERNAL] FW: CSRO Document

Importance: Normal

Attachments: CRSO-41.pdf

Hello Julie:

Attached are our comments on the portion of draft Chapter 3 of the CRSO EIS, which you provided for review on June 24.

Please do not hesitate to call if you have any questions.

Thank You for the opportunity to review the draft.

Michele DeHart, Manager

The Fish Passage Center

FISH PASSAGE CENTER

847 NE 19th Ave., Suite 250, Portland, OR 97232
Phone: (503) 833-3900 Fax: (503) 232-1259
http://www.fpc.org/
e-mail us at fpcstaff@fpc.org

MEMORANDUM

TO: Julie Doumbia, BPA

(b) (6) [redacted]

FROM: Michele DeHart

DATE: June 28, 2019

RE: Review of Draft CRSO Chapter 3 – Environmental Consequences, 3.4.3.1 - 3.4.3.2 Modeling

In response to your request, the Fish Passage Center (FPC) staff and the Comparative Survival Study (CSS) Oversight Committee reviewed the draft section of Chapter 3, which you provided by email on June 24, 2019. This is a partial and rough draft of Chapter 3 (Draft), which only includes results for spring/summer Chinook. We understand that subsequently additional portions of Chapter 3 will be provided for review. We have developed these comments according to your instructions (attached), only comment and review the components that the FPC/CSS have developed. We do have comments on the other components of this draft but will reserve them for submittal at a later time as per your instructions. We offer the following review comments and recommendations for your consideration in development of the ensuing draft of Chapter 3 of the CRSO EIS.

General Comments
The FPC and the CSS Oversight Committee carried out extensive analyses of the Action Agencies' CRSO Environmental Impact Statement (EIS) Alternatives and provided those analyses to the action agencies on April 29, 2019. These included the Grande Ronde watershed life-cycle model analyses for spring Chinook and a suite of cohort model analyses that utilize all Snake River population mark groups.

The current Chapter 3 Draft does not accurately reflect CSS/FPC analyses. Many important component results of those analyses were omitted in the Chapter 3 Draft. Specifically, the following results of analyses were omitted:

- Predicted smolt-to-adult return rates (SARs) from both the life-cycle and cohort models
- Abundance estimates from the life-cycle model
- Predicted ocean survivals for the cohort models
- Predicted Transport:In-river ratios

While metrics like juvenile survival, juvenile travel time, proportion transported and powerhouse passage events are included in both the written and tabular presentations in the Chapter 3 Draft (Tables 1-4), the predicted smolt-to-adult return rates (SARs) and abundance from Grande Ronde life-cycle model analyses, ocean survival rates, and Transport:In-river ratios from the cohort model analyses for each CRSO alternative are not included in the current draft. These predicted smolt-to-adult return (SAR) rates are an extremely important metric for evaluating the relative efficacy the EIS alternatives. In addition, the region has adopted a goal of SARs averaging 4% for listed Snake River and Upper Columbia salmon and steelhead (NWPCC 2014). Each CRSO alternative should be considered relative to each other and relative to that regional goal by presenting the predicted SARs and the ranges around those SARs for each alternative. The 25% - 75% quartile ranges around predicted SARs for the cohort models were provided to the action agencies in document CRSO-33, and submitted to the action agencies on June 14, 2019. The low end of the range of predicted SARs should be given considerable attention, because future climate change conditions could produce SARs at the low end of the range more often than has occurred historically. In fact, the range of uncertainty in model predictions is representative of past extremes, and should therefore be treated as cautionary examples of potential future conditions. We recommend that the draft provide the predicted SARs for the life-cycle model and the cohort models for each alternative, consistent with the manner that predicted in-river survival rates and fish travel times are provided in the current draft. Providing the predicted SARs in no way precludes, and in fact more clearly supports comparisons of the relative effects of each alternative against the No Action Alternative.

Throughout the Chapter 3 Draft, the results of the CSS cohort models and the Grande Ronde life-cycle model are not distinguished. The authors should be careful to distinguish and discuss the cohort models and Grande Ronde life-cycle model results separately without conflating the two. The cohort models are representative of all the Snake River populations, while the Grande Ronde life-cycle model focuses on SARs and abundance of spring Chinook populations from the Grande Ronde/Imnaha Major Population Group.

Several sections of the Chapter 3 Draft are identified by title but no text is provided. Specifically, the titles “Juvenile and Adult TDG Exposure” and “Qualitative Analyses of Adult Migration/Survival Measures” are included without text. Since these sections of the Chapter 3 Draft were not available for review, it is not possible to determine if the following analyses, which are directly relevant to these sections of the draft EIS, will be included:

- Attached to the June 14, 2019 responses to BPA questions is a report submitted to the ISAB titled “Documentation of Experimental Spill Management: Models, Hypotheses, Study Design and Responses to the ISAB”. Chapter 3 of this document includes extensive analyses of the effects of Total Dissolved Gas levels on juvenile salmon and steelhead survival showing no effect on survival of TDG levels up to 125%. These analyses are directly relevant to the EIS Chapter 3 Draft section titled "Juvenile and Adult TDG Exposure".

- Chapter 3 of the 2017 and 2018 CSS Annual reports include analyses of the effects of Total Dissolved Gas on survival and instantaneous mortality rates for juvenile Chinook salmon and steelhead. These analyses are also relevant to the section titled "Juvenile and Adult TDG Exposure". These analyses are available to the public on the FPC website and should be included in the EIS.
- The FPC/CSS and others have completed quantitative analyses of adult salmon upstream migration and survival. These quantitative analyses are relevant to the EIS and indicate that water temperature and juvenile downstream passage history, particularly smolt transportation, affect adult upstream migration. These existing quantitative analyses would better inform the CRSO EIS than reliance on qualitative analyses and should be included in the EIS. These are available to the public in the CSS Annual Reports and in individual memorandums on the FPC web site. We are happy to provide these documents to you on request.

The CSS life-cycle model and cohort model analyses all showed that the proposed Powerhouse Surface Passage (PSP) structures had little to no effect on the performance metrics, but these results are not clear in the Chapter 3 Draft. The Draft should be revised to clearly report these results for all of the CSS analyses.

Specific Comments
In addition to the general comments provided above, we offer the following Specific Comments:

Line 38-40, page 32 –"The COMPASS and CSS modeling results support our qualitative expectations that the MO1 survival rates from the lower Snake River to below Bonneville Dam would increase slightly and travel times would be reduced slightly."
We recommend that the specific results provided by CSS/FPC in analyses of CRSO alternatives be reflected in the EIS rather than providing an interpretation or translation of those results, which could be misleading to the public. In the analytical results provided to the action agencies of CSS analyses, it is more accurate to say that MO1 and the NAA alternatives were similar across all of the life-cycle model and cohort model analyses. Based upon CSS/FPC analyses, it is not accurate to represent MO1 as even a "slight improvement" over the No Action Alternative.

Line 43-44, page 3-2 –[effect of transporting SR spring/summer Chinook salmon smolts from Apr 15-Apr24 in terms of TIR ratio]
The effect of beginning the smolt transportation program earlier, April 15 – April 24, has been analyzed in an FPC memorandum #13-19 and provided to the fishery management agencies and posted on the FPC website, dated March 22, 2019. Based on fish tagged at LGR, we found no evidence that starting transportation earlier would have improved Transport:Bypass ratios (2007-2015) for hatchery and wild yearling Chinook. We recommend that the consideration of actions that increase smolt transportation in the EIS should also include a summary of the detrimental effects of transportation on adult upstream migration success that have been documented.

Line 50, page 3-2, highlighted text, [discussion of CSS results in this paragraph too, i.e. why seeing higher % transported in this alternative]

For the CSS life-cycle model, estimates of proportion transported were a function of the estimated cumulative PITPH at the three transportation projects (LGR, LGS, and LMN) and the specified start date for transportation at LGR and LGS (see CRSO-33, page 12). MO1 calls for transportation to begin on April 15th, while the NAA has transportation beginning on April 25th. Even though MO1 resulted in reduced PITPH when compared to the NAA, the impact of the earlier start date for MO1 was sufficient enough to result in an overall higher estimate of proportion transported under MO1. One would expect an earlier start date of transportation (10 days), as proposed by the action agencies, to precipitate a higher overall estimate of proportion transported.

Line 57, page 3-2 Comment [JAD1]: Wild and hatchery fish differ in survival, migration rate, transportation probability, and detection probability – this is main reason for differences between COMPASS and CSS NAA values, correct?

We have no basis to assess the accuracy of this statement. The differences were likely caused by different model structures and underlying assumptions between COMPASS and CSS. However the instructions included in the request to review this Chapter 3 Draft specifically precluded review of COMPASS analyses and results. Without detailed review of the COMPASS data and assumptions, Comment [JAD1] is speculative and we cannot agree that this statement is correct.

Footnote #1 and #3 of Table 1, page 3-2 (and throughout document) – "The CSS models consider Ice and Trash Sluiceways (ITSs) to be a powerhouse passage route due to their outfall location…"

The footnotes, as written, are misleading and incomplete. The models used by the CSS to estimate PITPH considered the existing ITSs at The Dalles Dam and the Bonneville Dam First Powerhouse to be powerhouse passage routes. The decision to treat the ITS at The Dalles Dam as a powerhouse passage route was made because: 1) smolts enter the ITS in a similar manner as smolts entering bypass systems at the other dams, 2) smolts exiting the ITS follow a similar route in the tailrace as smolts that pass through the turbines, 3) smolts that use the ITS have similar tailrace egress times as smolts that pass through the turbines, and these tailrace egress times are approximately double those of smolts that pass via the spillway (Johnson et al. 2007), and 4) smolts that exit the ITS pass near or through zones of high predator (northern pikeminnow and smallmouth bass) density in the tailrace (Duran et al. 2003), and this predator exposure is expected to be similar to smolts that pass through the turbines. A detailed discussion of the ITS at The Dalles Dam was provided in the September 28, 2017 FPC Memorandum 44-17 that was sent to Jason Sweet (BPA). Because these same rationales also apply to the existing ITS at the Bonneville Dam First Powerhouse, it too was treated as a powerhouse passage route. However, the CSS treated all future powerhouse surface passage routes as a spill passage route when estimating PITPH under the assumed 10%, 20%, and 30% passage efficiencies for these routes. These footnotes are repeated throughout the document and should be amended for accuracy in each instance in which it is repeated to provide the complete set of reasons for treating these ITSs as a powerhouse passage route (e.g., Table 3, Table 4).

Line 61-65, Page 3-3. The multiple hypotheses about latent effects of the hydrosystem represent a range of ideas... ISAB (2007) concluded that "the hydrosystem causes some

fish to experience latent mortality, but strongly advises against continuing to try to measure absolute latent mortality, Latent mortality relative to a damless reference is not measurable"

This is a misleading discussion of latent/delayed mortality from ISAB 2007, and the selected quote is presented without context which results in misinterpretation of the ISAB statement. The ISAB statement is based on a narrow definition of latent mortality as an absolute value relative to pre-dam conditions, as follows: "We define latent mortality associated with the FCRPS (for Snake River fish) as any mortality that occurs after fish pass Bonneville Dam as juveniles that would not occur if the FCRPS did not exist." (ISAB 2007). The ISAB, in the same concluding paragraph state that, "Efforts would be better expended on estimation of processes, such as in-river versus transport mortality that can be measured directly." This recommendation by the ISAB is precisely the approach utilized in the CSS methodology as explained in the written response to action agencies questions submitted on June 14, 2019. The ISAB recognizes latent/delayed mortality; this quote does not discount the validity or applicability of the presence of latent mortality effects. The ISAB only raises doubt about expending effort to identify an absolute value for delayed mortality. As explained in previous submittals, the CSS methodology does not require absolute values of delayed mortality. Delayed mortality, at whatever level it occurs, is captured in SARs.

Line 72-77, Page 3-3 "The CSS LCMs similarly incorporate several latent effects hypothesis….."

Consistent with your instructions to limit comments only to CSS model analyses, we will not comment on the discussion of treatment of latent/delayed mortality in the COMPASS model.

This discussion of latent and delayed effects in the CSS models (starting on line 72) is not correct. The CSS model analyses **do not attempt to attribute latent mortality to any specific hypothesis.** The CSS modelling approach does not require, as explained in documents provided to the action agencies, the development of hypothesis regarding the process of delayed/latent mortality. CSS analyses generate fish metrics, specifically SARs which incorporate mortality that occurs in the estuary and ocean. It is not necessary to hypothesize latent mortality in CSS modelling. The effects of latent mortality are statistically consistent in both life-cycle models and cohort models and are mechanistically linked to the powerhouse passage experience. SAR estimates from CSS life-cycle models explicitly account for all mortalities, including latent mortalities; therefore additional hypothesis to incorporate latent mortality are not necessary.

Having been developed in an empirical statistical framework, CSS models make no assumptions about latent mortality, yet the models (or estimated parameters) intrinsically capture these effects. Parameters are not arbitrarily manipulated in CSS models to represent hypothesized latent effects; instead the long time series of direct observations informs the direction and magnitude of latent effects inherent in the CSS models.

Lines 122-124 Pages 3-4, 3-8, 3-11, 3-15 Yellow Highlighted areas: [Discussion of results: NWFSC and CSS modelers, would be helpful if you know which factors were driving the differences in results relative to NAA. For example, lower PITPH and faster travel time or more/less fish transported.]

The coefficients for the CSS cohort model were provided in Appendix D of CRSO-33. This provides information on which factors/variables were included in the estimation of juvenile survival, fish travel time, ocean survival, SARs, and TIRs. The sign and magnitude of these coefficients provides insight on how large an impact each of the included variables had on the estimation of these metrics.

Table 2, Page 3-8 Comment [JAD8]: Was transportation from PHSP structure @MCN included in CSS modeling? Sounds like no, need to confirm. CSS modeling did not model any change in transport from powerhouse surface passage structure presence – CRSO-33 p. 12
The CSS modeling did not include any transportation from McNary Dam for MO2. The model that the CSS used to estimate proportion transported for the life-cycle model was based on actual estimates of proportion transported from the CSS and corresponding estimates of cumulative PITPH from the three transportation sites and transportation start dates for migration years 1994-2017. These data are almost exclusively from years where spring transportation from McNary did not occur. Transportation of spring migrants at McNary was terminated on the basis of studies that indicated that there was no beneficial and potentially detrimental effect of smolt transportation at McNary.

Thank you for the opportunity to review the draft.

From: Doumbia,Julie A (BPA) - EC-5 [mailto:jadoumbia@bpa.gov]
Sent: Monday, June 24, 2019 8:38 AM
To: Daniel Widener - NOAA Affiliate; James Faulkner - NOAA Federal; Michele Dehart; Rich Zabel - NOAA Federal
Cc: Chuck Chamberlain (NWW); Sue Camp (scamp@usbr.gov); Petersen,Christine H (BPA) - EWP-4; Hauser,Tracy L (BPA) - EWL-4
Subject: REVIEW REQUESTED BY JUNE 28: SR Sp/Su Chinook modeling

Hello Fish Modelers,

(b) (5)
[redacted]

(b) (5)
[redacted]

Julie

Julie Doumbia
Environmental Protection Specialist
BONNEVILLE POWER ADMINISTRATION
bpa.gov | P 503-230-7641 | C(b) (6) [redacted]

From: Michele Dehart

Sent: Mon Apr 29 15:35:36 2019

To: 'ED.Bowles@state.or.us'; Tucker Jones (tucker.a.jones@state.or.us); Garrity, Michael D (DFW) (Michael.Garrity@dfw.wa.gov); 'Bill Tweit (tweitwmt@dfw.wa.gov)'; 'Rob Lothrop (lotr@critfc.org)'; lance Hebdon; Julie Doumbia (jadoumbia@bpa.gov); Chuck Chamberlain (Charles.B.Chamberlain@usace.army.mil); Steve_Haeseker@fws.gov; Rawding, Daniel J (DFW) (Daniel.Rawding@dfw.wa.gov); Adam Storch (adam.j.storch@state.or.us); Robert Lessard (LESR@critfc.org); Hauser,Tracy L - KEWL-4 (tlhauser@bpa.gov); Tom Iverson (t.k?iverson@comcast.net); Art Martin; Jay Hesse (jayh@nezperce.org); Kiefer,Russell (russ.kiefer@idfg.idaho.gov); 'Tom Lorz (lort@critfc.org)'; tim.copeland@idfg.idaho.gov

Cc: Randy Fisher (RFisher@psmfc.org); Jerry McCann; Brandon Chockley; Bobby Hsu; Gabriel Scheer; Erin Cooper

Subject: [EXTERNAL] CSS modeling of CRSO EIS alternatives

Importance: Normal

Attachments: CRSO-24.pdf

Julie and Chuck and Tracy:

Attached are the results of CSS modelling analyses of all of the CRSO EIS operations alternatives compared to the No Action Alternative.

The CSS Oversight Committee and the Fish Passage Center, agreed to utilize CSS methodologies to analyze the CRSO EIS operation alternatives and provide results to the CRSO Fish Technical Team by April 29, 2019.

These analyses are based upon the 80 year water record data sets provided to the Fish Passage Center by BPA and the USACOE.

Michele DeHart, Manager

The Fish Passage Center

FISH PASSAGE CENTER

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MEMORANDUM

TO: Julie Doumbia, BPA
Fish Technical Team
(b) (6) [redacted]

FROM: Michele DeHart, FPC

DATE: April 29, 2019

RE: Comparative Survival Study (CSS) Analysis of CRSO Operation Alternatives

In response to requests from the action agencies, Bonneville Power Administration (BPA), the US Army Corps of Engineers and the Bureau of Land Management, the Comparative Survival Study Oversight Committee (CSSOS) and the Fish Passage Center (FPC) have completed analyses of the five operations alternatives being considered in the Columbia River Systems Operations (CRSO) Environmental Impact Statement (EIS). The FPC and the CSSOC have successfully completed analyses of the CRSO alternatives by our established target date of April 29, 2019. As previously agreed, the federal agencies CRSO EIS alternatives have been evaluated utilizing CSS methodologies and metrics. All CSS analytical methods are documented in CSS Annual Reports (McCann et al. 2017, 2018) and in Documentation of Experimental Spill Management: Models, Hypotheses, Study Design, and response to ISAB (CSSOC 2017). These documents are available to the public at www.fpc.org.

As discussed in early conversations regarding the action agencies request, the CSSOC and the FPC have utilized well-documented and regionally-reviewed CSS analytical methodologies, models, and metrics in analyzing the CRSO operations alternatives. A suite of models were utilized to analyze the CRSO operations alternatives. The CSS Life Cycle Model was applied to analyze expected Smolt-to-Adult Return rates (SARs) and adult spawning ground abundances for six tributary populations of Chinook salmon in the Grand Ronde Basin. CSS models were also applied to analyze expected juvenile survival, juvenile Fish Travel Time (FTT), ocean survival, SARs, and Transport:In-river Ratios (TIRs) for yearling Chinook salmon and steelhead from the Snake River Basin. The 80-year water record and predicted flow and spill data sets for each CRSO alternative, provided by BPA, were utilized in these analyses.

There are two primary objectives of these analyses. First, we analyze the relative performance in CSS metrics among the established CRSO alternatives and second, we compare results of the analyses of the CRSO alternatives based on the 80-year water record with CSS analyses presented to the CRSO Fish Technical Team in September 2017. In addition, our analyses of CRSO alternatives included three levels of assumed passage efficiencies for proposed Powerhouse Surface Passage (PSP) structures, measures included in several of the CRSO alternatives. After review of the literature and studies related to surface powerhouse passage structures efficiencies, a range of assumed PSP efficiencies of 10%, 20% and 30% were included in the CSS analyses of alternatives. Our conclusions are listed in the following bulleted statements, followed by a detailed discussion and tabular presentation of the results.

Comparing past CSS results with CRSO results
The results of the analyses of CRSO alternatives, utilizing BPA inputs and the 80-year water record, align very closely with the CSS operations alternatives presented in the 2017 CSS Annual Report and presented to the CRSO Fish Technical Team in September 2017. This is an important point because the 2017 CSS analyses considered only changes in spill levels at each project and breach of the four lower Snake River dams. In contrast, each CRSO alternative has many different measures that were included in each alternative (e.g., PSP structures, high-capacity turbines). The alignment of the CSS 2017 results with the CRSO results indicate spill levels and breach are the primary measures affecting fish passage and survival metrics among these alternatives. In addition, the scenario of 125% TDG spill level at the Lower Columbia projects (MCN-BON) and breach was analyzed in CSS and was found to have the highest benefits in terms of fish performance metrics, but was not included in the CRSO alternatives. The similarities in results of the 2017 CSS analysis and the CRSO analyses indicate that the 2017 CSS operations scenarios could be considered in the CRSO EIS.

Relative comparison of CRSO multiple objective alternatives
Five operational alternatives were analyzed: the No Action Alternative (NAA), and Multiple Objectives Alternatives 1-4 (MO1, MO2, MO3, and MO4). Each of the Multiple Objectives Alternative are presented in comparison to the NAA as a baseline operation to illustrate the relative performance (Tables 2-18).

- **MO3**: MO3 demonstrated the greatest expected improvements compared to the NAA across all biological response metrics. Applying the CSS Life Cycle Model, Chinook salmon SARs and adult abundances in the spawning tributaries of the Grand Ronde were highest under MO3. Similarly, applying the cohort-specific SAR models (CSSOC 2017), Chinook salmon and steelhead SARs were highest under MO3. For yearling Chinook salmon and steelhead, juvenile fish travel times were lowest and juvenile survival rates were highest under MO3. Ocean survival rates for yearling Chinook salmon and steelhead were similarly highest under MO3.
- **MO4**: MO4 demonstrated large expected improvements compared to the NAA, but these improvements were less than those predicted under MO3. Applying the CSS Life Cycle Model, Chinook salmon SARs and adult abundances in the spawning tributaries of the

Grand Ronde / Imnaha Major Population Group under MO3 were substantially higher than under the NAA. Similarly, Chinook salmon and steelhead SARs, juvenile survival rates, and ocean survival rates under MO3 were substantially higher than under the NAA. Juvenile fish travel times and Transport:In-river Ratios (TIRs) were substantially lower under MO3 than under the NAA.

- **MO1**: MO1 demonstrated similar performance compared to the NAA across all biological response metrics.
- **MO2**: MO2 demonstrated substantial reductions in biological performance compared to the NAA across all biological response metrics. SARs, juvenile survival rates, and ocean survival rates were greatly reduced and juvenile fish travel times and TIRs were increased under MO2 compared to the NAA.

Performance relative to the regional 4% average SAR goals

Across the models evaluated for yearling Chinook and steelhead, alternatives MO3 and MO4 are the only alternatives that may be capable of meeting the Northwest Power and Conservation Council (NPCC) goal of SARs averaging 4%. The NAA, MO1, and MO2 alternative are expected to be well below the NPCC regional SAR goal.

CRSO assumptions and their effects on alternatives

- **Powerhouse surface passage structures and their assumptions regarding effectiveness**

Powerhouse surface structures are included in several of the CRSO multiple objective alternatives. The specific design and operations of these structures are not identified, however, passage effectiveness is assumed. To capture the sensitivity of the CRSO relative results to the assumed passage efficiency of powerhouse surface passage structures, CSS analyses included 10%, 20% and 30% passage efficiency levels for powerhouse surface passage. The results indicate that powerhouse surface passage has a very small effect on fish passage metrics, and model results. These results indicate that it is unlikely that powerhouse surface passage structures will have a meaningful affect on SARs, survival rates, and other biological response metrics.

- **High Capacity turbines are included as a measure in several of the CRSO alternatives. However, the data sets provided by BPA did not include increases in flow through the powerhouses due to the installation of high capacity turbines.**

Higher flow through turbines would increase powerhouse encounters for juvenile migrating fish and increase powerhouse encounter rates. The BPA data sets do not incorporate changes in powerhouse flow resulting from the installation of high capacity turbines.

Detailed Discussion Relative comparison of CRSO alternatives

CSS Life Cycle Analysis of productivity, abundance, and SARs

In 2017, the CSS used a life cycle model to compare predictions of in-river smolt survival, smolt to adult return rates (SARs), and long term predicted abundances of returning spawners of six Spring/Summer Chinook populations in the Grande Ronde / Imnaha major population group (MPG) (McCann et al. 2017). The analysis used a life cycle model that had been statistically validated against demographic and environmental trends, and that characterized uncertainty in estimated population demographic rates. The model simulated future trends based on empirically estimated demographic rates and simulated future conditions. Assumptions and methods are detailed in McCann et al. (2017).

This analysis makes use of the CSS model's underlying structure to simulate predicted population trends when supplied with FCRPS hydrosystem inputs and derived metrics that come from specified hydrosystem operation alternatives. The CRSO EIS Fish and Wildlife Technical Team supplied the CSS with hydrosystem metrics from an 80-year water record, which were used as inputs for CSS life cycle model simulations. Simulated future population trends using CRSO inputs are compared to the alternatives examined in McCann et al. (2017).

Data and Methods

The CSS life cycle model was statistically validated with historical spawner abundance data, smolt abundance data, empirically derived migration survival data, harvest data, and environmental variables used as predictors of survival probabilities. Validation was a retrospective analysis, but the resulting validated model was used to predict population trends under presumed future conditions, including hydrosystem conditions. Future conditions were simulated to mimic historically observed values using predictive sub-models (e.g.: sea surface temperature anomalies) and statistical resampling of historical conditions (e.g.: harvest and adult success). Rather than simulate yearly variation in juvenile migration conditions, the CSS analysis chose three years of known hydrosystem conditions that were distinct in term of hydrograph flow conditions (i.e., a high flow year, an average flow year, and a low flow year), and treated every year identically for the contrasts between distinct flow conditions. Upon each of the three distinct flow condition years, the CSS analysis imposed four hydrosystem operations alternatives: 1. The status quo BiOp spill levels, 2. Spill to 115% TDG limit at the forebay and 120% at the tailrace, 3. Spill to 120% TDG, and 4. Spill to 125% TDG. This resulted in twelve different scenarios for all combinations of the three flow levels and four spill levels. Twelve additional scenarios were evaluated using the same spill and flow conditions, but where the lower four Snake River dams are breached. A powerhouse passage index (PITPH) evaluated from PIT tag data and the water transit time (WTT) through the hydrosystem were derived at each of these twelve combinations. The values of PITPH and WTT are shown in Figure 1. The fixed values of PITPH and WTT were applied as constants each year in the simulations. The variability in simulated results came from the uncertainty in estimated parameters, variability in simulated ocean conditions, and resampling from empirical distributions of other historically observed conditions.

The replication of this analysis using CRSO inputs was performed by substituting the 2017 CSS scenario PITPH and WTT annual constants with a time series of PITPH and WTT derived from the 80 year time series of hydrosystem metrics predicted by CRSO hydro modelling. The CRSO technical team implemented multi-objective alternatives that predicted discharge routes of passage at specified temporal intervals, which were aggregated to time scales required to produce inputs to derive the CSS metrics. For comparison, a no-action alternative is implemented to represent status-quo management of the hydrosystem. The CRSO scenarios are described in Table 1.

Table 1 CRSO operational alternatives. NAA is the no-action alternative. MO1 - MO4 are multi-objective alternatives 1-4.

Scenario	Brief Description	Spring Spill	Summer Spill	Start of Transport	Powerhouse Surface Passage Routes	Fish Friendly Turbines
NAA	2016 FOP	2016 FOP	to Aug 31	May 1st	None	IHR, MCN
MO1	Block Design	Performance vs. 115%/120%	Performance Spill. Terminated as early as Aug. 1	April 15th	IHR, MCN	IHR, MCN, JDA
MO2	Spill to 110% TDG	110% TDG	110% TDG. Terminated on Aug. 1	April 25th	IHR, MCN, JDA	IHR, MCN, JDA
MO3	Breach Snake, 120% TDG in Mid-Columbia	120% TDG, not to exceed 150 Kcfs at BON	120% TDG, not to exceed 150 Kcfs at BON. Terminated on Aug. 1	None	MCN	IHR, MCN
MO4	125% TDG spill	125% Spill cap. Spring spill starts on March 1st	125% Spill cap, through Aug 31	April 25th	LGR, LGS, LMN, IHR, MCN, JDA	IHR, MCN, JDA

Whereas the 2017 CSS analysis held WTT and PITPH constant every year for each alternative, the CRSO metrics produced 80 years of PITPH and WTT predictions for input as life cycle model variables (see Figure 2 and Figure 3). For MO1-MO4, we additionally examined the sensitivity of powerhouse passage to the efficiency of surface passage. We looked at 10%, 20% and 30% passage efficiency alternatives. WTT is not sensitive to surface passage efficiency. The CSS model also requires the proportion of fish transported, which again were treated as constants in the 2017 CSS analysis, but are variable year to year in the CRSO inputs.

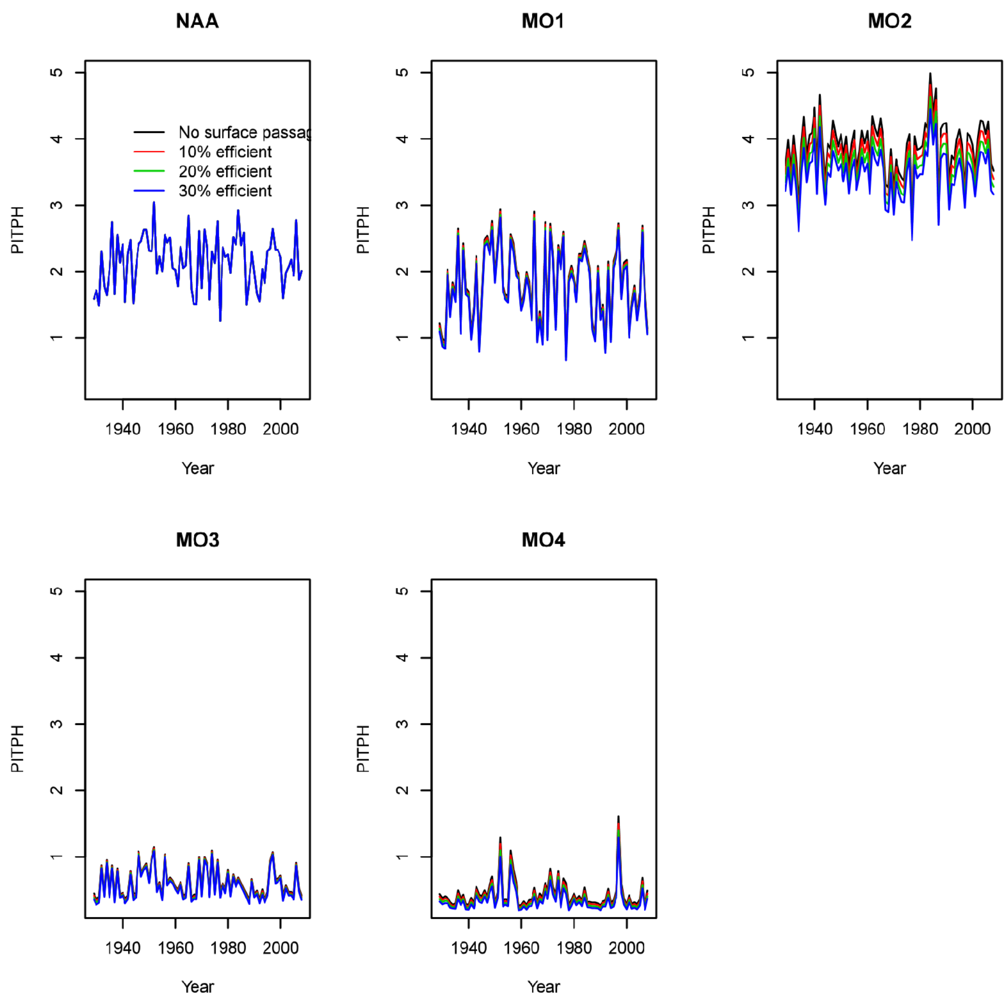

Figure 1 PITPH values derived from predicted hydrosystem conditions under CRSO alternatives.

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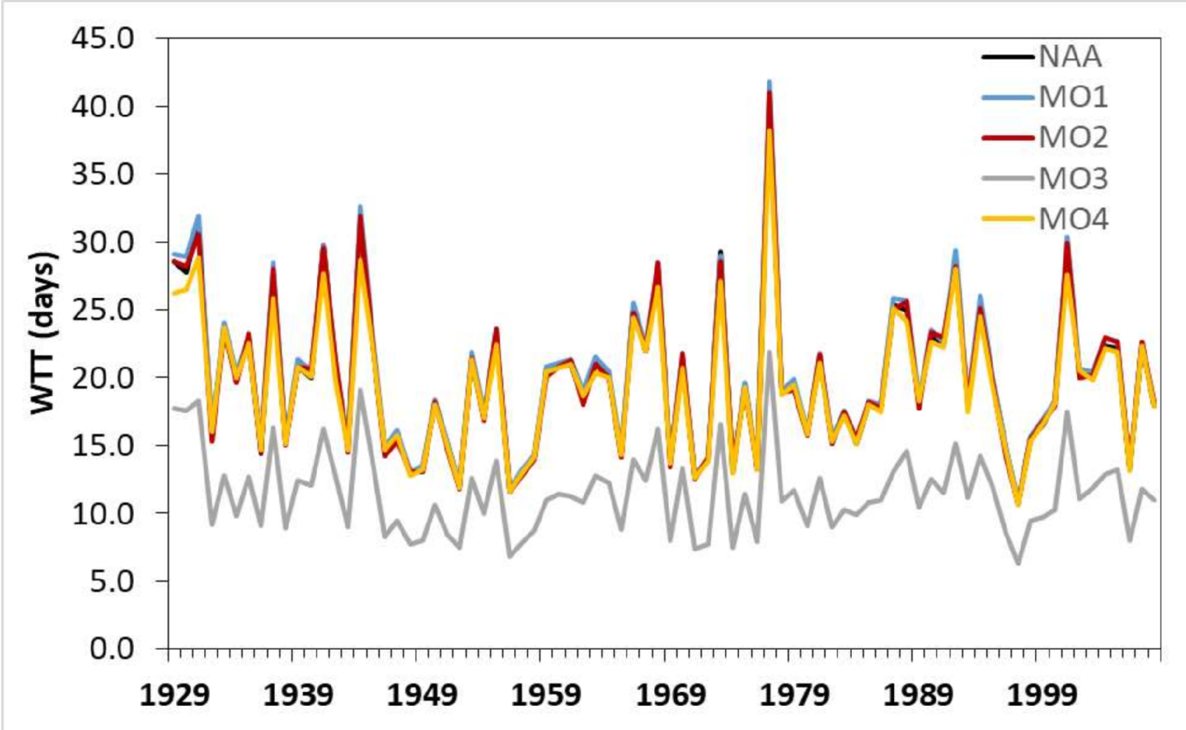

Figure 2 WTT values derived from predicted hydrosystem conditions under CRSO alternatives.

The 12 CSS simulated breach and non-breach alternatives and the 5 simulated CRSO alternatives differ only in the way PITPH, WTT and transport are treated. The 12 CSS breach and non-breach alternatives use the same PITPH and WTT value every year because each of the four CSS alternatives is replicated for one of three specific flow levels, whereas the CRSO alternatives use a different flow every year, and therefore have different PITPH and WTT every year. Transport in the CSS scenarios is a constant (20% when breached, or 0% breach scenarios) vs a predicted transport probability in the CRSO scenarios. Harvest is treated as a random draw from historical harvests. Ocean indices are simulated. (see McCann et al. 2017).

SARs and return abundances were calculated slightly differently from the methods in McCann et al. (2017). In this analysis, the two metrics were averages over a random 10 year period in the 80 year simulations for each simulated outcome. This is in contrast to always taking the average of the last 10 years in the 2017 report. All metrics are averages of 1000 simulations.

Results

We compared the simulated SARs and long term abundance metrics from the twelve CSS scenarios to the five CRSO alternatives with hydrosystem metrics shown in Figure 1 - Figure 4. The twelve CSS scenario predictions are shown in Figure 5 - Figure 8. The 5 CRSO alternative scenario predictions using CRSO simulated hydro data are shown in Figure 9 - Figure 12. All figures show median predictions with 25%-75% confidence regions. The median values are shown in Tables 2-9.

The predictions from using the CRSO scenarios is comparable to predictions using the CSS scenarios. The CSS scenarios predict the highest abundances and SARs at the 125% spill level (approximately 4% SAR). Comparatively, the CRSO multi-objective MO4 predicts the same performance at approximately a 4.5% SAR. The CRSO no-action alternative (NAA) predicts roughly the same SAR as the CSS BiOp scenario. CRSO MO3 is roughly equivalent in nature to CSS 120%. Both predict SARs of approximately 5%. CRSO MO1 is a block design scenario. It predicts approximately the same SARs as CRSO NAA and CSS BiOp scenarios. CRSO MO2 is a power production alternative with 110% TDG cap limit, and predicts significantly lower SARs and average abundances than all other alternatives.

Model Predictions of CSS metrics Ocean Survival, SAR, juvenile fish travel time, juvenile fish survival and TIR relative to CRSO alternatives.

The CSSOSC has established models and metrics for assessing environmental variables such as spill and flow on juvenile fish migration and smolt to adult return rates (CSSOC 2017). The CSSOC utilized these methodologies to generate a relative comparison of the CRSO operations alternatives on juvenile fish travel time, juvenile fish survival, TIR, ocean survival and smolt-to-adult return rate. Operations data at each project across the 80-year water record were used as inputs for the models. For each cohort and water year, 10,000 random simulations were generated using the parameters described in the models presented in CSSOC (2017).

Results
Across all of the biological response metrics, MO3 demonstrated the greatest improvements relative to the NAA. MO4 also demonstrated substantial improvements in biological response metrics relative to the NAA, but responses were somewhat less than MO3. Detailed results under each alternative and PSP efficiency assumption are provided in Tables 14-18. Figures 6-15 display the results and relative performance under each alternative.

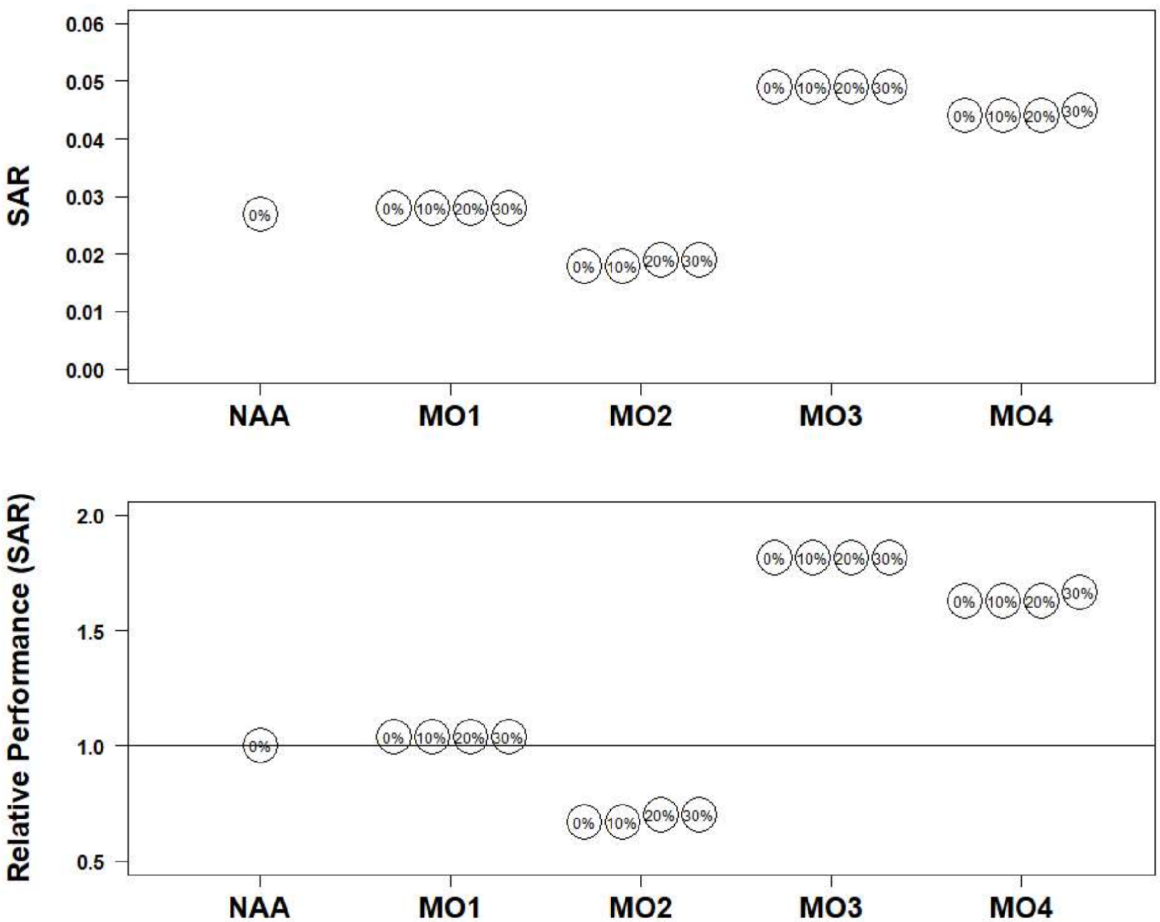

Figure 4. Life Cycle Model results of SARs and relative performance across alternatives.

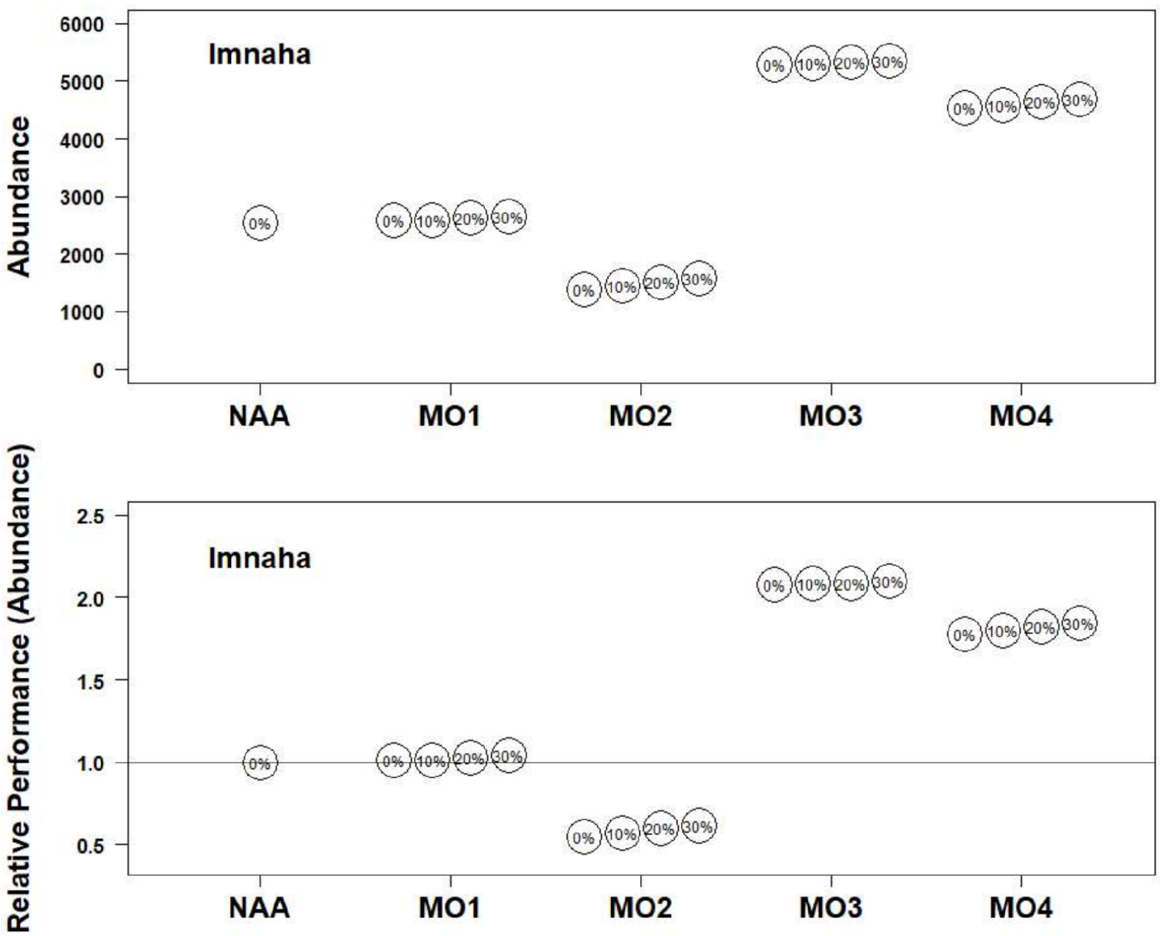

Figure 5. Life Cycle Model results of abundance and relative performance across alternatives for the Imnaha population.

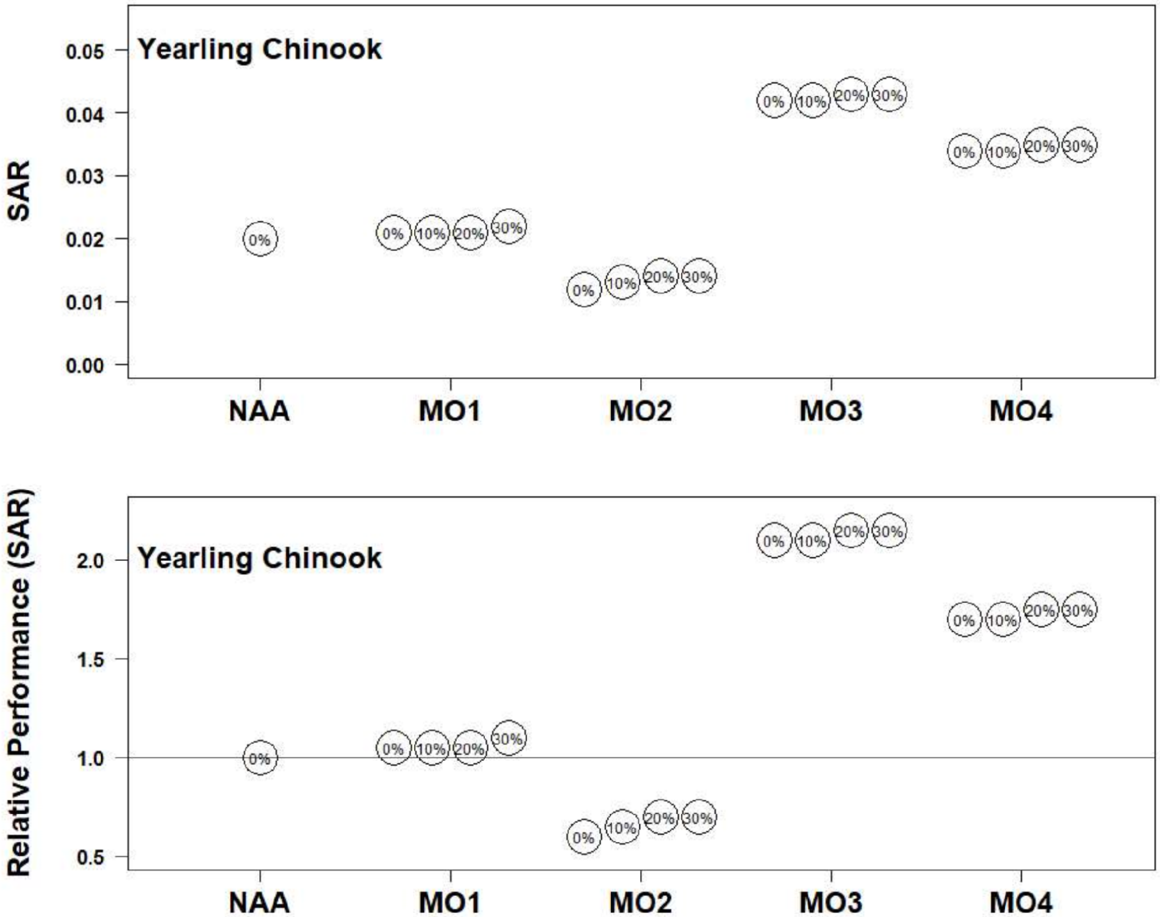

Figure 6. Yearling Chinook SARs and relative performance using the cohort-specific model.

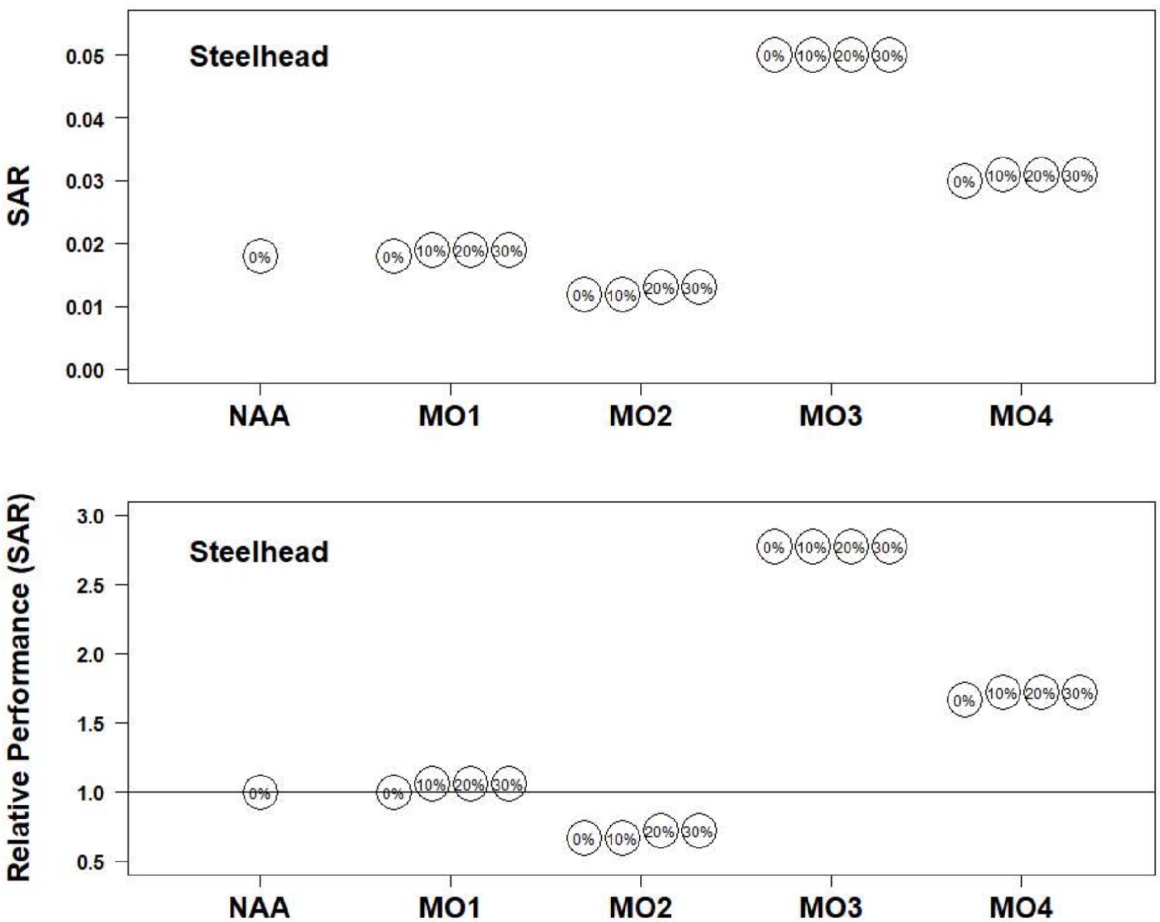

Figure 7. Steelhead SARs and relative performance using the cohort-specific model.

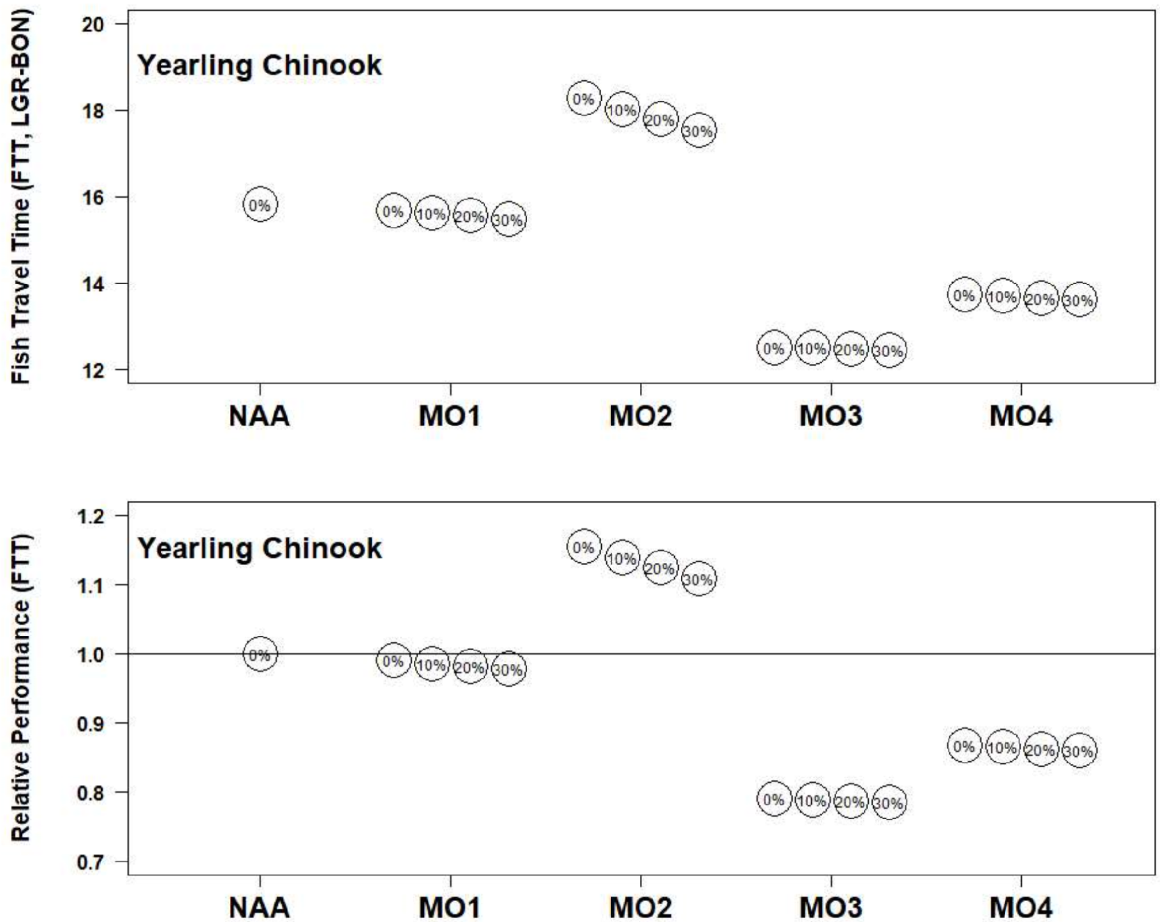

Figure 8. Yearling Chinook FTT and relative performance using the cohort-specific model.

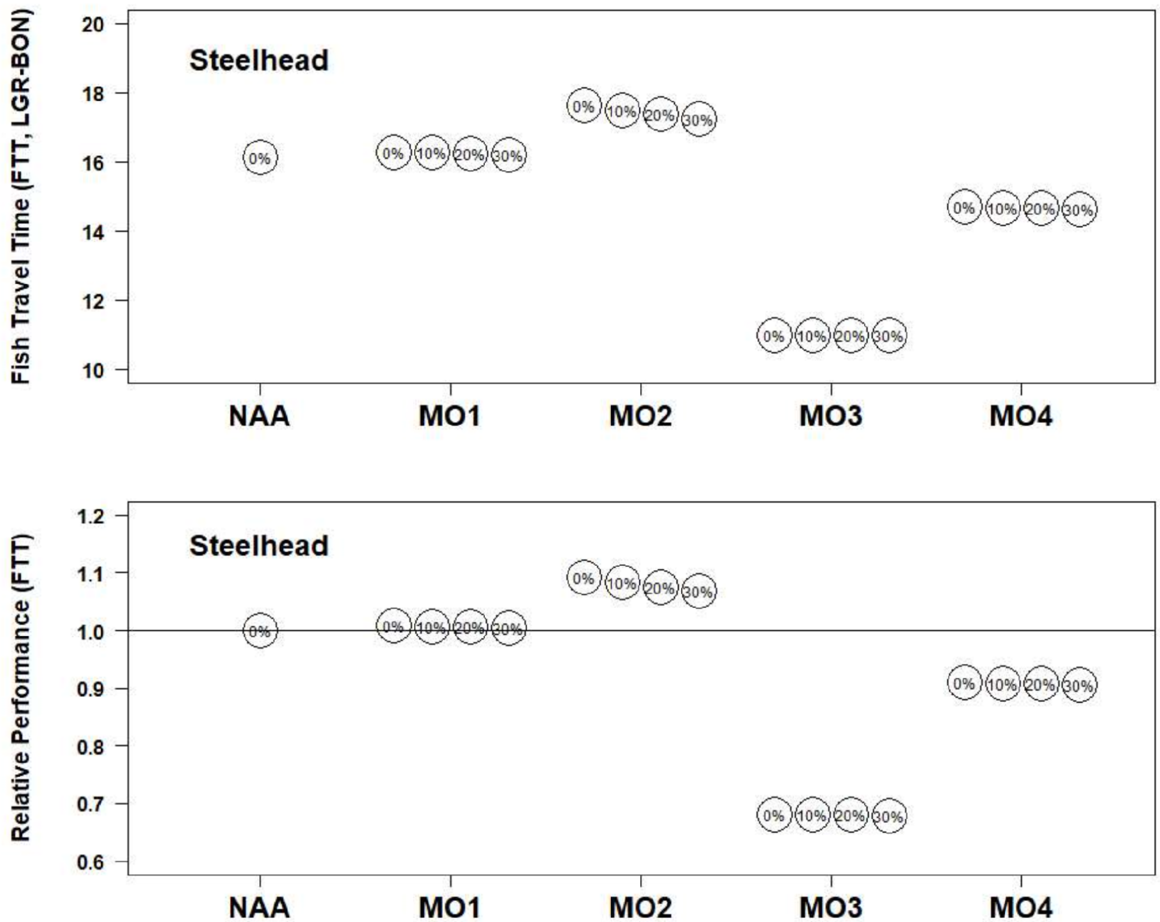

Figure 9. Steelhead FTT and relative performance using the cohort-specific model.

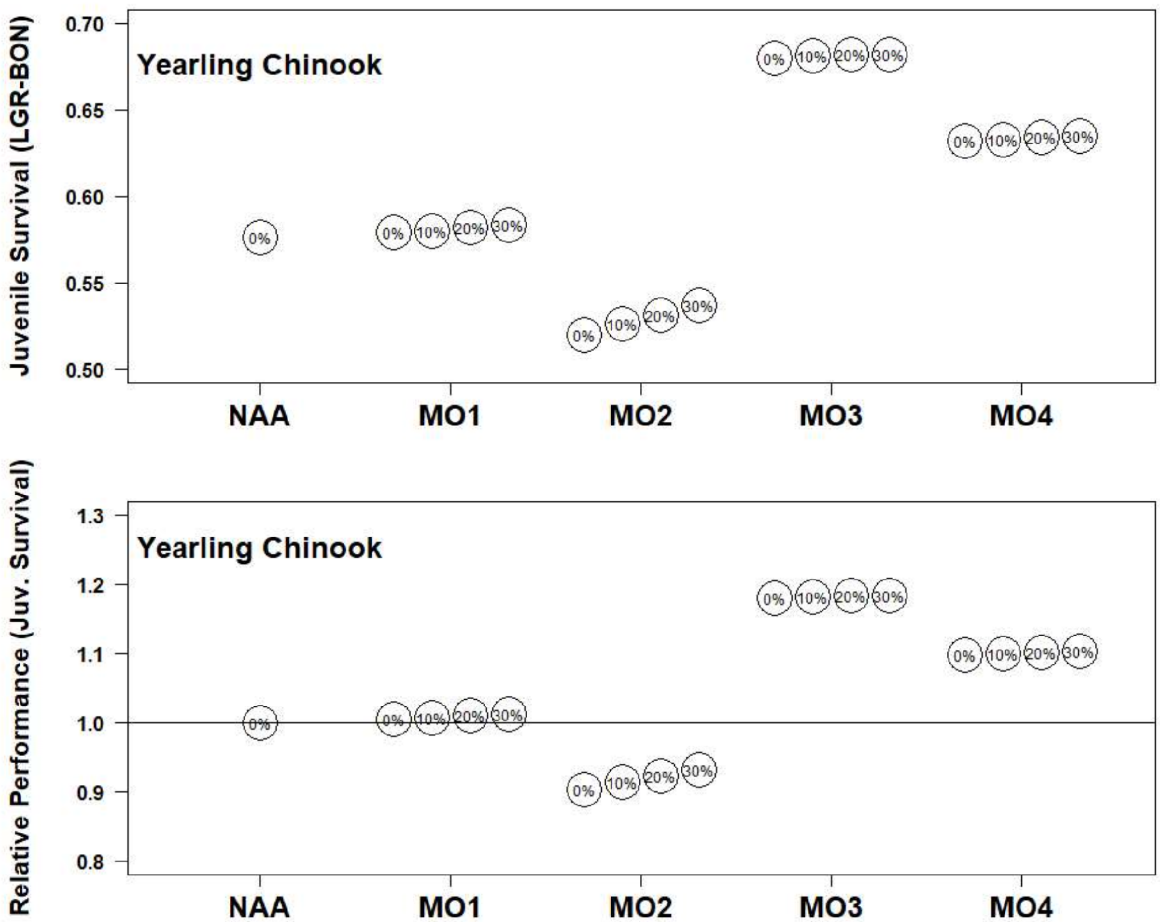

Figure 10. Yearling Chinook juvenile survival and relative performance using the cohort-specific model.

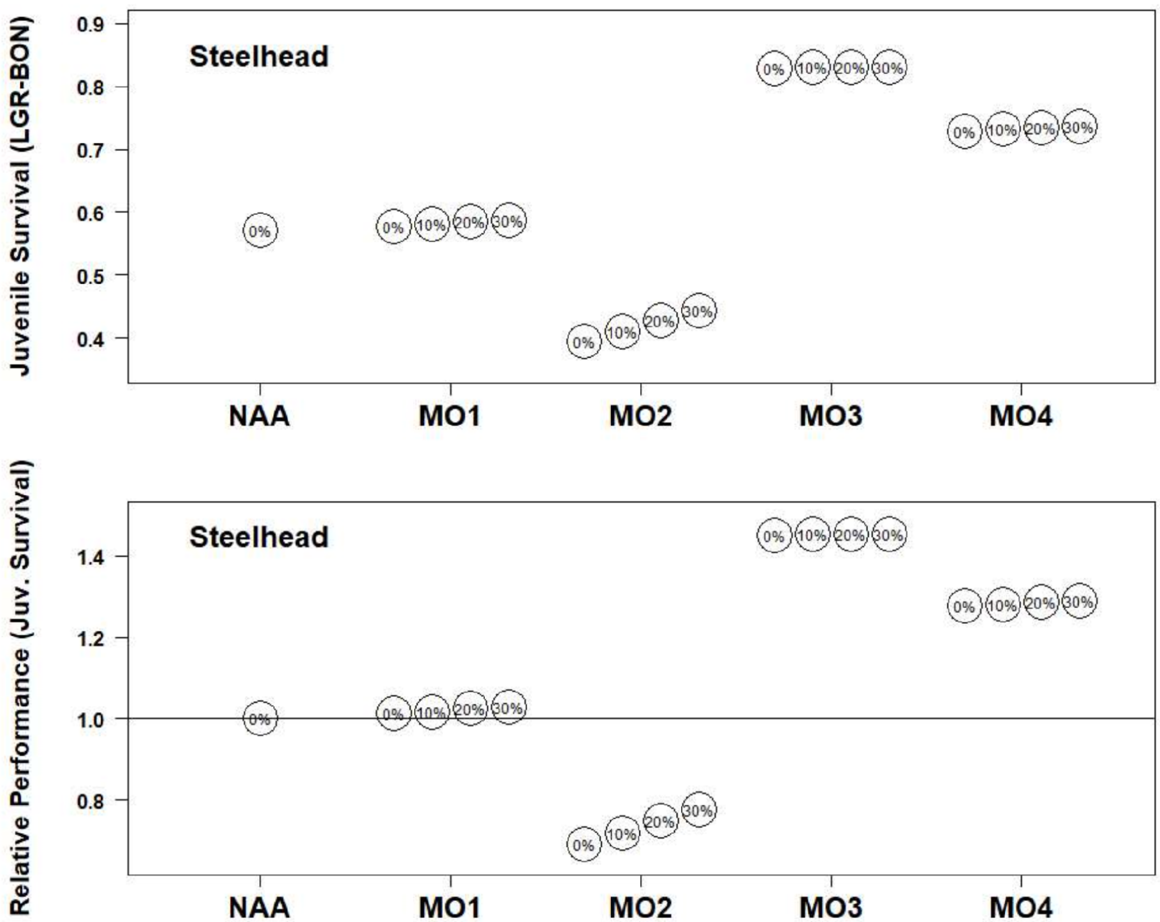

Figure 11. Steelhead juvenile survival and relative performance using the cohort-specific model.

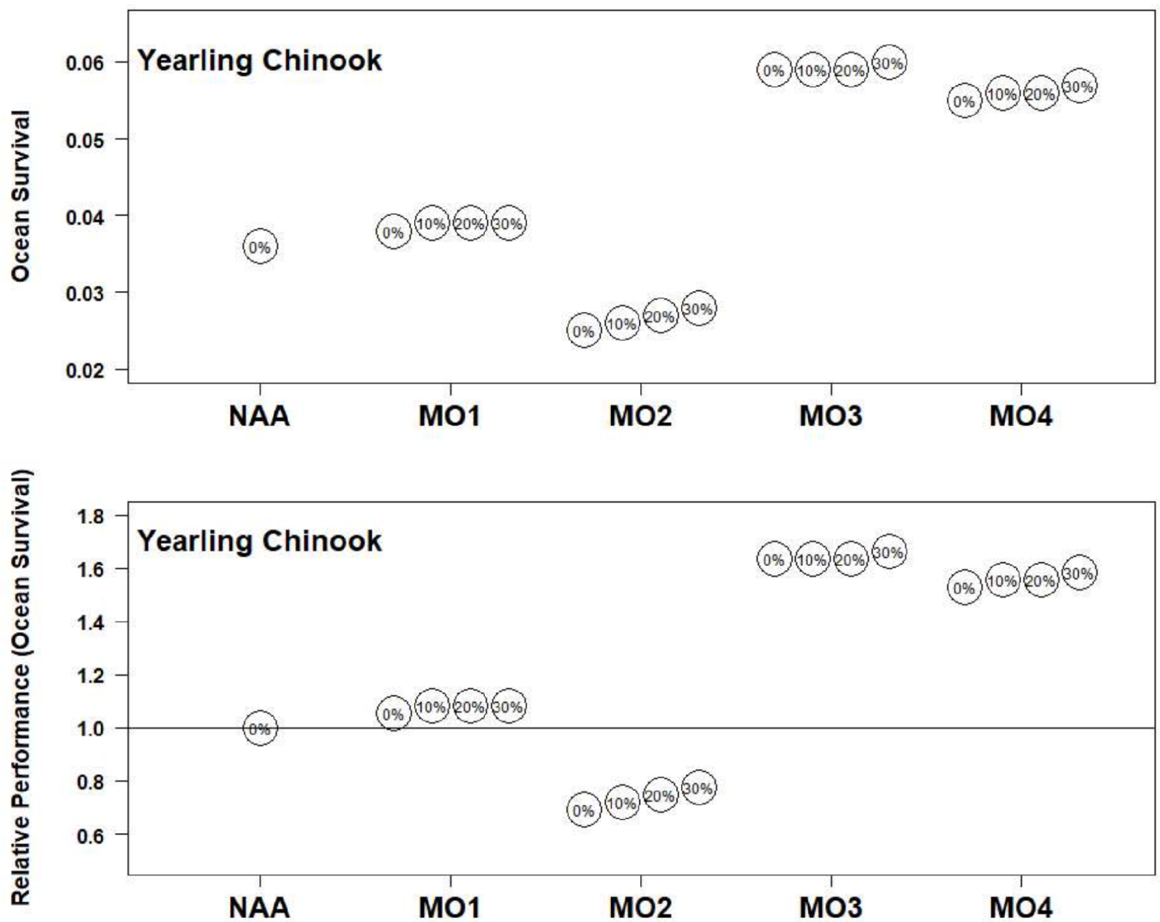

Figure 12. Yearling Chinook ocean survival and relative performance using the cohort-specific model.

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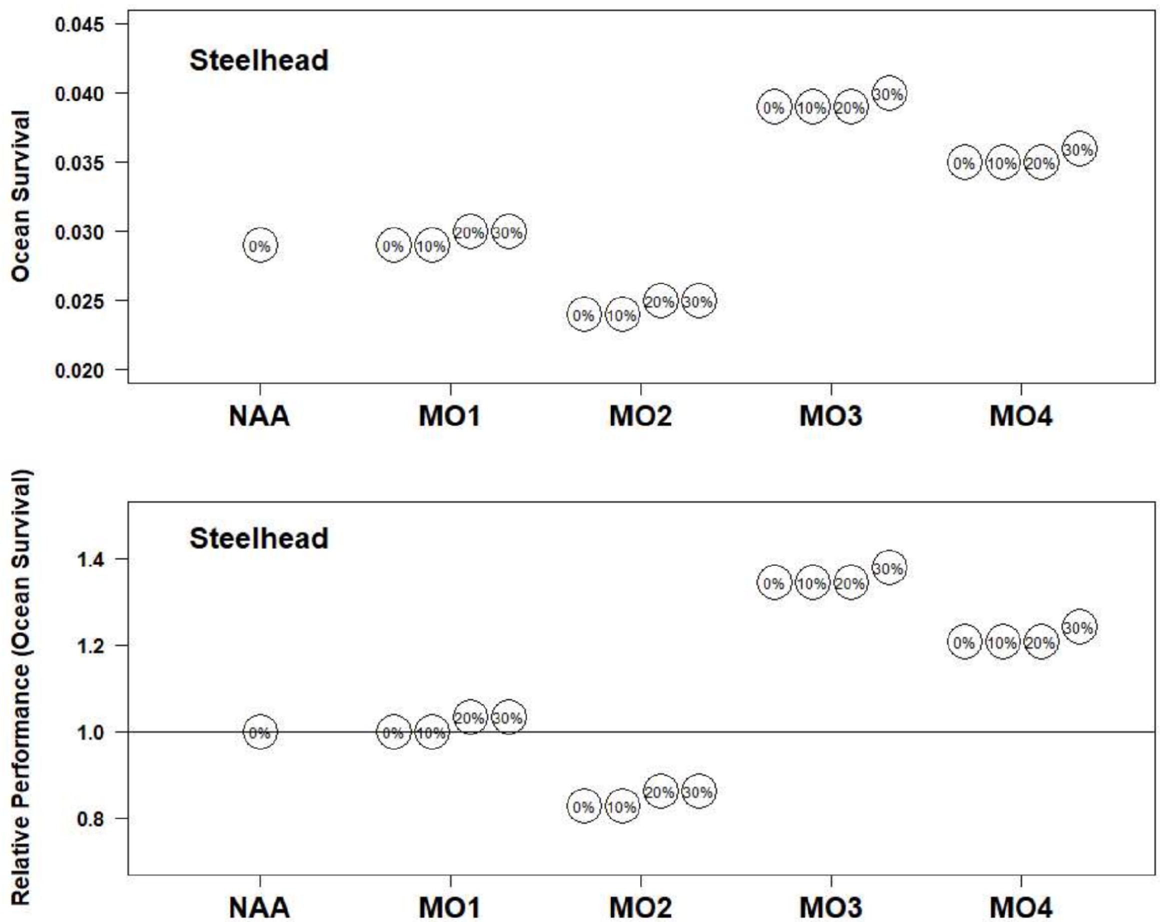

Figure 13. Steelhead ocean survival and relative performance using the cohort-specific model.

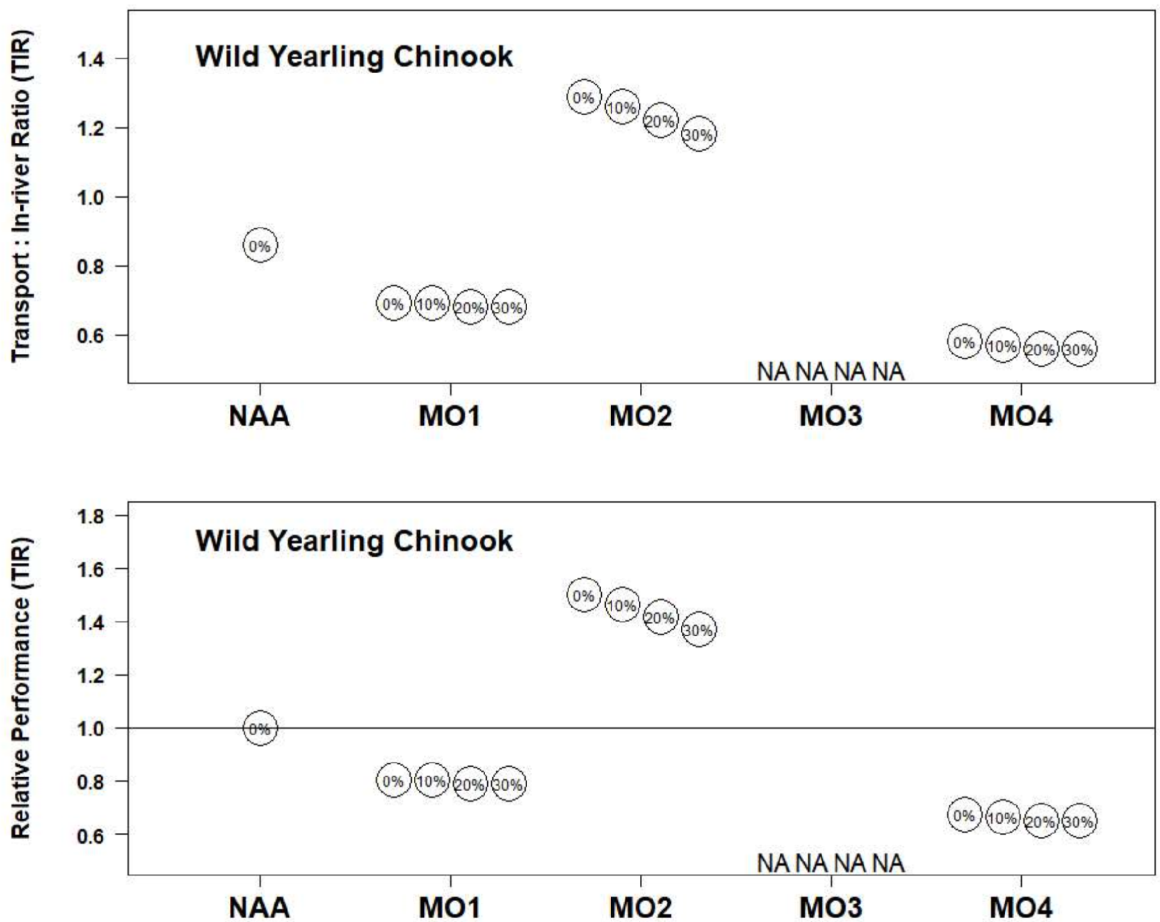

Figure 14. Yearling Chinook TIRs and relative performance.

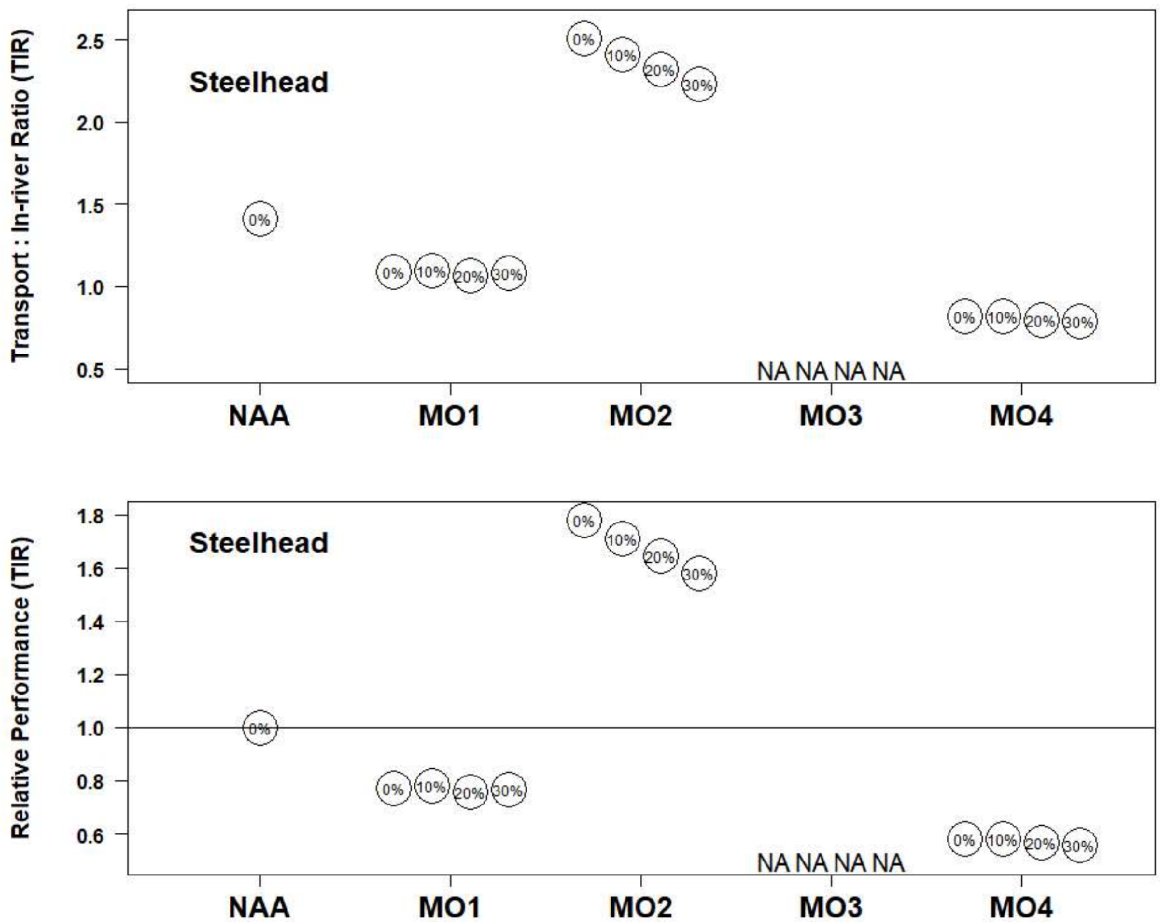

Figure 15. Steelhead TIRs and relative performance.

Tables

Table 2. Performance of SARs relative to BiOp in Non-Breach Scenarios using Life-Cycle Model. Values greater than 1 indicate the relative increase over the BiOp.

	115/120%			120%			125%		
Population	High	Avg	Low	High	Avg	Low	High	Avg	Low
CC	1.14	1.22	1.27	1.20	1.29	1.29	1.52	1.73	1.44
GR	1.14	1.22	1.26	1.20	1.30	1.27	1.50	1.73	1.42
IMN	1.14	1.22	1.27	1.20	1.30	1.28	1.50	1.73	1.43
LOS	1.14	1.23	1.28	1.21	1.30	1.29	1.51	1.74	1.44
MIN	1.15	1.22	1.27	1.21	1.30	1.29	1.52	1.74	1.44
WEN	1.14	1.22	1.28	1.20	1.30	1.29	1.51	1.73	1.44

Table 3. Performance of SARs relative to BiOp in Breach Scenarios using Life-Cycle Model. Values greater than 1 indicate the relative increase over the BiOp.

	115/120%			120%			125%		
Population	High	Avg	Low	High	Avg	Low	High	Avg	Low
CC	1.05	1.09	1.11	1.04	1.08	1.11	1.18	1.32	1.23
GR	1.05	1.09	1.11	1.04	1.08	1.11	1.18	1.32	1.22
IMN	1.05	1.10	1.12	1.04	1.09	1.11	1.18	1.32	1.23
LOS	1.05	1.09	1.12	1.05	1.08	1.11	1.19	1.33	1.23
MIN	1.05	1.09	1.11	1.04	1.08	1.11	1.18	1.31	1.22
WEN	1.05	1.10	1.11	1.04	1.09	1.10	1.18	1.32	1.22

Table 4. Abundances relative to BiOp in Non-Breach Scenarios using Life-Cycle Model. Values greater than 1 indicate the relative increase over the BiOp.

	115/120%			120%			125%		
Population	High	Avg	Low	High	Avg	Low	High	Avg	Low
CC	1.15	1.36	1.43	1.23	1.49	1.46	1.73	2.27	1.70
GR	1.37	1.48	1.55	1.48	1.66	1.59	2.26	2.78	1.88
IMN	1.20	1.30	1.37	1.28	1.41	1.39	1.71	2.02	1.59
LOS	1.22	1.33	1.39	1.32	1.45	1.42	1.80	2.15	1.64
MIN	1.20	1.31	1.37	1.28	1.41	1.39	1.71	2.05	1.60
WEN	1.30	1.47	1.58	1.43	1.65	1.61	2.16	2.78	1.96

Table 5. Abundances relative to BiOp in Breach Scenarios using Life-Cycle Model. Values greater than 1 indicate the relative increase over the BiOp.

	115/120%			120%			125%		
Population	High	Avg	Low	High	Avg	Low	High	Avg	Low
CC	1.02	1.13	1.15	1.01	1.12	1.15	1.19	1.45	1.31
GR	1.08	1.15	1.17	1.07	1.13	1.16	1.28	1.50	1.33
IMN	1.06	1.11	1.13	1.05	1.10	1.13	1.22	1.39	1.27
LOS	1.06	1.12	1.15	1.06	1.11	1.14	1.24	1.42	1.29
MIN	1.06	1.11	1.13	1.05	1.10	1.13	1.22	1.38	1.27
WEN	1.07	1.13	1.17	1.06	1.12	1.17	1.27	1.49	1.35

Table 6. Performance of SARs relative to the NAA, with no surface passage (0%), 10%, 20%, and 30% surface passage efficiencies using Life-Cycle Model. Values greater than 1 indicate the relative increase over the NAA.

	MO1				MO2				MO3				MO4			
Population	**0%**	**10%**	**20%**	**30%**	**0%**	**10%**	**20%**	**30%**	**0%**	**10%**	**20%**	**30%**	**0%**	**10%**	**20%**	**30%**
CC	1.01	1.02	1.03	1.03	0.64	0.66	0.68	0.70	1.77	1.78	1.79	1.80	1.59	1.60	1.61	1.62
GR	1.01	1.02	1.02	1.03	0.64	0.66	0.68	0.70	1.77	1.78	1.79	1.80	1.57	1.58	1.60	1.61
IMN	1.01	1.02	1.03	1.03	0.64	0.66	0.68	0.70	1.79	1.80	1.81	1.81	1.58	1.59	1.61	1.62
LOS	1.01	1.02	1.02	1.03	0.64	0.65	0.67	0.69	1.77	1.78	1.79	1.79	1.57	1.59	1.60	1.62
MIN	1.01	1.01	1.02	1.03	0.64	0.65	0.67	0.69	1.79	1.80	1.81	1.82	1.59	1.60	1.61	1.63
WEN	1.01	1.01	1.02	1.03	0.64	0.66	0.67	0.69	1.78	1.79	1.79	1.80	1.57	1.59	1.60	1.61

Table 7. Abundances relative to the NAA, with no surface passage (0%), 10%, 20%, and 30% surface passage efficiencies using Life-Cycle Model. Values greater than 1 indicate the relative increase over the NAA.

	MO1				MO2				MO3				MO4			
Population	**0%**	**10%**	**20%**	**30%**	**0%**	**10%**	**20%**	**30%**	**0%**	**10%**	**20%**	**30%**	**0%**	**10%**	**20%**	**30%**
CC	1.02	1.03	1.05	1.06	0.45	0.47	0.53	0.55	2.37	2.38	2.42	2.42	1.94	1.97	2.00	2.03
GR	1.03	1.08	1.11	1.12	0.35	0.38	0.46	0.50	2.87	2.88	2.97	2.97	2.33	2.37	2.43	2.46
IMN	1.01	1.01	1.03	1.04	0.55	0.57	0.60	0.62	2.08	2.09	2.09	2.10	1.78	1.80	1.82	1.84
LOS	1.03	1.03	1.05	1.06	0.50	0.53	0.56	0.59	2.22	2.23	2.23	2.24	1.87	1.90	1.92	1.94
MIN	1.02	1.03	1.04	1.05	0.55	0.57	0.59	0.62	2.09	2.10	2.11	2.12	1.80	1.82	1.84	1.87
WEN	1.01	1.03	1.04	1.06	0.37	0.39	0.42	0.45	2.72	2.74	2.76	2.77	2.23	2.26	2.30	2.34

Table 8. Predicted SARs in Non-Breach Scenarios using Life-Cycle Model.

	BiOp			115/120%			120%			125%		
Population	**High**	**Avg**	**Low**	**High**	**Avg**	**Low**	**High**	**Avg**	**Low**	**High**	**Avg**	**Low**
CC	0.025	0.024	0.026	0.029	0.029	0.033	0.030	0.031	0.033	0.038	0.041	0.037
GR	0.026	0.024	0.026	0.029	0.029	0.033	0.031	0.031	0.033	0.038	0.042	0.037
IMN	0.026	0.024	0.026	0.029	0.029	0.033	0.031	0.031	0.033	0.038	0.041	0.037
LOS	0.026	0.024	0.026	0.029	0.029	0.033	0.031	0.031	0.034	0.039	0.042	0.037
MIN	0.025	0.024	0.026	0.029	0.029	0.033	0.031	0.031	0.033	0.039	0.042	0.037
WEN	0.025	0.024	0.026	0.029	0.029	0.033	0.031	0.031	0.033	0.038	0.041	0.037

Table 9. Predicted SARs in Breach Scenarios using Life-Cycle Model.

	BiOp			115/120%			120%			125%		
Population	**High**	**Avg**	**Low**	**High**	**Avg**	**Low**	**High**	**Avg**	**Low**	**High**	**Avg**	**Low**
CC	0.049	0.047	0.048	0.052	0.051	0.053	0.052	0.051	0.053	0.058	0.062	0.058
GR	0.049	0.047	0.047	0.052	0.051	0.053	0.051	0.051	0.053	0.058	0.062	0.058
IMN	0.049	0.047	0.047	0.052	0.051	0.053	0.051	0.051	0.053	0.058	0.062	0.058
LOS	0.049	0.047	0.047	0.052	0.051	0.053	0.052	0.051	0.053	0.058	0.062	0.058
MIN	0.050	0.047	0.048	0.052	0.052	0.053	0.052	0.051	0.053	0.059	0.062	0.058
WEN	0.049	0.047	0.048	0.052	0.052	0.053	0.052	0.051	0.053	0.058	0.062	0.058

Table 10. Predicted abundances in Non-Breach Scenarios using Life-Cycle Model.

	BiOp			115/120%			120%			125%		
Population	**High**	**Avg**	**Low**	**High**	**Avg**	**Low**	**High**	**Avg**	**Low**	**High**	**Avg**	**Low**
CC	224	189	215	257	258	309	275	282	313	388	430	366
GR	223	206	249	305	305	386	329	340	394	503	572	467
IMN	2290	2127	2365	2738	2755	3237	2924	2994	3292	3916	4304	3764
LOS	662	613	692	810	818	963	871	890	980	1194	1317	1136
MIN	1024	949	1056	1225	1239	1450	1309	1340	1473	1752	1943	1691
WEN	1014	899	1052	1323	1323	1659	1447	1484	1697	2190	2497	2058

Table 11. Predicted abundances in Breach Scenarios using Life-Cycle Model.

	BiOp			115/120%			120%			125%		
Population	**High**	**Avg**	**Low**	**High**	**Avg**	**Low**	**High**	**Avg**	**Low**	**High**	**Avg**	**Low**
CC	505	451	457	515	510	528	510	504	526	601	653	600
GR	649	606	617	702	694	722	696	686	717	833	911	821
IMN	4631	4376	4417	4902	4861	5001	4876	4813	4977	5664	6075	5621
LOS	1442	1360	1367	1535	1523	1568	1525	1506	1560	1783	1929	1764
MIN	2103	1994	2002	2225	2210	2268	2213	2187	2259	2560	2760	2541
WEN	2865	2692	2726	3062	3051	3200	3046	3020	3180	3650	4002	3682

Table 12. Predicted SARs with no surface passage (0%), 10%, 20%, and 30% surface passage efficiencies using Life-Cycle Model.

	NAA	MO1				MO2				MO3				MO4			
Population	**0%**	**0%**	**10%**	**20%**	**30%**	**0%**	**10%**	**20%**	**30%**	**0%**	**10%**	**20%**	**30%**	**0%**	**10%**	**20%**	**30%**
CC	0.027	0.028	0.028	0.028	0.028	0.018	0.018	0.019	0.019	0.049	0.049	0.049	0.049	0.044	0.044	0.044	0.045
GR	0.028	0.028	0.028	0.028	0.028	0.018	0.018	0.019	0.019	0.049	0.049	0.050	0.050	0.043	0.044	0.044	0.045
IMN	0.028	0.028	0.028	0.028	0.028	0.018	0.018	0.019	0.019	0.049	0.050	0.050	0.050	0.044	0.044	0.044	0.045
LOS	0.028	0.028	0.028	0.028	0.029	0.018	0.018	0.019	0.019	0.049	0.050	0.050	0.050	0.044	0.044	0.045	0.045
MIN	0.028	0.028	0.028	0.028	0.028	0.018	0.018	0.019	0.019	0.049	0.050	0.050	0.050	0.044	0.044	0.045	0.045
WEN	0.028	0.028	0.028	0.028	0.028	0.018	0.018	0.019	0.019	0.049	0.049	0.050	0.050	0.044	0.044	0.044	0.045

Table 13. Predicted abundances with no surface passage (0%), 10%, 20%, and 30% surface passage efficiencies using Life-Cycle Model.

	NAA	MO1				MO2				MO3				MO4			
Population	**0%**	**0%**	**10%**	**20%**	**30%**	**0%**	**10%**	**20%**	**30%**	**0%**	**10%**	**20%**	**30%**	**0%**	**10%**	**20%**	**30%**
CC	232	237	239	244	246	103	109	122	128	548	551	560	561	450	456	464	470
GR	258	266	278	286	289	91	99	119	128	739	743	764	766	600	609	625	633
IMN	2549	2577	2587	2626	2649	1395	1446	1519	1573	5297	5315	5325	5351	4537	4591	4648	4696
LOS	742	763	764	780	787	374	391	417	436	1650	1656	1658	1665	1391	1409	1426	1442
MIN	1140	1162	1169	1184	1196	621	647	676	705	2385	2394	2403	2416	2054	2077	2102	2126
WEN	1193	1205	1226	1243	1261	442	469	504	538	3241	3265	3287	3306	2662	2701	2745	2792

Table 14. Predicted juvenile survival (LGR-BON) with no surface passage (0%), 10%, 20%, and 30% surface passage efficiencies using the cohort-specific model.

	NAA	MO1				MO2				MO3				MO4			
Species	0%	0%	10%	20%	30%	0%	10%	20%	30%	0%	10%	20%	30%	0%	10%	20%	30%
Yearling Chinook	0.576	0.579	0.580	0.582	0.583	0.520	0.526	0.531	0.537	0.680	0.681	0.682	0.682	0.632	0.633	0.634	0.635
Steelhead	0.571	0.578	0.581	0.585	0.588	0.394	0.411	0.427	0.444	0.829	0.830	0.830	0.831	0.729	0.732	0.734	0.737

Table 15. Predicted juvenile fish travel times (LGR-BON) with no surface passage (0%), 10%, 20%, and 30% surface passage efficiencies using the cohort-specific model.

	NAA	MO1				MO2				MO3				MO4			
Species	0%	0%	10%	20%	30%	0%	10%	20%	30%	0%	10%	20%	30%	0%	10%	20%	30%
Yearling Chinook	15.8	15.7	15.6	15.5	15.5	18.3	18.0	17.8	17.5	12.5	12.5	12.5	12.4	13.7	13.7	13.7	13.6
Steelhead	16.2	16.3	16.3	16.2	16.2	17.6	17.5	17.4	17.2	11.0	11.0	11.0	11.0	14.7	14.7	14.6	14.6

Table 16. Predicted ocean survival rates with no surface passage (0%), 10%, 20%, and 30% surface passage efficiencies using the cohort-specific model.

	NAA	MO1				MO2				MO3				MO4			
Species	0%	0%	10%	20%	30%	0%	10%	20%	30%	0%	10%	20%	30%	0%	10%	20%	30%
Yearling Chinook	0.036	0.038	0.039	0.039	0.039	0.025	0.026	0.027	0.028	0.059	0.059	0.059	0.060	0.055	0.056	0.056	0.057
Steelhead	0.029	0.029	0.029	0.030	0.030	0.024	0.024	0.025	0.025	0.039	0.039	0.039	0.040	0.035	0.035	0.035	0.036

Table 17. Predicted SARs with no surface passage (0%), 10%, 20%, and 30% surface passage efficiencies using the cohort-specific model.

	NAA	MO1				MO2				MO3				MO4			
Species	0%	0%	10%	20%	30%	0%	10%	20%	30%	0%	10%	20%	30%	0%	10%	20%	30%
Yearling Chinook	0.020	0.021	0.021	0.021	0.022	0.012	0.013	0.014	0.014	0.042	0.042	0.043	0.043	0.034	0.034	0.035	0.035
Steelhead	0.018	0.018	0.019	0.019	0.019	0.012	0.012	0.013	0.013	0.050	0.050	0.050	0.050	0.030	0.031	0.031	0.031

Table 18. Predicted Transport:In-river Ratios (TIRs) with no surface passage (0%), 10%, 20%, and 30% surface passage efficiencies. No transportation would occur under MO3.

	NAA	MO1				MO2				MO3				MO4			
Species	**0%**	**0%**	**10%**	**20%**	**30%**	**0%**	**10%**	**20%**	**30%**	**0%**	**10%**	**20%**	**30%**	**0%**	**10%**	**20%**	**30%**
Wild Yearling Chinook	0.86	0.69	0.69	0.68	0.68	1.29	1.26	1.22	1.18	NA	NA	NA	NA	0.58	0.57	0.56	0.56
Steelhead	1.41	1.09	1.10	1.07	1.08	2.51	2.41	2.32	2.23	NA	NA	NA	NA	0.82	0.82	0.80	0.79

From: Doumbia,Julie A (BPA) - EC-5

Sent: Wed Jul 03 08:45:12 2019

To: Daniel Widener - NOAA Affiliate; James Faulkner - NOAA Federal; Michele Dehart; Rich Zabel - NOAA Federal

Cc: Chuck Chamberlain (NWW); Sue Camp (scamp@usbr.gov); Petersen,Christine H (BPA) - EWP-4; Hauser,Tracy L (BPA) - EWL-4

Subject: REVIEW REQUESTED BY JULY 12: SR Steelhead modeling

Importance: Normal

Attachments: Main_EIS_CH3_Fish_MO1-4_SR_Steelhead_Modeling_COMPASS_LCM_CSS.docx

Hello Fish Modelers,

[redacted] (b) (5)

(b) (5)

[redacted]

Thank you all again,

Julie

From: Doumbia,Julie A (BPA) - EC-5
Sent: Friday, June 28, 2019 11:53 AM
To: 'Daniel Widener - NOAA Affiliate'; 'James Faulkner - NOAA Federal'; 'Michele Dehart'; 'Rich Zabel - NOAA Federal'
Cc: Chuck Chamberlain (NWW); Sue Camp (scamp@usbr.gov); Petersen,Christine H (BPA) - EWP-4; Hauser,Tracy L (BPA) - EWL-4
Subject: REMINDER: REVIEW REQUESTED BY JUNE 28: SR Sp/Su Chinook modeling

Hello Fish Modelers,

Just a quick reminder that edits to the SR Sp/Su Chinook draft are due back today so that this draft can be updated over the weekend and go to the fish technical team on Monday, June 1.

(b) (5) [redacted]

Thank you all again!

Julie

From: Doumbia,Julie A (BPA) - EC-5
Sent: Monday, June 24, 2019 8:38 AM
To: Daniel Widener - NOAA Affiliate; James Faulkner - NOAA Federal; Michele Dehart; Rich Zabel - NOAA Federal
Cc: Chuck Chamberlain (NWW); Sue Camp (scamp@usbr.gov); Petersen,Christine H (BPA) - EWP-4; Hauser,Tracy L (BPA) - EWL-4
Subject: REVIEW REQUESTED BY JUNE 28: SR Sp/Su Chinook modeling

Hello Fish Modelers,

[redacted] (b) (5)

(b) (5)

[redacted]

(b) (5)

[redacted]

Julie

Julie Doumbia

Environmental Protection Specialist

Bonneville Power Administration
bpa.gov | P 503-230-7641 | C [redacted]

CHAPTER 3 - ENVIRONMENTAL CONSEQUENCES

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(b) (5)

[redacted]

(b) (5) [redacted]

3.4.9 References

From: Michele Dehart

Sent: Fri Dec 13 09:27:44 2019

To: Chamberlain, Charles B CIV USARMY CENWW (USA); Daniel Widener - NOAA Affiliate; rich.zabel@noaa.gov; jim.faulkner@noaa.gov

Cc: Susan Camp BOR; Donahue,Scott L (BPA) - EWP-4

Subject: [EXTERNAL] RE: CRSO Modeling - Preferred Alternative

Importance: Normal

Chuck:

[redacted] (b) (5)

Michele

-----Original Message-----
From: Chamberlain, Charles B CIV USARMY CENWW (USA) [mailto:Charles.B.Chamberlain@usace.army.mil]
Sent: Thursday, December 12, 2019 11:21 AM
To: Michele Dehart <mdehart@fpc.org>; Daniel Widener - NOAA Affiliate <daniel.widener@noaa.gov>; rich.zabel@noaa.gov; jim.faulkner@noaa.gov
Cc: Susan Camp BOR <scamp@usbr.gov>; Donahue,Scott L (BPA) - EWP-4 <sldonahue@bpa.gov>
Subject: CRSO Modeling - Preferred Alternative

Modeling Team,

[redacted] (b) (5)

Charles Chamberlain
Biologist
US Army Corps of Engineers
Walla Walla District
201 North 3rd Avenue
Walla Walla, WA 99362
509-527-7298

From: Michele Dehart

Sent: Fri Dec 20 09:57:19 2019

To: Chamberlain, Charles B CIV USARMY CENWW (USA); Susan Camp BOR; Tackley, Kathryn L CIV USARMY CENWP (USA); jcsweet@bpa.gov

Cc: Tucker Jones; Jay Hesse; Ed Bowles; 'Dan Rawding (daniel.rawding@dfw.wa.gov)'; Hebdon,Lance; Ebel,Jonathan; 'Tim Copeland (tim.copeland@idfg.idaho.gov)'; Steve_Haeseker@fws.gov; adam.j.storch@state.or.us; 'Bob Lessard'; Jerry McCann; Brandon Chockley; Gabriel Scheer; Erin Cooper

Subject: [EXTERNAL] Data sets for preferred alternative

Importance: Normal

Chuck, Jason and Sue:

We received the new data sets for a new CRSO-EIS alternative late yesterday afternoon, December 19. When we analyzed the previous five CRSO-EIS alternatives we were also given a written description of the alternative. The written description was important to guide the modelling analyses. There is no description of the alternative to be analyzed included with the data set. A written description of the alternative is important to understand the details of the analyses that is being conducted. Without a written description of the alternative, to inform the modelling analyses, it will be difficult to analyze the data sets so that they reflect whatever the details of the proposed operation are going to be.

Please provide a written description of the operation alternative as was done for the previous operations alternatives analyzed in the CRSO-EIS.

Michele DeHart, Manager

The Fish Passage Center

From: Michele Dehart

Sent: Thu Feb 13 17:04:08 2020

To: Hauser,Tracy L (BPA) - EWL-4

Subject: [EXTERNAL] RE: EIS CSS model presentation

Importance: Normal

Tracy;

Ok we will try. I am going to try to contact the CSS reps tomorrow.

Michele

From: Hauser,Tracy L (BPA) - EWL-4 [mailto:tlhauser@bpa.gov]
Sent: Thursday, February 13, 2020 5:00 PM
To: Michele Dehart <mdehart@fpc.org>
Cc: Jule,Kristen R (BPA) - EWP-4 <krjule@bpa.gov>
Subject: RE: EIS CSS model presentation

Hi Michele

For now focus on Chapter 2 and let's see what Kristen reports back. I'm sure someone will be in touch with you and could probably provide you more details – I get the impression this is not a huge ask. ~ T

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Tracy L. Hauser, F&W Project Mgr cid:image001.png@01D3C808.E543B670

From: Michele Dehart <mdehart@fpc.org>
Sent: Thursday, February 13, 2020 4:40 PM
To: Hauser,Tracy L (BPA) - EWL-4 <tlhauser@bpa.gov>
Subject: [EXTERNAL] RE: EIS CSS model presentation

Tracy:

As I say no one contacted me about this, so I am a bit surprised. The pressure is really on for us to get that chapter 2 done.

Michele

From: Hauser,Tracy L (BPA) - EWL-4 [mailto:tlhauser@bpa.gov]
Sent: Thursday, February 13, 2020 4:37 PM
To: Michele Dehart <mdehart@fpc.org>
Cc: 'Bob Lessard' <lessard@critfc.org>; Steve_Haeseker@fws.gov; Adam J Storch <Adam.J.Storch@state.or.us>; 'Dan Rawding (daniel.rawding@dfw.wa.gov)' <daniel.rawding@dfw.wa.gov>; 'Tim Copeland (tim.copeland@idfg.idaho.gov)' <tim.copeland@idfg.idaho.gov>; Tucker Jones <Tucker.A.Jones@state.or.us>; Rob Lothrop (lotr@critfc.org) <lotr@critfc.org>; Jule,Kristen R (BPA) - EWP-4 <krjule@bpa.gov>
Subject: RE: EIS CSS model presentation

Michele the Corps has contracted with Battelle to lead the review. I have shared this with Kristen Jule so she can follow up with the right folks on your concerns below. ~ Tracy

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Tracy L. Hauser, F&W Project Mgr cid:image001.png@01D3C808.E543B670

From: Michele Dehart <mdehart@fpc.org>
Sent: Thursday, February 13, 2020 4:02 PM
To: Hauser,Tracy L (BPA) - EWL-4 <tlhauser@bpa.gov>
Cc: 'Bob Lessard' <lessard@critfc.org>; Steve_Haeseker@fws.gov; Adam J Storch <Adam.J.Storch@state.or.us>; 'Dan Rawding (daniel.rawding@dfw.wa.gov)' <daniel.rawding@dfw.wa.gov>; 'Tim Copeland (tim.copeland@idfg.idaho.gov)' <tim.copeland@idfg.idaho.gov>; Tucker Jones <Tucker.A.Jones@state.or.us>; Rob Lothrop (lotr@critfc.org) <lotr@critfc.org>
Subject: [EXTERNAL] RE: EIS CSS model presentation

Tracy:

I have not been contacted by the Corps. On August 15, 2019 we provided all of the models code, and coefficients and documentation for the cohort model to Chuck Chamberlain at the COE as they requested. We have provided all of the documents explaining the models. They have had a significant amount of time and they have everything they need, including years of CSS Annual Reports and ISAB reviews, to conduct a review. If after reviewing the considerable amount of documentation provided to them regarding the COE models, the reviewers have specific questions, I strongly suggest they provide those questions to us in writing and we will respond in writing. I suggest that it would be most efficient to coordinate the COE model peer review with the already planned ISAB and public review of these analyses.

The March 3 through 10 time frame is not workable for the CSS Oversight Committee. From now through March 9, the top work priority focus for the CSS Oversight Committee is completion of Chapter 2, of the CSS Annual Report. You recall that this chapter is due to be released on or around February 28, 2020. The topic of Chapter 2 is the CSS model analyses, including documentation of methods and results. of the CRSO alternatives including documentation of methods and results . This Chapter will be reviewed by the Independent Scientific Advisory Board of the Northwest Power and Conservation Council as well as the public at large. We will respond to all written comments. I suggest that it would be most efficient to complete chapter 2, then the Corps peer reviewers can review that chapter and provide written comments and questions in writing.

Please let me know who comprises the COE peer review panel.

Michele Dehart, Manager

The Fish Passage Center

From: Hauser,Tracy L (BPA) - EWL-4 [mailto:tlhauser@bpa.gov]
Sent: Thursday, February 13, 2020 3:30 PM
To: Michele Dehart <mdehart@fpc.org>
Subject: EIS CSS model presentation

Hi Michele

I wanted to reach out to you and let you know that the Corps is doing an independent peer review of the CRO/EIS models and you will be contacted to present on March 3, 2020 between 12-3 a brief overview (10-15 minutes) of your CSS model. If you have existing presentation material, you can use that and you can do it over phone and WebEx so no need to travel unless you want to do it in person. Then if needed, they may have additional follow up questions sometime in April/May that you can respond via phone or email. ~ Tracy

If you have questions you can contact the following staff:

Leah Hauenstein, Leah.J.HAUENSTEIN@usace.army.mil

Desk: 206-316-3169

Rachel Mesko Rachel.C.Mesko@usace.army.mil

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Tracy L. Hauser, F&W Project Mgr cid:image001.png@01D3C808.E543B670

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Fish & Wildlife, Oregon Implementation

P.O. Box 3621 - EWL-4

Portland, OR 97208-3621

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[redacted] *cell*

503-230-4564 fax

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P Please consider the **environment** before printing this e-mail

cid:image004.png@01D1600B.54563E60

From: Hauser,Tracy L (BPA) - EWL-4

Sent: Fri Apr 05 12:14:15 2019

To: Michele Dehart

Subject: RE: FPC workstatement 2018.

Importance: Normal

Michele

It was winter 2017, during the renewal we added the WE F to the 18 renewal. So it would have been effective 12/1/2017 – 11/30/2018 and then again in 2019 same WE F CRSO/EIS Modeling Support. ~ Tracy

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Tracy L. Hauser, F&W Project Mgr cid:image001.png@01D3C808.E543B670

From: Michele Dehart <mdehart@fpc.org>
Sent: Friday, April 5, 2019 11:28 AM
To: Hauser,Tracy L (BPA) - EWL-4 <tlhauser@bpa.gov>
Subject: [EXTERNAL] FPC workstatement 2018.

Hello Tracy:

I have a question. Could you tell me the date in 2018 that the FPC work statement was modified to include a WE modification for technical support to the federal action agencies on analyzing the CRSO EIS alternatives. I think it was in March 2018, I am going through our records and will eventually find it, but I thought you might be able to tell me. All of that was followed by discussions of the non-disclosure agreement.

Michele

From: Michele Dehart

Sent: Fri Jul 12 15:51:40 2019

To: Julie Doumbia (jadoumbia@bpa.gov)

Subject: [EXTERNAL] FW: please final

Importance: Normal

Attachments: CRSO-47.pdf

Hello Julie:

Attached are our comments on the Draft Chapter 3, Upper Columbia spring chinook and steelhead of the CRSO EIS. The CSS Upper Columbia life cycle model has completed retrospective analyses but has not done prospective analyses at this point. However, there are several CSS analyses and CSS data that address the Upper Columbia that I believe would be beneficial to include in the EIS.

Call if you have questions.

Michele

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http://www.fpc.org/
e-mail us at fpcstaff@fpc.org

MEMORANDUM

TO: Julie Doumbia, BPA

(b) (6) [redacted]

FROM: Michele DeHart

DATE: July 12, 2019

RE: Review of Draft CRSO Chapter 3 – Environmental Consequences, 3.4.3.1 - 3.4.3.2 Modeling – 3.4.5.1.1.1.1.1- 3.4.5.1.1.1.1.1 Upper Columbia Spring Chinook Evolutionary Significant Unit (ESU)

In response to your request, the Fish Passage Center (FPC) staff and the Comparative Survival Study (CSS) Oversight Committee reviewed the draft section of Chapter 3, which you provided by email on July 2, 2019. This is a partial and rough draft of Chapter 3 (Draft), which only includes results for Upper Columbia Spring Chinook. We have developed these comments according to your instructions (attached), and only comment and review the components that the FPC/CSS have developed. We do have comments on the other components of this draft but will reserve them for submittal at a later time as per your instructions. As noted in responses to questions from the federal agencies on June 14, 2019, the FPC/CSS will not provide model results for Upper Columbia River stocks of salmon and steelhead. However, the CSS Annual Report for 2018 includes preliminary modelling results for Upper Columbia spring chinook which should be reflected in the EIS, and will illuminate the consideration of federal alternatives being considered in the CRSO EIS and the anticipated impact of those alternatives on Upper Columbia populations of spring chinook. In addition, analyses that have been presented to the region illuminate the effects of hydrosystem operations on Upper Columbia steelhead to the degree that the federal CRSO alternatives affect spill and flow

CSS Life cycle model analyses addressing the Upper Columbia
The 2018 CSS Annual Report, Chapter 2, includes the development of a life-cycle model for Wenatchee River and Methow River spring chinook. This CSS life-cycle analyses is a retrospective analyses of Upper Columbia spring chinook and is in the early stages of development. The development of the Upper Columbia Spring Chinook life cycle model provides a foundation upon which to pursue investigation into stage-specific questions relating to the life cycle survival and abundance trends of salmon populations. The results presented in the 2018 CSS Annual Report illustrate how survival and long-term return abundance may respond to changes in hydrosystem operations and environmental conditions. Empirical estimates of demographic rates are consistent with the findings for the Snake River populations that SARs have improved since hydrosystem operations have been modified to reduced powerhouse passage. This preliminary analyses detected a negative effect of both Upper and Lower Columbia powerhouse passage, but note that the Upper Columbia passage index was based purely on spill volumes, and does not account for structural changes to the projects that may affect the efficiency of spill. We also detected a negative effect of PDO and a positive effect of upwelling effect on ocean survival. The results are preliminary in the sense that we have yet to integrate populations into a single assessment, nor has the analysis accounted for prior information relevant to tributary dynamics and ocean dynamics. That said, the model effectively accounts for prediction and measurement uncertainties, which represents a significant step forward in reconciling life stage predictions with data deficiencies. The CSS has a stated objective of providing meaningful insights and comparative analyses to aid in the assessment of population trends and recovery potential for Columbia basin salmon populations.

Overall SARs for Upper Columbia populations calculated in the CSS study are available to the public on the FPC website. PIT-tag SARs for Upper Columbia hatchery spring Chinook (Leavenworth) are consistently highly correlated with wild and hatchery spring/summer and spring Chinook stocks from both the Snake River and Mid-Columbia regions. This has been a consistent finding and indicates that Upper Columbia populations and Snake River populations of spring chinook have similar responses to shared experiences, in the lower Columbia River and the estuary ocean. These findings indicate that Upper Columbia spring Chinook can be expected to respond to spill and flow levels and ocean conditions in a similar manner to their Snake River counterparts.

Regional Analyses that include Upper Columbia Steelhead

A model and set of prospective simulation analyses was presented at the 2018 Pacific Coast Steelhead Management Meeting titled, Factors Associated with the Regional Patterns of Steelhead Survival in the Columbia River Basin (Haeseker et al. 2018). This analysis considered wild steelhead populations from the Snake, Entiat-Methow (Upper Columbia), John Day and Yakima rivers. Although these populations have different locations of origin they share a migration corridor through the middle Columbia River, along with shared estuary and ocean conditions. The model included the powerhouse passage index (PITPH), water transit time, and ocean conditions. The model analyses compared two operational scenarios, (1.) the Biological Opinion, which would correspond to the No Action Alternative in the CRSO EIS, and (2.) spill to the 125% tailrace gas cap, which would correspond to the MO4 Alternative in the CRSO EIS. This analysis should be considered in the CRSO EIS because it indicates, consistent with previous CSS analyses, that Upper Columbia steelhead populations have similar responses to fresh water migration conditions (powerhouse passage experiences and flow) and marine conditions as their Snake River counterparts. The analysis indicated that SARs of wild steelhead from the Entiat and Methow rivers would increase by 28% under a 125% TDG spill operation at the lower Columbia River dams (McNary, John Day, The Dalles, and Bonneville) compared to the Biological Opinion spill levels. These improvements in SARs from this analysis are an indication of the improvements that would be expected under the MO4 Alternative compared to the NAA Alternative and should be considered in the CRSO EIS.

Reference

Haeseker, S., J. McCann, B. Chockley, and D. Benner. 2018. Factors Associated with the Regional Patterns of Steelhead Survival in the Columbia River Basin. Oral presentation at the 2018 Pacific Coast Steelhead Management Meeting, March 20-22, 2018, Walla Walla, Washington. Available at:
https://www.psmfc.org/steelhead/2018/Haeseker_regional_patterns_in_steelhead_survival.pdf

From: Doumbia,Julie A (BPA) - EC-5

Sent: Tue Sep 17 20:07:31 2019

To: Daniel Widener - NOAA Affiliate; James J Anderson (jjand@uw.edu); James Faulkner - NOAA Federal; Michele Dehart; nickbeer@uw.edu; Rich Zabel - NOAA Federal

Cc: Chuck Chamberlain (NWW); Sue Camp (scamp@usbr.gov); Petersen,Christine H (BPA) - EWP-4; Hauser,Tracy L (BPA) - EWL-4; Goodman, Dave

Subject: 9/17 CRSO Fish Modelers Update

Importance: Normal

Attachments: CRSO Fish and Wildlife Master Contact List v.Sept2019.xlsx

Hello CRSO Fish Modelers,

Thank you very much to everyone for sticking to completion timelines to the extent feasible and for responding quickly to follow-up questions we've had about your modeling for the Chapter 3 (effects analysis) documentation over the past couple of months. We anticipate the Chapter 3 draft will be distributed for federal agency and cooperating agency review in October 2019 (next month) and we may have additional follow-up questions for your groups after this review.

(b) (5)
(b) (5) [redacted]. I will be transitioning

into a new position starting September 30th and it is unclear at this time whether a BPA replacement will be added for the CRSO fish team. I want you all to know I have appreciated the support and knowledge you have shared with me during this project - I've learned a lot more about your models from your questions and clarifications, and I truly appreciate your dedication to getting the results captured correctly in this EIS – I know Sue and Chuck also share this sentiment. It has truly been an honor to work with such dedicated people and I will miss working with you all!

Lastly, a quick reminder that if you receive medium-large information requests, questions, etc related to CRSO topics from individual cooperating agency members (see list attached), or groups of cooperating agency members, before the release of the draft CRSO EIS in February 2020: if the request has not been coordinated with the co-lead agencies (Corps, Reclamation, BPA) or if you're unsure if it has been coordinated with the co-lead agencies, and your work responding to the request would be all, or in part, funded by your BPA project, please check-in with the co-lead agencies first before spending time on the request. Please feel free to ask the cooperating agency if their request has been coordinated with the co-lead agencies as well. If the request is just a simple/quick clarification about your model, that's fine to answer their question directly. The intent is not to limit their questions, but rather to better coordinate the competing requests it seems we and they have for your time at times.

Thank you!

Julie

Julie Doumbia

Environmental Protection Specialist

Bonneville Power Administration
bpa.gov | P 503-230-7641 | C [redacted]

Transition Advisory: My last day working on CRSO will be September 27th. After this date, I will be transitioning to BPA's Energy Efficiency team and CRSO fish communications should be directed to Chuck Chamberlain and Sue Camp.

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From: Michele Dehart

Sent: Mon Mar 09 13:27:39 2020

To: Hauser,Tracy L (BPA) - EWL-4

Subject: [EXTERNAL] RE: Chapter 2

Importance: Normal

Attachments: CRSO-78.pdf

Tracy:

The January 24, 2020 memorandum went only to the action agencies. This is our CSS analyses of the PA, as we were requested to do. I assume that the federal action agencies provided the January 24, 2020 memorandum to the CRSO Fish Technical Team. I asked Chuck Chamberlain to do so. I assume that he did because I received a few questions from fish technical team members from state agencies indicating that they needed some clarification of the quartile ranges reported in the January 24, 2020 memorandum to the federal agencies (ie are these statistical confidence intervals)? We addressed these questions in the Chapter 2 report to the ISAB, which reported the same quartile range data in terms of probability, to clarify the questions we had received. The numbers are the numbers, it is the same data set from the January 24, 2020 memorandum to the federal agencies, presented in a simpler manner that was easier to understand.

In accord with the non-disclosure agreement, when the DEIS was released to the region for public review, on February 28, 2020, we sent the CSS Chapter 2 analyses to the ISAB and we posted the document on the FPC website as well as other CRSO documents.

In mid- February I received a request from the Pacific Fishery Management Council to present the CSS analyses of the EIS alternatives to the PFMC Habitat Committee. I told them we would not be able to discuss any analyses until after the DEIS was released. In addition advised that the FPC did not have adequate travel budget to travel to PFMC in California and suggested we could present the analyses to the Vancouver WA meeting in April. They wanted to have the presentation at their March 3, meeting in California. One of the CSS committee members, was already planning to be at the PFMC meeting, and he graciously agreed to present the Chapter 2 CSS analyses to the PFMC Habitat Committee. Therefore saving travel funds and time.

I became aware of the considerable uproar from the federal agencies from Crystal Ball, BPA and Rebecca Weise, USACOE following the meeting. I will forward you my response on these matters. Review of the PA and other alternatives shows that at the lower quartile ranges of the data, that is poor ocean conditions and poor flows, the predicted SARs are below the 1% population replacement level, this is directly from the January 24, 2020 . "**The lower end of the predicted SAR range for the PA was less than 1% for both species, which is below the minimum to avoid population decline."** •

memorandum to the federal agencies.

I am happy to respond to any questions you might have.

Michele

From: Alex Saint
Sent: Monday, March 9, 2020 12:53 PM
To: Michele Dehart <mdehart@fpc.org>
Subject: FW: Chapter 2

See below for Tracy's question regarding Chapter 2. I'm passing this to you and I don't want to give out incorrect information.

Alex Saint

Fish Passage Center

503-833-3901

He/Him

From: Hauser,Tracy L (BPA) - EWL-4 [mailto:tlhauser@bpa.gov]
Sent: Monday, March 9, 2020 12:48 PM
To: Alex Saint
Subject: RE: Chapter 2

Did FPC send this to the Federal Agencies on Jan. 24 or just the annual report minus Ch 2?

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Tracy L. Hauser, F&W Project Mgr cid:image001.png@01D3C808.E543B670

From: Alex Saint <alexsaint@fpc.org>
Sent: Monday, March 9, 2020 12:00 PM
To: Hauser,Tracy L (BPA) - EWL-4 <tlhauser@bpa.gov>
Subject: [EXTERNAL] RE: Chapter 2

Tracy,

Here is chapter 2, and I can upload it as well. It won’t be added to the CSS report until it has undergone ISAB review.

Alex Saint

Fish Passage Center

503-833-3901

He/Him

From: Hauser,Tracy L (BPA) - EWL-4 [mailto:tlhauser@bpa.gov]
Sent: Friday, March 6, 2020 2:16 PM
To: Alex Saint
Subject: Chapter 2

Alex

Have you uploaded chapter 2 of CSS in PISCES. I checked under contract 78040-21 and its missing w/a statement. If it's done, can you send me a copy – thank you. ~ T

><((((*>   ><((((*>   ><((((*>

Tracy L. Hauser, F&W Project Mgr cid:image001.png@01D3C808.E543B670

Bonneville Power Administration

Fish & Wildlife, Oregon Implementation

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MEMORANDUM

TO: Chuck Chamberlain, USACOE
Fish Technical Team

(b) (6) [redacted]

FROM: Michele DeHart, FPC

DATE: January 24, 2020

RE: Comparative Survival Study (CSS) Analysis of CRSO -EIS Operation Alternatives including the Federal Agencies Preferred Alternative

In response to requests from the Action Agencies, Bonneville Power Administration (BPA), the US Army Corps of Engineers and the Bureau of Land Management, the Comparative Survival Study Oversight Committee (CSSOC) and the Fish Passage Center (FPC) have completed analyses of the original five operations alternatives being considered in the Columbia River Systems Operations (CRSO) Environmental Impact Statement (EIS) and supplied those results to the Fish Technical Team in an April 29, 2019 memorandum (FPC 2019a).

On December 19, 2019 the federal agencies provided the 80-year water record dataset for the federal agencies Preferred Alternative Operation for the CRSO-EIS. On January 3, 2020 the federal agencies provided a brief written description of the federal agencies Preferred Alternative (PA). In order to facilitate better understanding of the operations alternatives, relative to each other, the recent preferred alternative is presented relative to the previously analyzed CRSO-EIS operations alternatives.

As previously agreed, the federal agencies CRSO EIS alternatives have been evaluated utilizing CSS methodologies and metrics. All CSS analytical methods are documented in CSS Annual Reports (McCann et al. 2017 and McCann et al. 2018) and in Documentation of Experimental Spill Management: Models, Hypotheses, Study Design, and response to ISAB (CSSOC 2017). These documents are available to the public at www.fpc.org.

As discussed in early conversations regarding the Action Agencies' request, the CSSOC and the FPC have utilized well-documented and regionally-reviewed CSS analytical methodologies, models, and metrics in analyzing the CRSO operations alternatives. A suite of models were utilized to analyze the CRSO operations alternatives. The CSS Life Cycle Model was applied to analyze expected Smolt-to-Adult Return rates (SARs) and adult spawning ground abundances for six tributary populations of Chinook salmon in the Grand Ronde Basin. CSS models were also applied to analyze expected juvenile survival, juvenile Fish Travel Time (FTT), ocean survival, SARs, and Transport:In-river Ratios (TIRs) for yearling Chinook salmon and steelhead from the Snake River Basin. The 80-year water record and predicted flow and spill datasets for each CRSO alternative, provided by federal the Action Agencies, were utilized in these analyses.

There are two primary objectives of these analyses. First, we analyze the relative performance in CSS metrics among the established CRSO alternatives and second, we compare results of the analyses of the CRSO alternatives based on the 80-year water record with CSS analyses presented to the CRSO Fish Technical Team in September 2017. In addition, our previous analyses of CRSO alternatives included three levels of assumed passage efficiencies for proposed Powerhouse Surface Passage (PSP) structures, measures included in several of the CRSO alternatives. After review of the literature and studies related to PSP structures, a range of assumed PSP efficiencies of 10%, 20% and 30% were included in the April 29, 2019 CSS analyses of the original CRSO-EIS alternatives. The most recent PA does not include surface passage structures. Consistent with the federal PA, within the present relative comparisons of alternatives, the analyses of PSP structures has been eliminated. Our conclusions are listed in the following bulleted summary statements, followed by a detailed discussion and tabular presentation of the results.

Comparing past CSS results with CRSO results

The results of the analyses of CRSO alternatives, utilizing the Action Agencies' inputs and the 80-year water record, align very closely with the CSS operations alternatives presented in the 2017 CSS Annual Report (McCann et al. 2017) and presented to the CRSO Fish Technical Team in September 2017. This is an important point because the 2017 CSS analyses considered only changes in spill levels at each project and breach of the four lower Snake River dams. In contrast, each CRSO alternative has many additional measures that were included in the modeled datasets (e.g., PSP structures, high-capacity turbines, tree planting). The alignment of the CSS 2017 results with the CRSO results indicate spill levels and breach are the primary measures affecting fish passage and survival metrics among these alternatives.

In addition, the scenario of 125% TDG spill level at the Lower Columbia projects (MCN-BON) and breach of the Lower Snake River projects was analyzed in the 2017 CSS Annual Report (McCann et al. 2017) and was found to have the highest benefits in terms of fish performance metrics, but this operation was not among the CRSO alternatives. The similarities in results of the 2017 CSS analysis and the CRSO analyses indicate that the 2017 CSS operations scenarios could be considered in the CRSO EIS.

Preferred Alternative

The Preferred Alternative (PA) is the 2020 Experimental Flex Spill Operation, agreed upon as an experimental approach to be implemented while the CRSO-EIS was being developed. The Flex Spill Experimental Operation is based on an hourly operation. Spill is provided at some projects for 16 hours at the 125% gas cap level and a lower "performance" spill level for 8 hours. At other projects, the 125% gas cap spill is not implemented. However, the "flex" in the Flex Spill operation means that the 8 hours of low spill is variable. It could occur anytime as determined by BPA. The 80-year water record dataset provided by the federal agencies is calculated on a daily average time step and, therefore, the hourly variation in lower "performance" spill is not captured in the federal dataset and as a result is not captured in the model analyses. This results in an overestimate of the benefits of the PA in the CSS analyses, because documented fish behavior shows that powerhouses are more efficient at catching fish at night than during daytime hours. This means that lower spill at night will increase PITPH. This is important because powerhouse passage (PITPH) is an input metric for CSS model analyses. This means that lower spill periods at night will increase PITPH. PITPH is an input variable for CSS analyses. The following example from analyses of acoustic tag data from the John Day project shows that PITPH is higher during nighttime hours than daytime hours, when the same spill and flow levels are provided (Figure 1). Using the relationship between spill proportion and powerhouse passage proportion shown in Figure 1 below, we estimated PITPH for steelhead would increase from 0.19 to 0.21 when Flex spill was carried out only at night versus all daytime hours.

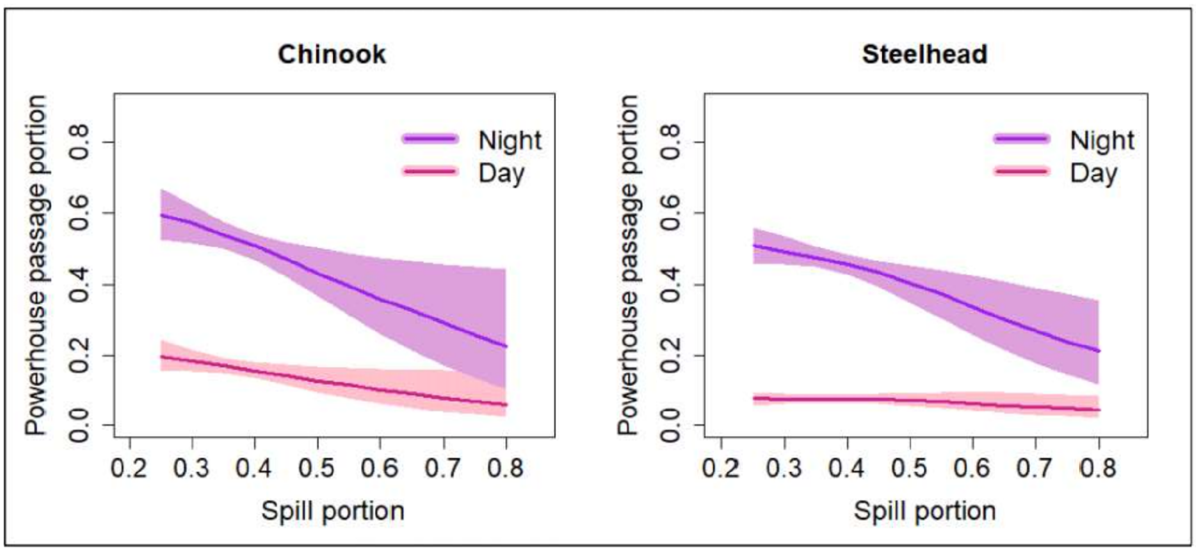

Figure 1. Powerhouse passage proportions at John Day Dam for yearling Chinook and steelhead as a function of spill proportion, at flows of 350 Kcfs. Figure is adapted from July 31, 2019 memorandum (FPC 2019b).

Performance relative to the regional 4% average SAR goals and analyses of SARs and productivity

The Northwest Power and Conservation Council (NPCC 2003, 2009, 2014) adopted a goal of achieving overall SARs (including jacks) in the 2%–6% range (4% average; 2% minimum) for federal ESA-listed Snake River and upper Columbia River salmon and steelhead.

The NPCC (2009) Fish and Wildlife Program objectives for unlisted populations or listed populations downstream of the Snake River and Upper Columbia River basins are to "significantly improve the smolt-to-adult return rates (SARs) for Columbia River Basin salmon and steelhead, resulting in productivity well into the range of positive population replacement." It is important to keep these NPCC SAR goals in mind when assessing results of modeled SARs from the various CRSO alternatives.

In addition, the 2017 CSS Annual Report included analyses of SARs and productivity for Snake River spring/summer Chinook and Snake River steelhead (McCann et al. 2017, Chapter 5). Results from these analyses indicated that population declines for spring/summer Chinook and steelhead were associated with brood year SARs less than 1% and increased life-cycle productivity occurred when SARs exceeded 2%. These results, are generally consistent with the NPCC 2-6% SAR objectives.

Performance in the face of climate change

The expected SARs resulting from the CRSO-EIS operations scenarios are presented as expected averages and the expected range from CSS cohort model analyses. Results for the CSS Life Cycle Model indicate a small positive bias in predictions (McCann et al. 2017). Therefore, consistent with the 2017 CSS Annual Report, the CSS Life Cycle model analyses are presented in relative terms among operations alternatives, rather than absolute values. It is important to carefully consider the lower end of these predicted ranges, because under future climate change scenarios, poor ocean conditions may occur more frequently than has occurred in the historic past which would mean the lower end of the predicted ranges is likely to occur more often.

Relative comparison of CRSO multiple objective alternatives

Five operational alternatives were originally analyzed: the No Action Alternative (NAA), and Multiple Objectives Alternatives 1-4 (MO1, MO2, MO3, and MO4) (FPC 2019a). In the following, each of the Multiple Objectives Alternatives and the Preferred Alternative are presented in comparison to the NAA as a baseline operation to illustrate the relative performance.

- **Preferred Alternative**: Because of the daily average datasets provided by the federal agencies, the CSS analyses of the PA are likely overestimating the predicted results of implementing the PA. For all fish metrics, the PA resulted in only slightly better performance than the NAA and MO1 and had lower performance than both MO3 and MO4. These results were consistent in both the CSS Life Cycle Model and CSS Cohort Model analyses. Average SARs from the CSS Cohort Model for the PA did not meet the regional 4% average SAR goal for either spring/summer Chinook or steelhead. The lower end of the predicted SAR range for the PA was less than 1% for both species, which is below the minimum to avoid population decline.
- **MO3**: MO3 demonstrated the greatest expected improvements compared to the NAA across all biological response metrics. This was consistent in both the CSS Life Cycle Model and CSS Cohort Model results. Average SARs from the CSS Cohort Model for MO3 consistently met the regional 4% average SAR goal for both spring/summer Chinook and steelhead. The lower end of the predicted SAR range for MO3 was 1.3%

for spring/summer Chinook and 1.6% for steelhead. It is important to note that MO3 was the only alternative that resulted in significantly faster water travel times.

- **MO4**: MO4 demonstrated large expected improvements compared to the NAA, but these improvements were less than those predicted under MO3. This was consistent in both the CSS Life Cycle Model and CSS Cohort Model results. Average SARs from the CSS Cohort Model were 3.4% for spring/summer Chinook and 3.0% for steelhead under MO4. The lower end of the predicted SAR range for MO4 was 0.9% for both species, which is below the minimum to avoid population decline.
- **MO1**: MO1 demonstrated similar performance compared to the NAA across all biological response metrics. This was consistent in both the CSS Life Cycle Model and CSS Cohort Model results. Average SARs from the CSS Cohort Model were 2.1% for spring/summer Chinook and 1.8% for steelhead under MO1. The lower end of the predicted SAR range for MO1 was 0.6% for spring/summer Chinook and 0.5% for steelhead, which are both below the minimum to avoid population decline.
- **MO2**: MO2 demonstrated substantial reductions in biological performance compared to the NAA across all biological response metrics. This was consistent in both the CSS Life Cycle Model and CSS Cohort Model results. Average SARs from the CSS Cohort Model were 1.2% for both spring/summer Chinook and steelhead under MO2. The lower end of the predicted SAR range for MO2 was 0.3% for both species, which is below the minimum to avoid population decline.

CRSO assumptions and their effects on alternatives

Powerhouse surface passage structures and their assumptions regarding effectiveness

Powerhouse surface passage (PSP) structures are included in several of the CRSO multiple objective alternatives. The specific designs and operations of these structures were not identified, however, passage effectiveness was assumed in CSS modeling (FPC 2019a). To capture the sensitivity of the CRSO relative results to the assumed passage efficiency of powerhouse surface passage structures, CSS analyses included 10%, 20% and 30% passage efficiency levels for PSP structures, where applicable. The results indicated that the PSP structures had a very small effect on fish passage metrics and model results and, therefore, it is unlikely that PSP structures will have a meaningful effect on SARs, survival rates, and other biological response metrics (FPC 2019a). The PA for the CRSO-EIS does not include PSP structures. Accordingly, assumptions and results from PSP structures have been removed from these analyses of the PA.

High Capacity turbines are included as a measure in several of the CRSO alternatives. However, the data sets provided by BPA did not include increases in flow through the powerhouses due to the installation of high capacity turbines.

The assumptions of increased survival through high capacity turbines ("fish friendly turbines") are not supported by any available studies. Survival estimates are, at best, equal to those of older turbine units (Skalski and Townsend 2005, Deng et al. 2019, Heisey et al. 2019). However, the higher flow through these turbines will cause higher absolute turbine passage, leading to lower overall dam survival and larger impacts of latent mortality.

- In “Turbine Improvement Assumptions Final”, the document used to justify increased survivals in CRSO modelling based on bead strike studies, the assumption that 50% of fish would experience mortality due to both low pressures and strike/shear. This number is not based on any biological study, data, or other form of evidence and should not be used in any survival estimates.
- The same document assumes equal improvements in direct and indirect turbine mortality. There is also no evidence provided for this assumption and it seems to be an example of wishful thinking. It should not be used in any survival estimates.
- The interpretation of bead strike studies has resulted in an assumption of a 50% decrease in turbine mortality. This assumption has not been backed up by increased survival in studies with live fish at Wanapum or Ice Harbor Dams, both of which showed no detectable increase in survival.
- Any increase in turbine capacity will increase the total number of smolts passing via the powerhouse. This will have impacts not only on concrete survival, but cumulative negative impacts throughout the hydrosystem.

Many of the CRSO alternatives assume reduced turbine mortality with the installation of new turbines. The draft CRSO Multi-objective Alternatives stated that these new turbines will improve fish passage conditions, lower TDG, and improve turbine efficiency and capacity. Turbine passage can directly cause fish mortality through blade strikes, rapid pressure changes, and other physical stresses. Turbine and powerhouse passage is also associated with delayed mortality, manifesting in the estuary or first year of ocean life. While direct mortality due to turbine passage has been studied primarily with models, sensor fish, and bead strike studies, tests with live smolts are relatively uncommon. Indirect and delayed mortality have been associated with powerhouse and turbine passage in a wide range of work demonstrating reduced estuary and first-year ocean survival for individuals who passed via one or more powerhouses during their outmigration (Haeseker et al. 2012, Petrosky and Schaller 2010, Tuomikoski et al. 2010, FPC 2010, FPC 2011a, FPC 2011b).

There are few studies available to test the assumptions of increased turbine survival. In 2005, a comparison of turbine survival was done at Wanapum Dam, comparing one high-capacity turbine to single turbine of the old design (Skalski and Townsend 2005). In this study, balloon and radio-tagged smolts were released into the turbines under a range of conditions, making it difficult to interpret the results of the tests. Both balloon and radio tags have a number of methodological problems, including: a) requiring a minimum size that does not represent the run-at-large, b) releasing fish via tubes into turbines that cause large pressure differences that do not approximate actual passage conditions, and c) tag burdens that significantly impede swimming ability and, therefore, affect the probability of blade strikes and other injuries. For extensive comments on the difficulties of interpreting the results of balloon tag studies, see FPC (2004), FPC (2012), JTS (2004), and JTS (2005). Additionally, a complicated study design makes determining a biologically significant difference between turbines virtually impossible to detect. A significant three-way interaction effect between turbine type, flow, and entry depth means that any difference in survival between the turbines cannot be separated from the other factors in the study. Although the study results have been described as showing equal survival between the turbines, the study design makes it impossible to determine if this result is a product of study design or if direct mortality is equal between the two turbine designs.

In 2019, sensor and balloon fish were deployed through the new turbine in Unit 2 of Ice Harbor Dam. The reports from these studies have not yet been made available, so a full review of their ability to address assumptions and interpretation of the results is not possible. However, the presentations at AFEP 2019 showed that severe shear or strike events were reduced only in two of four tested flows, and a reduction of 50% was only observed under one tested flow (Deng et al. 2019). Survivals of balloon-tagged fish were not significantly different under any of the tested conditions (Heisey et al. 2019). These studies indicate the increases in survival developed from bead strike studies and physical modelling efforts are overstated.

Modifications to the hydrosystem must be thought of in the context of the entire salmonid lifecycle, not just the concrete survival at each project. Even if the direct mortality of high-capacity turbines is shown to be no higher than that of the existing turbines, the increased turbine flow will lead to increase powerhouse passage of the run-at-large. This effect, compounded over multiple dams, will have a net negative impact on the smolt-to-adult returns. If the increased powerhouse flows are not included in the modeled datasets provided to the fish modelers, the increase in powerhouse passage will be lost.

CSS Life Cycle Model predictions of abundance and SARs

In 2017, the CSS used a life cycle model to compare predictions of in-river smolt survival, smolt to adult return rates (SARs), and long term predicted abundances of returning spawners of six Spring/Summer Chinook populations in the Grande Ronde / Imnaha major population group (MPG) (McCann et al. 2017). The analysis used a life cycle model that had been statistically validated against demographic and environmental trends, and that characterized uncertainty in estimated population demographic rates. The model simulated future trends based on empirically estimated demographic rates and simulated future conditions. Assumptions and methods are detailed in McCann et al. (2017).

This analysis makes use of the CSS model's underlying structure to simulate predicted population trends when supplied with FCRPS hydrosystem inputs and derived metrics that come from specified hydrosystem operation alternatives. The CRSO EIS Fish and Wildlife Technical Team supplied the CSS with hydrosystem metrics from an 80-year water record, which were used as inputs for CSS life cycle model simulations. Simulated future population trends using CRSO inputs are compared to the alternatives examined in McCann et al. (2017).

Data and Methods

The CSS life cycle model was statistically validated with historical spawner abundance data, smolt abundance data, empirically derived migration survival data, harvest data, and environmental variables used as predictors of survival probabilities. Validation was a retrospective analysis, but the resulting validated model was used to predict population trends under presumed future conditions, including hydrosystem conditions. Future conditions were simulated to mimic historically observed values using predictive sub-models (e.g.: sea surface temperature anomalies) and statistical resampling of historical conditions (e.g.: harvest and adult success). Rather than simulate yearly variation in juvenile migration conditions, the CSS analysis chose three years of known hydrosystem conditions that were distinct in term of hydrograph flow conditions (i.e., a high flow year, an average flow year, and a low flow year), and treated every year identically for the contrasts between distinct flow conditions. Upon each of the three distinct flow condition years, the CSS analysis imposed four hydrosystem operations alternatives: 1) the status quo BiOp spill levels (i.e., 2014 BiOp), 2) spill to 115% TDG limit at the forebay and 120% at the tailrace, 3) spill to 120% TDG at the tailrace, and 4) spill to 125% TDG at the tailrace. This resulted in twelve different scenarios for all combinations of the three flow levels and four spill levels. Twelve additional scenarios were evaluated using the same spill and flow conditions, but where the lower four Snake River dams are breached. A powerhouse passage index (PITPH) evaluated from PIT tag data and the water transit time (WTT) through the hydrosystem were derived at each of these twelve combinations. The values of PITPH and WTT are shown in Figure 1. The fixed values of PITPH and WTT were applied as constants each year in the simulations. The variability in simulated results came from the uncertainty in estimated parameters, variability in simulated ocean conditions, and resampling from empirical distributions of other historically observed conditions.

The replication of this analysis using CRSO inputs was performed by substituting the 2017 CSS scenario PITPH and WTT annual constants with a series of PITPH and WTT estimates derived from the 80-year water record of hydrosystem metrics predicted by CRSO hydro modelling. The CRSO technical team implemented multi-objective alternatives that predicted discharge routes of passage at specified temporal intervals, which were aggregated to time scales required to produce inputs to derive the CSS metrics. For comparison, a no-action alternative is implemented to represent status-quo management of the hydrosystem. The CRSO scenarios are described in Table 1.

Table 1. CRSO operational alternatives. NAA is the no-action alternative, MO1 - MO4 are multi-objective alternatives 1-4, and PA is the preferred alternative.

Scenario	Brief Description	Spring Spill	Summer Spill	Start of Transport	Powerhouse Surface Passage Routes	Fish Friendly Turbines
NAA	2016 FOP	2016 FOP	to Aug 31	May 1st	None	IHR, MCN
MO1	Block Design	Performance vs. 115%/120%	Performance Spill. Terminated as early as Aug. 1	April 15th	IHR, MCN	IHR, MCN, JDA
MO2	Spill to 110% TDG	110% TDG	110% TDG. Terminated on Aug. 1	April 25th	IHR, MCN, JDA	IHR, MCN, JDA
MO3	Breach Snake, 120% TDG in Mid-Columbia	120% TDG, not to exceed 150 Kcfs at BON	120% TDG, not to exceed 150 Kcfs at BON. Terminated on Aug. 1	None	MCN	IHR, MCN
MO4	125% TDG spill	125% Spill cap. Spring spill starts on March 1st	125% Spill cap, through Aug 31	April 25th	LGR, LGS, LMN, IHR, MCN, JDA	IHR, MCN, JDA
PA	2020 Flex Spill Agreement with potential for Adaptive Management	2020 Flex Spill levels	To Aug. 31, Performance spill through Aug 14, reduced from Aug 15-31.	April 20th but could occur as early as April 15th	None	IHR, MCN, JDA

Whereas the 2017 CSS analysis held WTT and PITPH constant every year for each alternative, the CRSO metrics produced 80-years of PITPH and WTT predictions for input as life cycle model variables (see Figure 2 and Figure 3). The CSS Life Cycle model also requires the proportion of fish transported, which again were treated as constants in the 2017 CSS analysis, but are based on year-specific predicted values for the CRSO modeling (Figure 4). Harvest is treated as a random draw from historical harvests. Ocean indices are simulated (McCann et al. 2017). Finally, SARs and return abundances for CRSO modeling were calculated slightly differently from the methods in McCann et al. (2017). In the CRSO analyses, the two metrics were averages over a random 10 year period in the 80-year simulations for each simulated outcome. This is in contrast to always taking the average of the last 10 years in the 2017 CSS Annual Report (McCann et al. 2017).

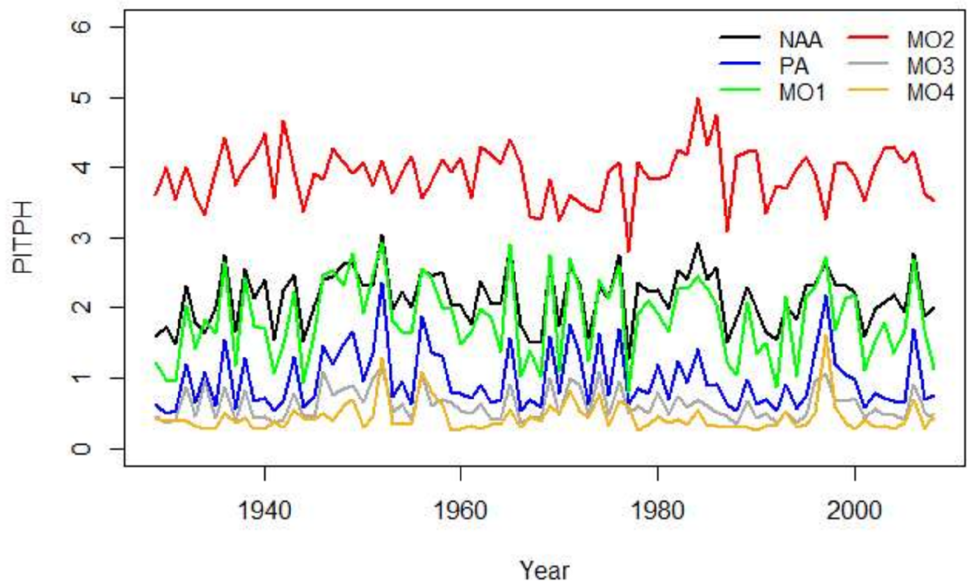

Figure 2. PITPH values derived from predicted hydrosystem conditions under CRSO alternatives, with no PSP structures.

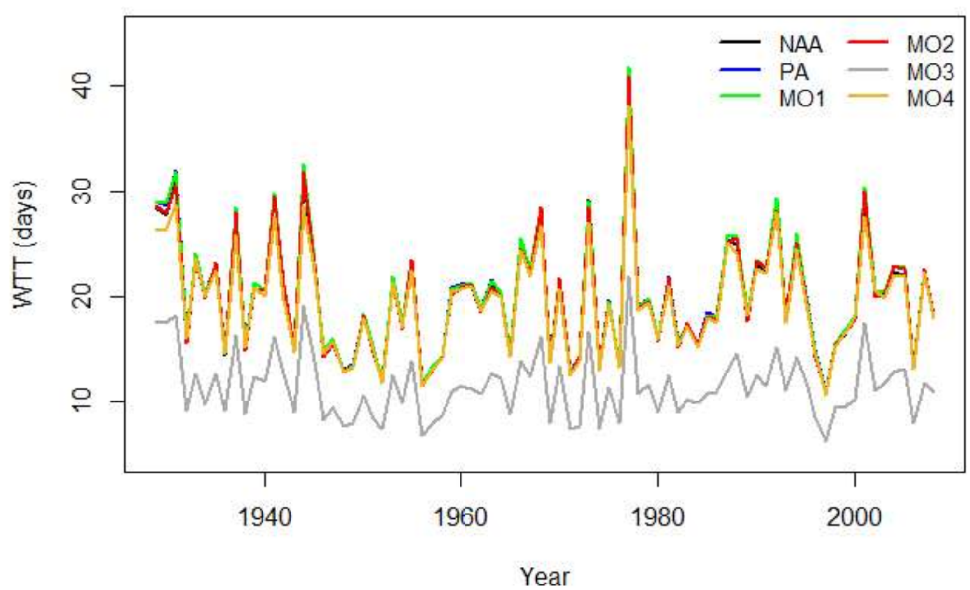

Figure 3. WTT values derived from predicted hydrosystem conditions under CRSO alternatives.

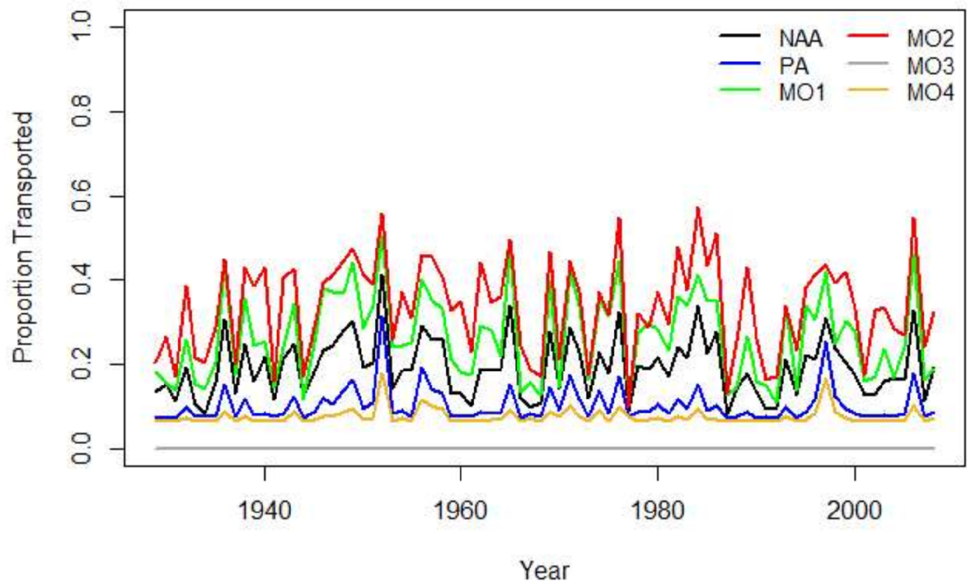

Figure 4. Proportion transported values derived from predicted hydrosystem and operational conditions under CRSO alternatives, with no PSP structures.

Results

Results for the six CRSO alternative scenario predictions using CRSO simulated hydro data are provided in Table 2 (predicted SARs) and Table 4 (predicted abundances). All values displayed are calculated using the median predictions. Consistent with the 2017 CSS Annual Report (McCann et al. 2017), predictions from the CSS Life Cycle Model cannot be considered as absolute values. Table 3 (SARs) and Table 5 (abundances) present the relative differences expected between the CRSO-EIS Alternatives, compared to the NAA. Examples of these predictions and relative comparisons are provided in Figure 5 (SARs) and Figure 6 (abundance).

Table 2. Median predicted SARs, with no powerhouse surface passage structures, using the CSS Life-Cycle Model.

Population	NAA	PA	MO1	MO2	MO3	MO4
CC	0.0275	0.0378	0.0279	0.0177	0.0487	0.0436
GR	0.0277	0.0389	0.0280	0.0178	0.0492	0.0434
IMN	0.0276	0.0391	0.0279	0.0177	0.0493	0.0435
LOS	0.0278	0.0385	0.0281	0.0177	0.0494	0.0437
MIN	0.0276	0.0385	0.0278	0.0176	0.0495	0.0439
WEA	0.0277	0.0374	0.0279	0.0177	0.0493	0.0435

Table 3. Performance of SARs relative to the NAA, with no powerhouse surface passage structures, using the CSS Life Cycle Model. Values greater than 1 indicate an increase over the NAA.

Population	NAA	PA	MO1	MO2	MO3	MO4
CC	1.00	1.38	1.01	0.64	1.77	1.59
GR	1.00	1.41	1.01	0.64	1.77	1.57
IMN	1.00	1.42	1.01	0.64	1.79	1.58
LOS	1.00	1.38	1.01	0.64	1.77	1.57
MIN	1.00	1.39	1.01	0.64	1.79	1.59
WEN	1.00	1.35	1.01	0.64	1.78	1.57

Table 4. Median predicted abundances, with no powerhouse surface passage structures, using the CSS Life-Cycle Model.

Population	NAA	PA	MO1	MO2	MO3	MO4
CC	232	375	239	103	560	450
GR	258	484	278	91	764	600
IMN	2549	3926	2577	1395	5297	4537
LOS	742	1148	764	374	1650	1391
MIN	1140	1673	1162	621	2385	2054
WEA	1193	2026	1205	442	3241	2662

Table 5. Abundances relative to the NAA, with no powerhouse surface passage structures, using the CSS Life Cycle Model. Values greater than 1 indicate an increase over the NAA.

Population	NAA	PA	MO1	MO2	MO3	MO4
CC	1.00	1.62	1.03	0.45	2.42	1.94
GR	1.00	1.88	1.08	0.35	2.97	2.33
IMN	1.00	1.54	1.01	0.55	2.08	1.78
LOS	1.00	1.55	1.03	0.50	2.22	1.87
MIN	1.00	1.47	1.02	0.55	2.09	1.80
WEA	1.00	1.70	1.01	0.37	2.72	2.23

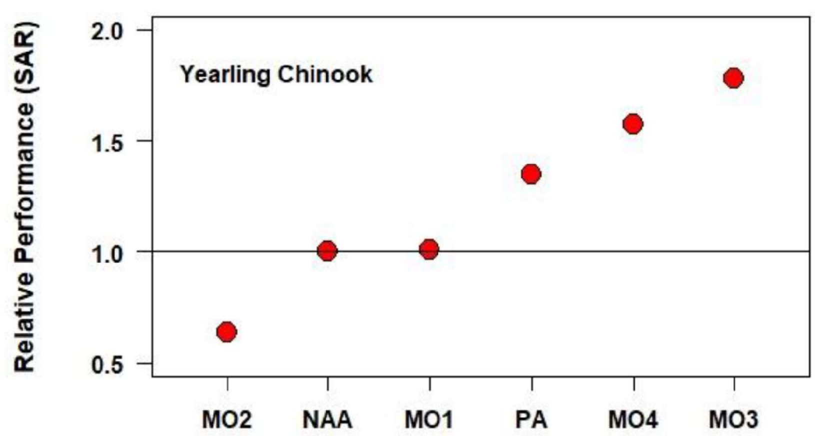

Figure 5. Life Cycle Model results of relative performance of SARs across CRSO alternatives. Relative performance data displayed are the average across all six of the sub-populations presented in Table 3. Values greater than one indicate higher predicted SARs than the NAA and values less than one indicate lower predicted SARs than the NAA.

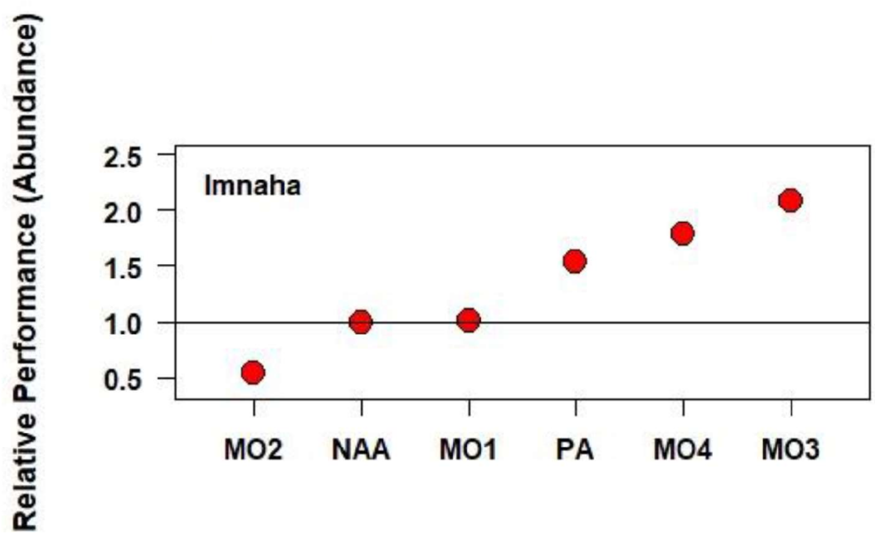

Figure 6. Life Cycle Model results of relative performance of abundance across CRSO alternatives. Data displayed are for the Imnaha population only, as presented in Table 5.

Cohort Model Predictions of CSS metrics Ocean Survival, SAR, juvenile fish travel time, juvenile fish survival and TIR relative to CRSO alternatives using the CSS Cohort Model.

Methods

The CSSOSC has established models and metrics for assessing environmental variables such as spill and flow on juvenile fish migration and smolt to adult return rates (CSSOC 2017). The CSSOC utilized these methodologies to generate a relative comparison of the CRSO operations alternatives on juvenile fish travel time, juvenile fish survival, TIR, ocean survival and smolt-to-adult return rate. Operations data at each project across the 80-year water record were used as inputs for the models. For each cohort and water year, 10,000 random simulations were generated using the parameters described in the models presented in CSSOC (2017).

Results

Across all of the biological response metrics, MO3 demonstrated the greatest improvements relative to the NAA. MO4 also demonstrated substantial improvements in biological response metrics relative to the NAA, but responses were somewhat less than MO3. Detailed results under each CRSO alternative, for both Snake River spring/summer Chinook and steelhead, are provided in Table 6 (juvenile survival), Table 7 (juvenile fish travel time), Table 8 (ocean survival rates), Table 9 (SARs), and Table 10 (Transport:In-river Ratios). These results are also provided in Figures 7 and 8 (juvenile survivals), Figures 9 and 10 (juvenile fish travel time), Figures 11 and 12 (ocean survival rates), Figures 13 and 14 (SARs), and Figures 15 and 16 (Transport:In-river Ratios), along with the relative performance of each alternative to the NAA.

Table 6. Predicted juvenile survival (LGR-BON) for yearling Chinook salmon and steelhead with inter-quartile ranges (parentheses) using the CSS cohort-specific model.

Alternative	Yearling Chinook		Steelhead	
NAA	0.576	(0.485 - 0.675)	0.571	(0.455 - 0.700)
MO1	0.579	(0.488 - 0.678)	0.578	(0.463 - 0.707)
MO2	0.520	(0.420 - 0.623)	0.394	(0.251 - 0.525)
MO3	0.680	(0.603 - 0.770)	0.829	(0.777 - 0.904)
MO4	0.632	(0.545 - 0.731)	0.729	(0.647 - 0.844)
PA	0.605	(0.516 - 0.705)	0.645	(0.542 - 0.773)

Table 7. Predicted LGR-BON juvenile fish travel times (days) for yearling Chinook salmon and steelhead with inter-quartile ranges (parentheses) using the cohort-specific model.

Alternative	Yearling Chinook		Steelhead	
NAA	15.8	(12.2 - 18.7)	16.2	(11.7 - 18.6)
MO1	15.7	(12.1 - 18.4)	16.3	(11.8 - 18.7)
MO2	18.3	(13.8 - 21.9)	17.6	(12.5 - 20.6)
MO3	12.5	(9.8 - 14.7)	11.0	(8.7 - 12.6)
MO4	13.7	(10.6 - 16.1)	14.7	(10.7 - 16.9)
PA	14.7	(11.3 - 17.2)	15.8	(11.4 - 18.1)

Table 8. Predicted ocean survival rates (BON-BON) for yearling Chinook salmon and steelhead with inter-quartile ranges (parentheses) using the cohort-specific model.

Alternative	Yearling Chinook		Steelhead	
NAA	0.036	(0.010 - 0.041)	0.036	(0.016 - 0.044)
MO1	0.038	(0.011 - 0.043)	0.037	(0.016 - 0.045)
MO2	0.025	(0.007 - 0.027)	0.024	(0.014 - 0.039)
MO3	0.059	(0.017 - 0.069)	0.046	(0.020 - 0.057)
MO4	0.055	(0.016 - 0.065)	0.042	(0.018 - 0.052)
PA	0.047	(0.013 - 0.054)	0.039	(0.017 - 0.048)

Table 9. Predicted SARs (LGR-BON) for yearling Chinook salmon and steelhead with inter-quartile ranges (parentheses) using the cohort-specific model.

Alternative	Yearling Chinook		Steelhead	
NAA	0.020	(0.005 - 0.022)	0.018	(0.005 - 0.022)
MO1	0.021	(0.006 - 0.022)	0.018	(0.005 - 0.022)
MO2	0.012	(0.003 - 0.013)	0.012	(0.003 - 0.013)
MO3	0.042	(0.012 - 0.048)	0.050	(0.016 - 0.061)
MO4	0.034	(0.009 - 0.037)	0.030	(0.009 - 0.036)
PA	0.027	(0.007 - 0.029)	0.023	(0.007 - 0.027)

Table 10. Predicted Transport:In-river Ratios (TIRs) for wild yearling Chinook salmon and steelhead with inter-quartile ranges (parentheses). No transportation would occur under MO3.

Alternative	Yearling Chinook		Steelhead	
NAA	0.86	(0.64 - 1.03)	1.41	(0.69 - 1.77)
MO1	0.69	(0.51 - 0.82)	1.09	(0.53 - 1.37)
MO2	1.29	(0.95 - 1.54)	2.51	(1.23 - 3.16)
MO3	NA		NA	
MO4	0.58	(0.42 - 0.69)	0.82	(0.40 - 1.04)
PA	0.62	(0.46 - 0.75)	1.09	(0.53 - 1.37)

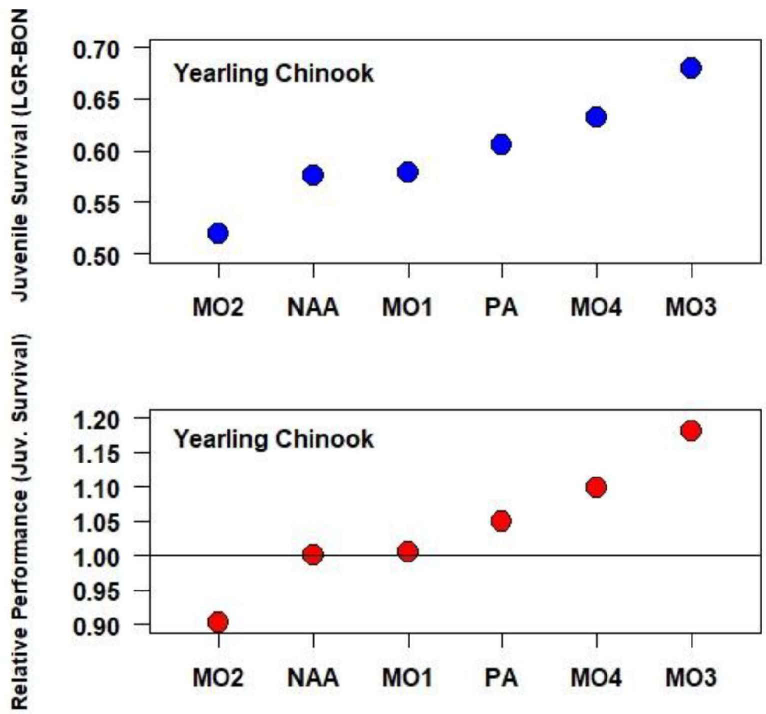

Figure 7. Yearling Chinook juvenile survival (top) and relative performance (bottom) using the cohort-specific model.

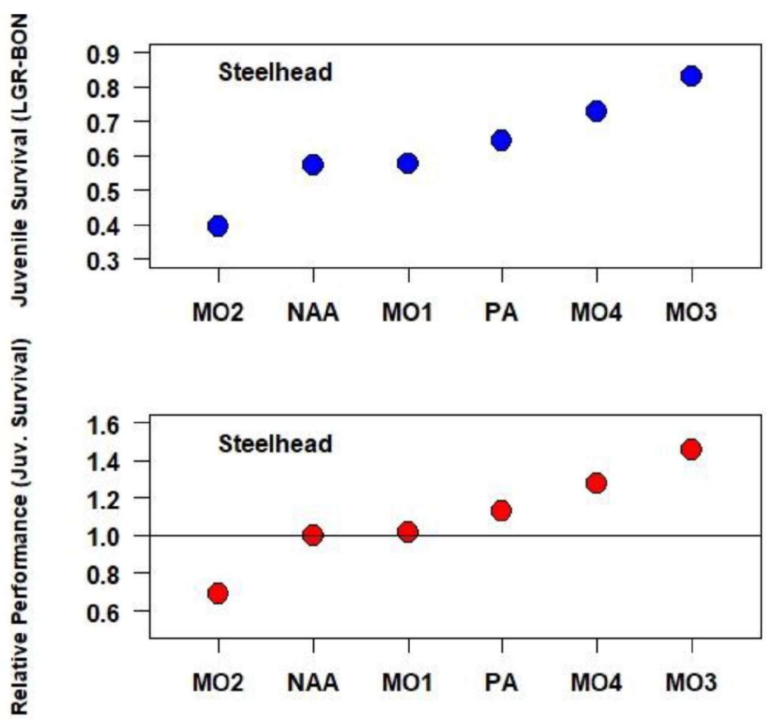

Figure 8. Steelhead juvenile survival (top) and relative performance (bottom) using the cohort-specific model.

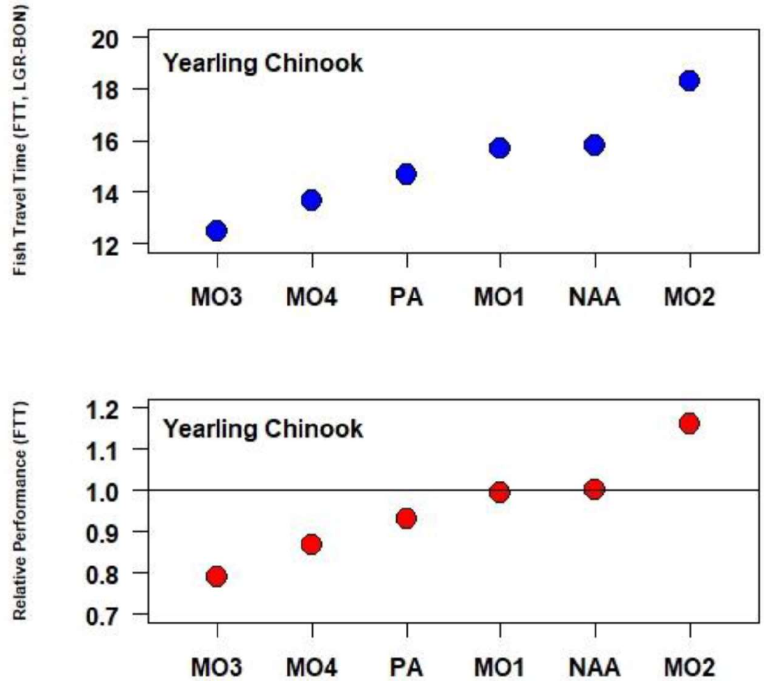

Figure 9. Yearling Chinook FTT (top) and relative performance (bottom) using the cohort-specific model.

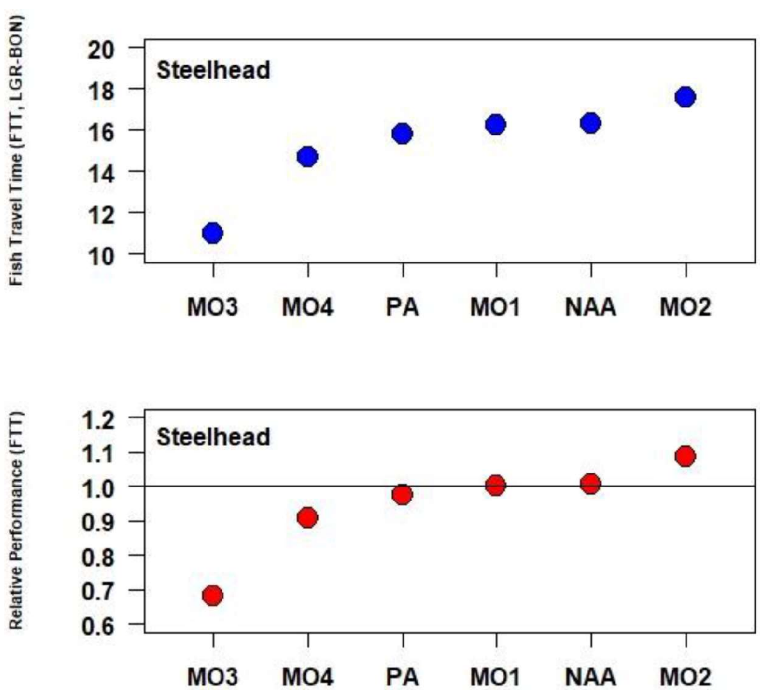

Figure 10. Steelhead FTT (top) and relative performance (bottom) using the cohort-specific model.

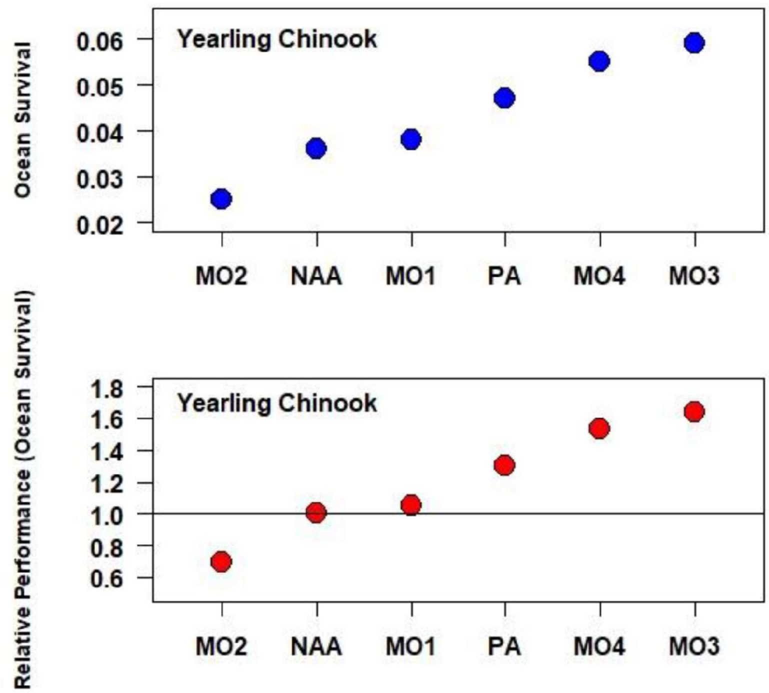

Figure 11. Yearling Chinook ocean survival (top) and relative performance (bottom) using the cohort-specific model.

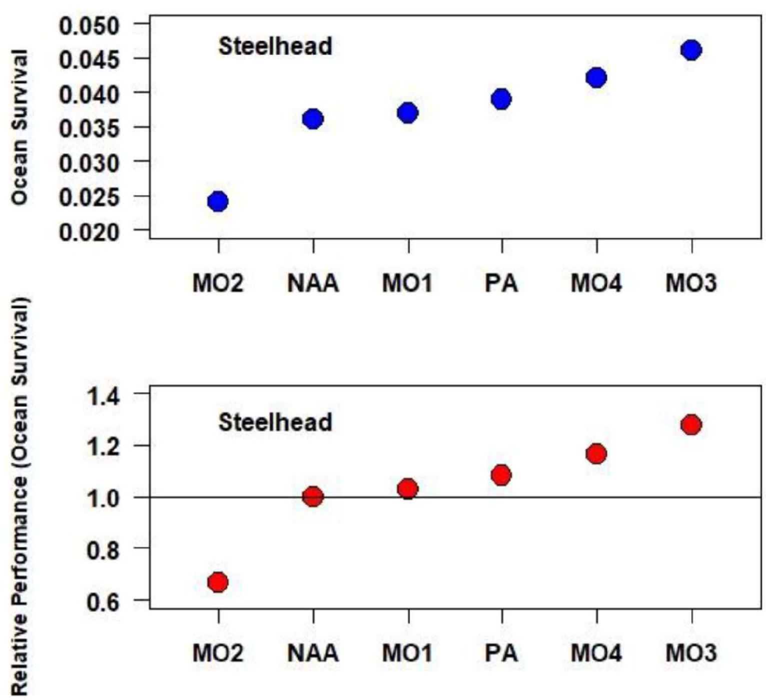

Figure 12. Steelhead ocean survival (top) and relative performance (bottom) using the cohort-specific model.

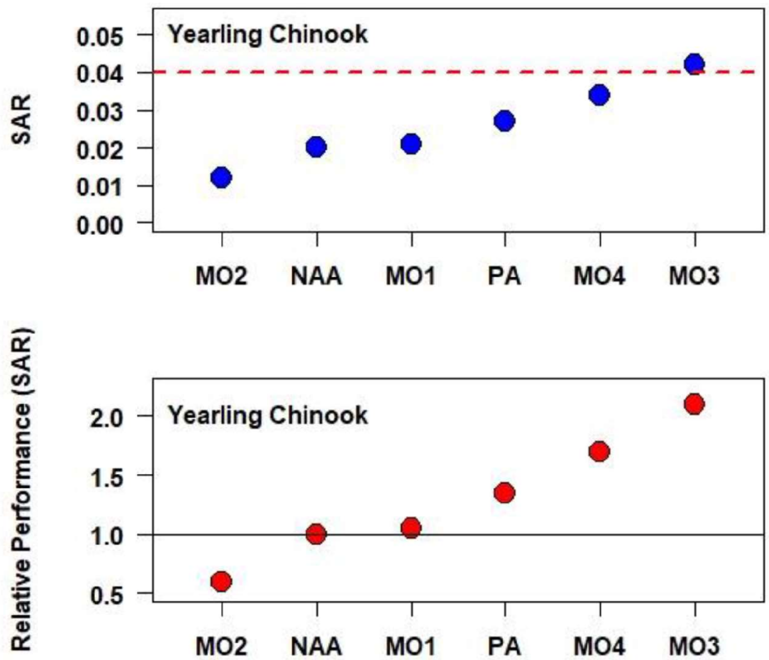

Figure 13. Yearling Chinook SARs (top) and relative performance (bottom) using the cohort-specific model. The red dashed line in the upper panel represents the NPCC average SAR goal of 4%.

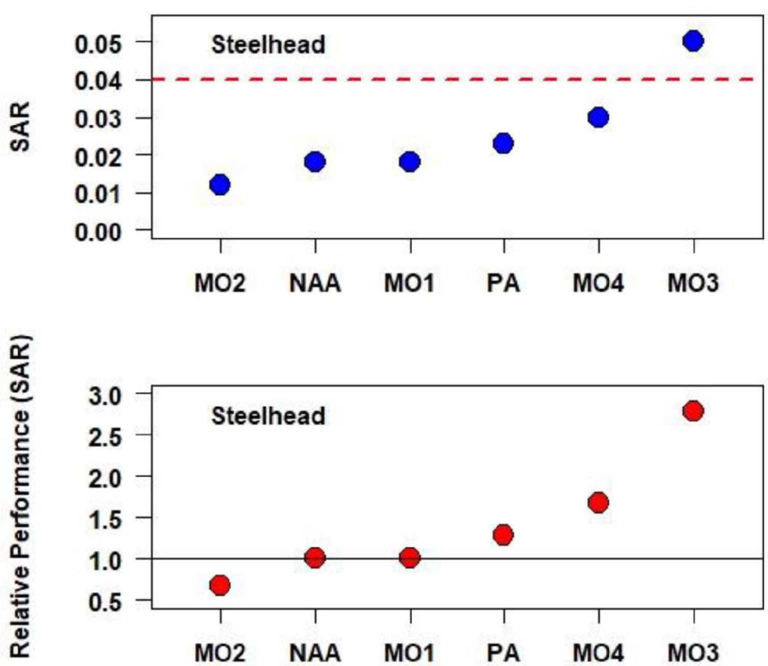

Figure 14. Steelhead SARs (top) and relative performance (bottom) using the cohort-specific model. The red dashed line in the upper panel represents the NPCC average SAR goal of 4%.

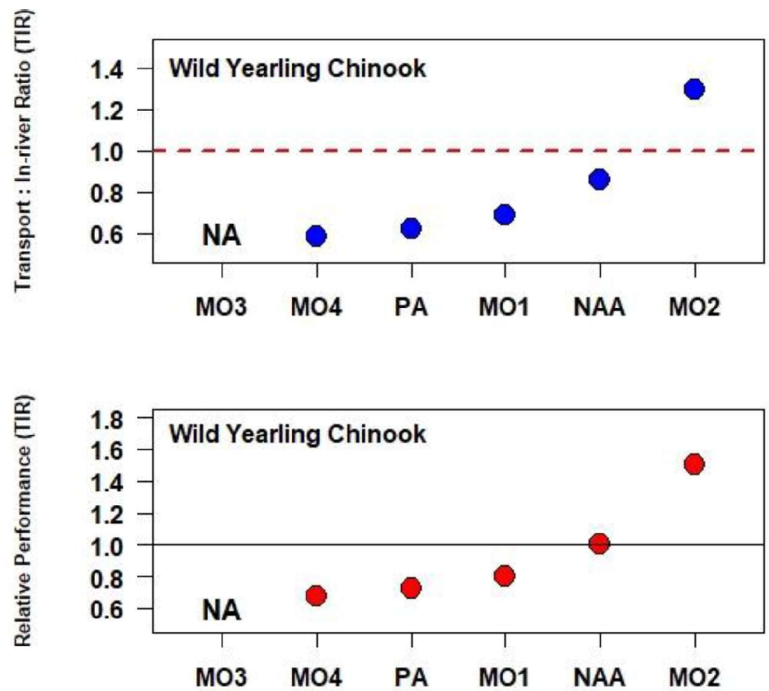

Figure 15. Wild Yearling Chinook TIRs (top) and relative performance (bottom) using the cohort-specific model. The red dashed line in the upper panel represents a TIR of one.

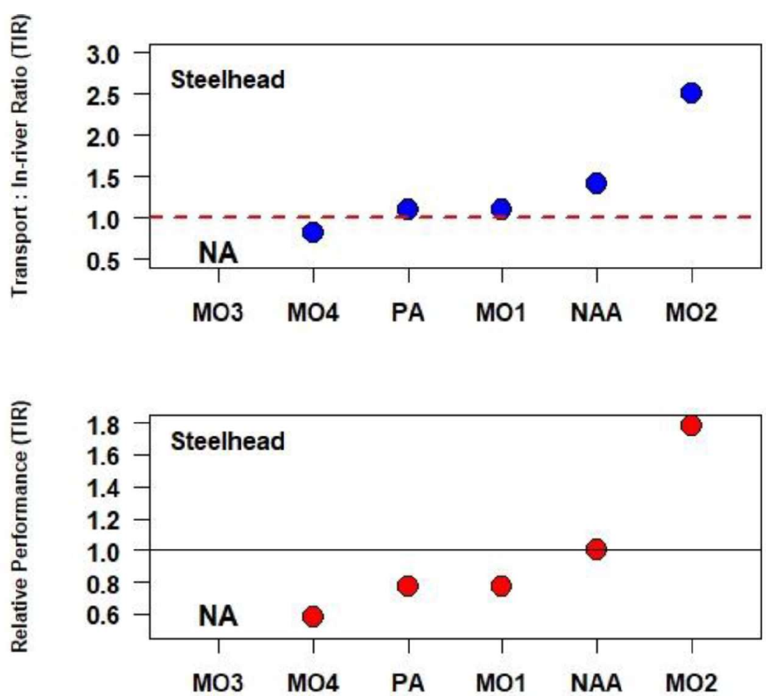

Figure 16. Steelhead TIRs (top) and relative performance (bottom) using the cohort-specific model. The red dashed line in the upper panel represents a TIR of one.

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From: Doumbia,Julie A (BPA) - EC-5

Sent: Sun Jul 07 20:56:44 2019

To: Daniel Widener - NOAA Affiliate; James Faulkner - NOAA Federal; Michele Dehart; Rich Zabel - NOAA Federal

Cc: Chuck Chamberlain (NWW); Sue Camp (scamp@usbr.gov); Petersen,Christine H (BPA) - EWP-4; Hauser,Tracy L (BPA) - EWL-4

Subject: RE: REVIEW REQUESTED BY JULY 12: SR Steelhead modeling

Importance: Normal

Attachments: Main_EIS_CH3_Fish_MO1-4_UC_Sp_Chinook_Steelhead_Modeling_COMPASS_LCM.docx

Hello Fish Modelers,

[redacted]

(b) (5)

Thanks very much again everyone,

Julie

From: Doumbia,Julie A (BPA) - EC-5
Sent: Wednesday, July 03, 2019 8:45 AM
To: 'Daniel Widener - NOAA Affiliate'; 'James Faulkner - NOAA Federal'; 'Michele Dehart'; 'Rich Zabel - NOAA Federal'
Cc: Chuck Chamberlain (NWW); Sue Camp (scamp@usbr.gov); Petersen,Christine H (BPA) - EWP-4; Hauser,Tracy L (BPA) - EWL-4
Subject: REVIEW REQUESTED BY JULY 12: SR Steelhead modeling

Hello Fish Modelers,

[redacted]

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[redacted]

[redacted]

Thank you all again,

Julie

From: Doumbia,Julie A (BPA) - EC-5
Sent: Friday, June 28, 2019 11:53 AM
To: 'Daniel Widener - NOAA Affiliate'; 'James Faulkner - NOAA Federal'; 'Michele Dehart'; 'Rich Zabel - NOAA Federal'
Cc: Chuck Chamberlain (NWW); Sue Camp (scamp@usbr.gov); Petersen,Christine H (BPA) - EWP-4; Hauser,Tracy L (BPA) - EWL-4
Subject: REMINDER: REVIEW REQUESTED BY JUNE 28: SR Sp/Su Chinook modeling

Hello Fish Modelers,

[redacted]

(b) (5) [redacted]

Thank you all again!

Julie

From: Doumbia,Julie A (BPA) - EC-5
Sent: Monday, June 24, 2019 8:38 AM
To: Daniel Widener - NOAA Affiliate; James Faulkner - NOAA Federal; Michele Dehart; Rich Zabel - NOAA Federal
Cc: Chuck Chamberlain (NWW); Sue Camp (scamp@usbr.gov); Petersen,Christine H (BPA) - EWP-4; Hauser,Tracy L (BPA) - EWL-4
Subject: REVIEW REQUESTED BY JUNE 28: SR Sp/Su Chinook modeling

Hello Fish Modelers,

(b) (5) [redacted]

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[redacted]

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[redacted]

Julie

Julie Doumbia

Environmental Protection Specialist

Bonneville Power Administration
bpa.gov | P 503-230-7641 | C (b) (6) [redacted]

CHAPTER 3 - ENVIRONMENTAL CONSEQUENCES

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From: Hauser,Tracy L (BPA) - EWL-4

Sent: Thu Feb 13 17:00:10 2020

To: Michele Dehart

Cc: Jule,Kristen R (BPA) - EWP-4

Subject: RE: EIS CSS model presentation

Importance: Normal

Hi Michele

For now focus on Chapter 2 and let's see what Kristen reports back. I'm sure someone will be in touch with you and could probably provide you more details – I get the impression this is not a huge ask. ~ T

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Tracy L. Hauser, F&W Project Mgr cid:image001.png@01D3C808.E543B670

From: Michele Dehart <mdehart@fpc.org>
Sent: Thursday, February 13, 2020 4:40 PM
To: Hauser,Tracy L (BPA) - EWL-4 <tlhauser@bpa.gov>
Subject: [EXTERNAL] RE: EIS CSS model presentation

Tracy:

As I say no one contacted me about this, so I am a bit surprised. The pressure is really on for us to get that chapter 2 done.

Michele

From: Hauser,Tracy L (BPA) - EWL-4 [mailto:tlhauser@bpa.gov]
Sent: Thursday, February 13, 2020 4:37 PM
To: Michele Dehart <mdehart@fpc.org>
Cc: 'Bob Lessard' <lessard@critfc.org>; Steve_Haeseker@fws.gov; Adam J Storch <Adam.J.Storch@state.or.us>; 'Dan Rawding (daniel.rawding@dfw.wa.gov)' <daniel.rawding@dfw.wa.gov>; 'Tim Copeland (tim.copeland@idfg.idaho.gov)' <tim.copeland@idfg.idaho.gov>; Tucker Jones <Tucker.A.Jones@state.or.us>; Rob Lothrop (lotr@critfc.org) <lotr@critfc.org>; Jule,Kristen R (BPA) - EWP-4 <krjule@bpa.gov>
Subject: RE: EIS CSS model presentation

Michele the Corps has contracted with Battelle to lead the review. I have shared this with Kristen Jule so she can follow up with the right folks on your concerns below. ~ Tracy

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Tracy L. Hauser, F&W Project Mgr   cid:image001.png@01D3C808.E543B670

From: Michele Dehart <mdehart@fpc.org>
Sent: Thursday, February 13, 2020 4:02 PM

To: Hauser,Tracy L (BPA) - EWL-4 <tlhauser@bpa.gov>
Cc: 'Bob Lessard' <lessard@critfc.org>; Steve_Haeseker@fws.gov; Adam J Storch <Adam.J.Storch@state.or.us>; 'Dan Rawding (daniel.rawding@dfw.wa.gov)' <daniel.rawding@dfw.wa.gov>; 'Tim Copeland (tim.copeland@idfg.idaho.gov)' <tim.copeland@idfg.idaho.gov>; Tucker Jones <Tucker.A.Jones@state.or.us>; Rob Lothrop (lotr@critfc.org) <lotr@critfc.org>
Subject: [EXTERNAL] RE: EIS CSS model presentation

Tracy:

I have not been contacted by the Corps. On August 15, 2019 we provided all of the models code, and coefficients and documentation for the cohort model to Chuck Chamberlain at the COE as they requested. We have provided all of the documents explaining the models. They have had a significant amount of time and they have everything they need, including years of CSS Annual Reports and ISAB reviews, to conduct a review. If after reviewing the considerable amount of documentation provided to them regarding the COE models, the reviewers have specific questions, I strongly suggest they provide those questions to us in writing and we will respond in writing. I suggest that it would be most efficient to coordinate the COE model peer review with the already planned ISAB and public review of these analyses.

The March 3 through 10 time frame is not workable for the CSS Oversight Committee. From now through March 9, the top work priority focus for the CSS Oversight Committee is completion of Chapter 2, of the CSS Annual Report. You recall that this chapter is due to be released on or around February 28, 2020. The topic of Chapter 2 is the CSS model analyses, including documentation of methods and results. of the CRSO alternatives including documentation of methods and results . This Chapter will be reviewed by the Independent Scientific Advisory Board of the Northwest Power and Conservation Council as well as the public at large. We will respond to all written comments. I suggest that it would be most efficient to complete chapter 2, then the Corps peer reviewers can review that chapter and provide written comments and questions in writing.

Please let me know who comprises the COE peer review panel.

Michele Dehart, Manager

The Fish Passage Center

From: Hauser,Tracy L (BPA) - EWL-4 [mailto:tlhauser@bpa.gov]
Sent: Thursday, February 13, 2020 3:30 PM
To: Michele Dehart <mdehart@fpc.org>
Subject: EIS CSS model presentation

Hi Michele

I wanted to reach out to you and let you know that the Corps is doing an independent peer review of the CRO/EIS models and you will be contacted to present on March 3, 2020 between 12-3 a brief overview (10-15 minutes) of your CSS model. If you have existing presentation material, you can use that and you can do it over phone and WebEx so no need to travel unless you want to do it in person. Then if needed, they may have additional follow up questions sometime in April/May that you can respond via phone or email. ~ Tracy

If you have questions you can contact the following staff:

Leah Hauenstein, Leah.J.HAUENSTEIN@usace.army.mil

Desk: 206-316-3169

Rachel Mesko Rachel.C.Mesko@usace.army.mil

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Tracy L. Hauser, F&W Project Mgr cid:image001.png@01D3C808.E543B670

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P Please consider the **environment** before printing this e-mail

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From: Doumbia,Julie A (BPA) - EC-5

Sent: Tue Jun 18 12:16:58 2019

To: Michele Dehart

Cc: Chuck Chamberlain (NWW); Sue Camp (scamp@usbr.gov)

Subject: RE: tom iverson memo

Importance: Normal

Got it, that helps clarify memo numbering – thank you!

Julie

From: Michele Dehart [mailto:mdehart@fpc.org]
Sent: Friday, June 14, 2019 3:00 PM
To: Doumbia,Julie A (BPA) - EC-5; Tom Iverson (t.k.iverson@comcast.net); Tucker Jones (tucker.a.jones@state.or.us); Art Martin; Adam Storch (adam.j.storch@state.or.us); Steve_Haeseker@fws.gov; Chuck Chamberlain (Charles.B.Chamberlain@usace.army.mil); Robert Lessard (LESR@critfc.org); tim.copeland@idfg.idaho.gov; Rawding, Daniel J (DFW) (Daniel.Rawding@dfw.wa.gov); Hauser,Tracy L (BPA) - EWL-4; Garrity, Michael D (DFW) (Michael.Garrity@dfw.wa.gov)
Subject: [EXTERNAL] RE: tom iverson memo

Julie:

You have all of the CRSO documents we have prepared, responses to your own requests and responses to other requests like the recent response to Tom Iverson of the Yakama Nation. Because of the non-disclosure agreements, we have established an internal document system to keep all CRSO documents and emails, like this one I am writing to you now, in a separate system. So each document has a number and each email is saved and has a number. This email will be saved and assigned a document number. This is just our way of being organized and staying true to the non-disclosure agreement. This is why the document numbers seem to be out of sequence to you.

Michele DeHart, Manager

The Fish Passage Center

From: Doumbia,Julie A (BPA) - EC-5 [mailto:jadoumbia@bpa.gov]
Sent: Friday, June 14, 2019 1:37 PM
To: Michele Dehart; Tom Iverson (t.k.iverson@comcast.net); Tucker Jones (tucker.a.jones@state.or.us); Art Martin; Adam Storch (adam.j.storch@state.or.us); Steve_Haeseker@fws.gov; Chuck Chamberlain (Charles.B.Chamberlain@usace.army.mil); Robert Lessard (LESR@critfc.org); tim.copeland@idfg.idaho.gov; Rawding, Daniel J (DFW) (Daniel.Rawding@dfw.wa.gov); Hauser,Tracy L (BPA) - EWL-4
Subject: RE: tom iverson memo

Hello Michele,

I'll check on the status of our co-lead agencies' policy of not funding cooperating agency participation in the EIS, since my understanding was that there was a strict policy about not funding CA participation in this EIS, since it seems if they are requesting analyses from FPC using BPA project funding instead of using their own staff time and expertise.

Also, could you send us your CRSO memos 1-31? The last memo we received was CRSO-24, this one is numbered CRSO-32…. are we missing something?

Thanks again,

Julie

From: Michele Dehart [mailto:mdehart@fpc.org]
Sent: Friday, June 14, 2019 12:51 PM
To: Tom Iverson (t.k.iverson@comcast.net); Tucker Jones (tucker.a.jones@state.or.us); Art Martin; Adam Storch (adam.j.storch@state.or.us); Steve_Haeseker@fws.gov; Chuck Chamberlain (Charles.B.Chamberlain@usace.army.mil); Doumbia,Julie A (BPA) - EC-5; Robert Lessard (LESR@critfc.org); tim.copeland@idfg.idaho.gov; Rawding, Daniel J (DFW) (Daniel.Rawding@dfw.wa.gov)
Subject: [EXTERNAL] FW: tom iverson memo

Tom:

Attached is our response to questions regarding the CSS models analyses. I am sending a copy to Julie Doumbia, BPA, as an appendix to the response to the modelling questions we received and to Charles Chamberlain at the COE so he can include this in the packet of materials that he provides to the USACOE Statistical Peer Review

Panel for the CRSO analyses.

As with other CRSO materials, this will not be posted on the FPC website. Since the Yakama Nation is a cooperating agency I can send you a copy of the response to BPA questions.

Please call if you have questions

Michele

From: Hauser,Tracy L (BPA) - EWL-4

Sent: Thu Oct 24 14:52:40 2019

To: Michele Dehart

Subject: RE: Preferred Alternative

Importance: Normal

Michele
That's fine, you will be covered with the extension I did through February for WE F CRSO tasks. ~ T

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Tracy L. Hauser, F&W Project Mgr

-----Original Message-----
From: Michele Dehart <mdehart@fpc.org>
Sent: Thursday, October 24, 2019 11:51 AM
To: Hauser,Tracy L (BPA) - EWL-4 <tlhauser@bpa.gov>
Subject: [EXTERNAL] FW: Preferred Alternative

Just an FYI. It looks like we will be working on that CRSO work element into January and perhaps February depending on when the data sets are available.
Michele

-----Original Message-----
From: Chamberlain, Charles B CIV USARMY CENWW (USA) [mailto:Charles.B.Chamberlain@usace.army.mil]
Sent: Thursday, October 24, 2019 11:02 AM
To: Daniel Widener - NOAA Affiliate; Michele Dehart
Cc: Granet, Jesse J CIV USARMY CENWD (USA); Hauenstein, Leah J CIV (USA)
Subject: Preferred Alternative

Dan and Michele,

I just received word that the Preferred Alternative is still in development and you will likely get that information later in November and will receive data in December. We will incorporate it into the draft EIS just before it goes out for public review in February. Thanks for your patience and your help.

Charles Chamberlain
Biologist
US Army Corps of Engineers
Walla Walla District
201 North 3rd Avenue
Walla Walla, WA 99362
509-527-7298

From: Doumbia,Julie A (BPA) - EC-5

Sent: Thu Jul 11 13:18:01 2019

To: Michele Dehart

Subject: [EXTERNAL] Comments Draft EIS chapter 3 - steelhead

Importance: Normal

Great, thanks Michele, will do - thank you also for sending these over ahead of the deadline tomorrow, much appreciated!

Julie

On Jul 11, 2019 1:09 PM, Michele Dehart <mdehart@fpc.org> wrote:

> Julie:
>
> Attached are the FPC/CSS comments on the Draft CRSO EIS Chapter 3 – Steelhead which you distributed to us for review.
>
> Thank you for the opportunity to review the draft.
>
> Please let us know if you have questions.
>
> Michele DeHart, Manager

The Fish Passage Center

503-833-3901

From: Michele Dehart

Sent: Thu Feb 13 16:01:36 2020

To: Hauser,Tracy L (BPA) - EWL-4

Cc: 'Bob Lessard'; Steve_Haeseker@fws.gov; Adam J Storch; 'Dan Rawding (daniel.rawding@dfw.wa.gov)'; 'Tim Copeland (tim.copeland@idfg.idaho.gov)'; Tucker Jones; Rob Lothrop (lotr@critfc.org)

Subject: [EXTERNAL] RE: EIS CSS model presentation

Importance: Normal

Tracy:

I have not been contacted by the Corps. On August 15, 2019 we provided all of the models code, and coefficients and documentation for the cohort model to Chuck Chamberlain at the COE as they requested. We have provided all of the documents explaining the models. They have had a significant amount of time and they have everything they need, including years of CSS Annual Reports and ISAB reviews, to conduct a review. If after reviewing the considerable amount of documentation provided to them regarding the COE models, the reviewers have specific questions, I strongly suggest they provide those questions to us in writing and we will respond in writing. I suggest that it would be most efficient to coordinate the COE model peer review with the already planned ISAB and public review of these analyses.

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Michele Dehart, Manager

The Fish Passage Center

From: Hauser,Tracy L (BPA) - EWL-4 [mailto:tlhauser@bpa.gov]
Sent: Thursday, February 13, 2020 3:30 PM
To: Michele Dehart <mdehart@fpc.org>
Subject: EIS CSS model presentation

Hi Michele

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If you have questions you can contact the following staff:

Leah Hauenstein, Leah.J.HAUENSTEIN@usace.army.mil

Desk: 206-316-3169

Rachel Mesko Rachel.C.Mesko@usace.army.mil

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Tracy L. Hauser, F&W Project Mgr cid:image001.png@01D3C808.E543B670

Bonneville Power Administration

Fish & Wildlife, Oregon Implementation

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503-230-4564 fax

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31x31

P Please consider the **environment** before printing this e-mail

cid:image004.png@01D1600B.54563E60

From: Doumbia,Julie A (BPA) - EC-5

Sent: Tue Jun 04 10:22:20 2019

To: Daniel Widener - NOAA Affiliate; James J Anderson (jjand@uw.edu); James Faulkner - NOAA Federal; Michele Dehart; nickbeer@uw.edu; Rich Zabel - NOAA Federal

Cc: Chuck Chamberlain (NWW); Sue Camp (scamp@usbr.gov); Petersen,Christine H (BPA) - EWP-4; Hauser,Tracy L (BPA) - EWL-4

Subject: 6/4 CRSO Fish Modeling Update

Importance: Normal

Hello CRSO Fish Modelers,

(b) (5) [redacted]

[redacted]

If you have any questions or issues with the June 21st date or other updates above, please discuss with us before this Friday, June 7th.

Thank you all again,

Julie

From: Doumbia,Julie A (BPA) - EC-5
Sent: Thursday, May 23, 2019 10:14 AM
To: 'Daniel Widener - NOAA Affiliate'; James J Anderson (jjand@uw.edu); 'James Faulkner - NOAA Federal'; 'Michele Dehart'; nickbeer@uw.edu; 'Rich Zabel - NOAA Federal'
Cc: Chuck Chamberlain (NWW); Sue Camp (scamp@usbr.gov); Petersen,Christine H (BPA) - EWP-4; Hauser,Tracy L (BPA) - EWL-4
Subject: 5/23 CRSO Fish Modelers Update

Hello CRSO Fish Modelers,

[redacted]

Lastly, ***a big thank you*** to the fish modeling groups who have been delivering their modeling results on time – it makes a difference.

Thank you all again,

Julie

Julie Doumbia

Environmental Protection Specialist

Bonneville Power Administration
[bpa.gov](bpa.gov) | P 503-230-7641 | C (b) (6) [redacted]

From: Sweet,Jason C (BPA) - PGB-5

Sent: Fri Mar 13 07:50:18 2020

To: Michele Dehart; Chamberlain, Charles B CIV USARMY CENWW (USA)

Subject: RE: CRSO EIS Raw Data

Importance: Normal

I think that some summary statistics for probabilities around the 80 different years would be helpful, but if they are not readily available we are not looking for additional analysis at this point.

Jason

-----Original Message-----
From: Michele Dehart <mdehart@fpc.org>
Sent: Friday, March 13, 2020 7:24 AM
To: Sweet,Jason C (BPA) - PGB-5 <jcsweet@bpa.gov>; Chamberlain, Charles B CIV USARMY CENWW (USA) <Charles.B.Chamberlain@usace.army.mil>
Subject: [EXTERNAL] RE: CRSO EIS Raw Data

Jason:
For additional clarity are you asking for probabilities of outcomes from the simulation outputs for each year in the 80 year water record?
Michele

-----Original Message-----
From: Sweet,Jason C (BPA) - PGB-5 [mailto:jcsweet@bpa.gov]
Sent: Thursday, March 12, 2020 2:40 PM
To: Chamberlain, Charles B CIV USARMY CENWW (USA) <Charles.B.Chamberlain@usace.army.mil>; Michele Dehart <mdehart@fpc.org>
Subject: RE: CRSO EIS Raw Data

Hi Michele,

To add to Chuck's response, we are looking for the single result (after running the 10,000 random simulations) for each metric that lines up with each of the 80 different water conditions. We appreciate that you have provided the mean result as well as the inter-quartile ranges in the memo, but we are requesting the full set of 80 predicted outcomes for the NAA, MO1, MO2, MO3, MO4 and the PA. As an example of what we are asking for, please see Table 4-1 in Appendix E. We will plan to add the raw CSS data to appendix E as well. Thanks.

Jason

-----Original Message-----
From: Chamberlain, Charles B CIV USARMY CENWW (USA) <Charles.B.Chamberlain@usace.army.mil>
Sent: Thursday, March 12, 2020 2:09 PM
To: Michele Dehart <mdehart@fpc.org>
Cc: Sweet,Jason C (BPA) - PGB-5 <jcsweet@bpa.gov>
Subject: [EXTERNAL] RE: CRSO EIS Raw Data

Michele,

Thanks for responding. What we were hoping to get is the entire 80 year data set so that we can view a specific water year type and see projected travel times, PITPH and survivals etc. under differing water years.

Charles Chamberlain
Biologist
US Army Corps of Engineers
Walla Walla District
201 North 3rd Avenue
Walla Walla, WA 99362
509-527-7298

-----Original Message-----
From: Michele Dehart [mailto:mdehart@fpc.org]
Sent: Thursday, March 12, 2020 1:57 PM
To: Chamberlain, Charles B CIV USARMY CENWW (USA) <Charles.B.Chamberlain@usace.army.mil>
Cc: Jerry McCann <jmccann@fpc.org>; Brandon Chockley <bchockley@fpc.org>; Haeseker, Steve <Steve_haeseker@fws.gov>; 'Bob Lessard' <lessard@critfc.org>
Subject: [Non-DoD Source] RE: CRSO EIS Raw Data

Chuck:
I do not understand what you are asking for exactly. Could you be more specific. The ranges are shown in the tables we provided to you in the January 24, 2020 memorandum analyses of the CRSO-EIS alternatives and the PA. The water travel times and PITPH and the proportion transported are in that memorandum also. Each of the tables in the January 24, 2020 memorandum show the average for each metric and the ranges in parentheses. Table 6, juvenile survival for chinook and steelhead, Table 7, juvenile fish travel time for chinook and steelhead, Table 8, ocean survival rates for chinook and steelhead, averages and ranges in parentheses. Table 9, SARs for chinook

and steelhead averages and ranges in parentheses. Table 10, Transport: In-river ratios, average with ranges in parentheses. We have already provided these to you on January 24. 2020.

Michele

Thanks
Michele

-----Original Message-----
From: Chamberlain, Charles B CIV USARMY CENWW (USA) [mailto:Charles.B.Chamberlain@usace.army.mil]
Sent: Thursday, March 12, 2020 11:50 AM
To: Michele Dehart <mdehart@fpc.org>
Cc: Sweet,Jason C (BPA) - PGB-5 <jcsweet@bpa.gov>
Subject: CRSO EIS Raw Data

Michele,

We have been getting comments that we have not adequately shown the range of modeled effects for the fish effects models used in the DEIS. Consequently, we would like to get a copy of the raw data for the 80 year water record from the CSS team. We would like these data for each of the metrics you provided. Please let me know if you have any questions or need additional information.

Charles Chamberlain
Biologist
US Army Corps of Engineers
Walla Walla District
201 North 3rd Avenue
Walla Walla, WA 99362
509-527-7298

From: Michele Dehart

Sent: Tue Apr 30 11:12:03 2019

To: Doumbia,Julie A (BPA) - EC-5; Hauser,Tracy L (BPA) - EWL-4

Cc: Chuck Chamberlain (NWW); Sue Camp (scamp@usbr.gov); Thomas C. Christian; Annie Kilburg

Subject: [EXTERNAL] RE: CSS modeling of CRSO EIS alternatives

Importance: Normal

Julie:

Please send the CSS modeling of CRSO EIS alternatives memo to the members of the Fish Technical Team. I do not have a list of all of the members nor their email addresses.

Michele DeHart, Manager

The Fish Passage Center

From: Doumbia,Julie A (BPA) - EC-5 [mailto:jadoumbia@bpa.gov]
Sent: Monday, April 29, 2019 5:21 PM
To: Michele Dehart; Hauser,Tracy L (BPA) - EWL-4
Cc: Chuck Chamberlain (NWW); Sue Camp (scamp@usbr.gov); Thomas C. Christian; Annie Kilburg
Subject: RE: CSS modeling of CRSO EIS alternatives

Hello Michele,

Thank you for sending your CSS analysis, we will review and begin integrating your results into the draft EIS documentation and get back to you with any critical questions.

Also, are you or your modeling team available to present your CSS results on the morning of May 29th, along with the other CRSO fish modeling groups? The debrief on May 29th is specific to MO2/MO3, but it's fine if you're available and can present your results on all four alternatives relative to the No Action Alternative since this will be the first time you would have your results debrief. This is not required, but it is a good opportunity to present your results to the broader CRSO fish team and have the opportunity for Q&A directly from them.

Thank you again,

Julie

From: Michele Dehart [mailto:mdehart@fpc.org]
Sent: Monday, April 29, 2019 3:36 PM
To: 'ED.Bowles@state.or.us'; Tucker Jones (tucker.a.jones@state.or.us); Garrity, Michael D (DFW) (Michael.Garrity@dfw.wa.gov); 'Bill Tweit (tweitwmt@dfw.wa.gov)'; 'Rob Lothrop (lotr@critfc.org)'; lance Hebdon; Doumbia,Julie A (BPA) - EC-5; Chuck Chamberlain (Charles.B.Chamberlain@usace.army.mil); Steve_Haeseker@fws.gov; Rawding, Daniel J (DFW) (Daniel.Rawding@dfw.wa.gov); Adam Storch (adam.j.storch@state.or.us); Robert Lessard (LESR@critfc.org); Hauser,Tracy L (BPA) - EWL-4; Tom Iverson

(t.k.iverson@comcast.net); Art Martin; Jay Hesse (jayh@nezperce.org); Kiefer,Russell (russ.kiefer@idfg.idaho.gov); 'Tom Lorz (lort@critfc.org)'; tim.copeland@idfg.idaho.gov
Cc: Randy Fisher (RFisher@psmfc.org); Jerry McCann; Brandon Chockley; Bobby Hsu; Gabriel Scheer; Erin Cooper
Subject: [EXTERNAL] CSS modeling of CRSO EIS alternatives

Julie and Chuck and Tracy:

Attached are the results of CSS modelling analyses of all of the CRSO EIS operations alternatives compared to the No Action Alternative.

The CSS Oversight Committee and the Fish Passage Center, agreed to utilize CSS methodologies to analyze the CRSO EIS operation alternatives and provide results to the CRSO Fish Technical Team by April 29, 2019.

These analyses are based upon the 80 year water record data sets provided to the Fish Passage Center by BPA and the USACOE.

Michele DeHart, Manager

The Fish Passage Center

From: Michele Dehart

Sent: Tue Jul 16 08:43:15 2019

To: Doumbia,Julie A (BPA) - EC-5

Subject: [EXTERNAL] upper Columbia

Importance: Normal

Hello Julie:

(b) (5)

[redacted]

Michele

From: Doumbia,Julie A (BPA) - EC-5 [mailto:jadoumbia@bpa.gov]
Sent: Monday, July 15, 2019 3:26 PM
To: Michele Dehart
Subject: RE: please final

Hello Michele,

(b) (5) [redacted]

Thanks,

Julie

From: Michele Dehart [mailto:mdehart@fpc.org]
Sent: Friday, July 12, 2019 3:52 PM
To: Doumbia,Julie A (BPA) - EC-5
Subject: [EXTERNAL] FW: please final

Hello Julie:

(b) (5) [redacted]

Call if you have questions.

Michele

From: Doumbia,Julie A (BPA) - EC-5

Sent: Tue Jul 16 13:31:32 2019

To: Michele Dehart

Cc: Chuck Chamberlain (NWW); Sue Camp (scamp@usbr.gov)

Subject: RE: upper Columbia

Importance: Normal

Great, thanks Michele.

(b) (5) [redacted]

Thanks very much again for the quick responses,

Julie

From: Michele Dehart [mailto:mdehart@fpc.org]
Sent: Tuesday, July 16, 2019 8:43 AM
To: Doumbia,Julie A (BPA) - EC-5
Subject: [EXTERNAL] upper Columbia

Hello Julie:

(b) (5)
[redacted]

Michele

From: Doumbia,Julie A (BPA) - EC-5 [mailto:jadoumbia@bpa.gov]

Sent: Monday, July 15, 2019 3:26 PM
To: Michele Dehart
Subject: RE: please final

Hello Michele,

(b) (5)
[redacted]

Thanks,

Julie

From: Michele Dehart [mailto:mdehart@fpc.org]
Sent: Friday, July 12, 2019 3:52 PM
To: Doumbia,Julie A (BPA) - EC-5
Subject: [EXTERNAL] FW: please final

Hello Julie:

(b) (5)

[redacted]

Call if you have questions.

Michele

From: Michele Dehart

Sent: Mon Apr 01 11:51:59 2019

To: Doumbia,Julie A (BPA) - EC-5; Thomas C. Christian

Cc: Susan Camp BOR; 'Chamberlain, Charles B CIV USARMY CENWW (US)'; Annie Kilburg

Subject: [EXTERNAL] RE: CRSO March 19 Anadromous Fish Modeling Meeting DRAFT Summary, Presentations, and Recording

Importance: Normal

Hello Julie:

(b) (5) [redacted]

Michele

From: Doumbia,Julie A (BPA) - EC-5 [mailto:jadoumbia@bpa.gov]
Sent: Monday, April 01, 2019 8:53 AM
To: Thomas C. Christian; Michele Dehart
Cc: Susan Camp BOR; 'Chamberlain, Charles B CIV USARMY CENWW (US)'; Annie Kilburg
Subject: RE: CRSO March 19 Anadromous Fish Modeling Meeting DRAFT Summary, Presentations, and Recording

Hello Michele,

[redacted]

Sincerely,

Julie

From: Thomas C. Christian [mailto:tchristian@triangleassociates.com]
Sent: Monday, March 25, 2019 5:06 PM

To: Michele Dehart
Cc: Susan Camp BOR; 'Chamberlain, Charles B CIV USARMY CENWW (US)'; Doumbia,Julie A (BPA) - EC-5; Annie Kilburg
Subject: [EXTERNAL] RE: CRSO March 19 Anadromous Fish Modeling Meeting DRAFT Summary, Presentations, and Recording

Hi Michele,

Thanks for your email. I have cc'd Julie, Chuck, and Sue and hopefully they can respond to you about the status of the draft EIS structure/outline document.

Thank you,

Thomas

From: Michele Dehart <mdehart@fpc.org>
Sent: Monday, March 25, 2019 1:32 PM
To: Thomas C. Christian <tchristian@triangleassociates.com>
Subject: RE: CRSO March 19 Anadromous Fish Modeling Meeting DRAFT Summary, Presentations, and Recording

Hello Thomas:

(b) (5) [redacted]

Thank You

Michele DeHart, Manager

The Fish Passage Center

From: Thomas C. Christian [mailto:tchristian@triangleassociates.com]
Sent: Friday, March 22, 2019 11:52 AM
To: Rich Zabel (NOAA Federal); 'jim.faulkner@noaa.gov'; Daniel Widener - NOAA Affiliate; 'cpaulsen@paulsenenvironmentalresearch.com'; 'gosselin@uw.edu'; 'jjand@uw.edu'; 'nickbeer@u.washington.edu'; Michele Dehart; 'bgkoehler@bpa.gov'
Cc: Adam J Storch (ODFW); 'alatta@mac.com'; Andy Kohler; Annalise Ritter; Art Martin; Bettin,Scott W (BPA) - EWP-4; Biegel,Sarah T (BPA) - ECP-4; Bill Towey; Bob Rose; bob@usrtf.org; Brad Eppard (NWD); Brent Hall (CTUIR); Brian Gruber; Brian Marotz (Montana) ; Candice @Reclamation; Chad Colter; Chris Pinney (NWW); Christine Golightly (CRITFC); Petersen,Christine H (BPA) - EWP-4; 'Christopher.A.Peery@usace.army.mil'; Chuck Brushwood; Chuck Chamberlain (NWW); Claudeo Broncho; Conor Giorgi (Spokane Tribe); Dan Stone; Dave Johnson (NPT); Deane Osterman (Kalispel); Eric Rothwell (erothwell@usbr.gov); 'Fielding, Scott D CIV (US'; Fryer, Derek S CIV CENWW CENWD (US); Gary James (CTUIR); Hadley, Hannah F CIV USARMY CENWS (US); Heironimus, Laura B (DFW); Jason Kesling; Jay Hesse (NPT); Jim Fredericks (IDFG); Joe Maroney (Kalispel); 'John.d.hook@usace.army.mil'; Johnathan Ebel (ShoBans); 'jonathan.g.rerecich@usace.army.mil'; Josie Thompson - NOAA Federal; Keith Hatch (BIA); Kirk Truscott; Lance Hebdon (IDFG); Laurie Porter (CRITFC); lesr@critfc.org; Lopez-Johnston,Siena M (BPA) - EWM-4; Malliris,Elizabeth A (CONTR) - PSR-6; Mark Bagdovitz; Marxen, Sara C CIV USARMY CENWS (US); Matt Boyer (Montana); Michael Garrity (WDFW); Michael Karnosh (Grande Ronde); Mickelson, Kristian E CIV USARMY CENWS (US); mike.edmondson@osc.idaho.gov; 'nancy.c.gleason@usace.army.mil'; Neuenhoff, Rachel D NWP; Nicole Ulacky; Norton, Joseph A III CIV (US); Olaf Langness (WDFW); Paul Kline (IDFG); Pozarycki, Scott V CIV USARMY CENWS (US); Quinn, Aaron T CIV USARMY CENWO (US); Randy Friedlander; Ricardo Walker (NWP); 'richard.m.piaskowski@usace.army.mil'; Rob Lothrop (CRITFC); Ida M. Royer; Rudy Salakory; Russ Kiefer (IDFG); Ryan Laughery (NWW); 'Scott Hauser'; Shawn Young (young@kootenai.org); Sheri Sears (FNW); Shutters, Marvin K CIV USARMY CENWW (US); Smith,Gregory M (BPA) - EWP-4; 'Sonja Kokos'; Steve Parker (YN); Steve Schlenker (NWP);

'Steve.d.juhnke@usace.army.mil'; Studebaker, Cynthia A NWP; Sue Camp (Reclamation); Sue Ireland; Tom Iverson; Tom Lorz (CRITFC); Tom Skiles (CRITFC); Tucker Jones; Weiss, Rebecca J CIV USARMY CENWD (US); Whorley, Kasi A CIV USARMY CENWD (USA); Doumbia,Julie A (BPA) - EC-5; Annie Kilburg; Joy Juelson; Simone Barley-Greenfield
Subject: CRSO March 19 Anadromous Fish Modeling Meeting DRAFT Summary, Presentations, and Recording

Hello Modelers and Anadromous Fish Team members,

Please find attached the draft summary and presentations from the Marth 19 anadromous fish modeling meeting. Here is the link to the webex recording:
https://triangleassociates.my.webex.com/recordingservice/sites/triangleassociates.my/recording/playback/a17b89f08e264c579984468183b8acf0

Please let me know if you have questions or comments.

Thomas

Thomas Christian
Project Associate
Triangle Associates, Inc.

811 1st Ave, Ste. 255

Seattle, WA 98104

Offices in WA | OR | MT

Office: (206) 583-0655 x131 | Cell: (b) (6) [redacted]

tchristian@triangleassociates.com
www.triangleassociates.com

Follow Triangle on **Facebook** and **LinkedIn**

From: Doumbia,Julie A (BPA) - EC-5

Sent: Mon Jul 15 15:25:46 2019

To: Michele Dehart

Subject: RE: please final

Importance: Normal

Hello Michele,

(b) (5) [redacted]

Thanks,

Julie

From: Michele Dehart [mailto:mdehart@fpc.org]

Sent: Friday, July 12, 2019 3:52 PM
To: Doumbia,Julie A (BPA) - EC-5
Subject: [EXTERNAL] FW: please final

Hello Julie:

[redacted] (b) (5)

Call if you have questions.

Michele

From: Michele Dehart

Sent: Thu Sep 12 11:11:52 2019

To: Julie Doumbia (jadoumbia@bpa.gov)

Subject: [EXTERNAL] request

Importance: Normal

Julie:

Please send me the email list for the entire Fish Technical Team, in the CRSO-EIS.

Thank You

Michele DeHart, Manager

The Fish Passage Center

503-833-3901

From: Doumbia,Julie A (BPA) - EC-5

Sent: Fri Jun 28 15:02:20 2019

To: Michele Dehart

Subject: Re: [EXTERNAL] FW: CSRO Document

Importance: Normal

Great, thank you again for reviewing, Michele!

Julie

On Jun 28, 2019 1:47 PM, Michele Dehart <mdehart@fpc.org> wrote:

Hello Julie:

Attached are our comments on the portion of draft Chapter 3 of the CRSO EIS, which you provided for review on June 24.

Please do not hesitate to call if you have any questions.

Thank You for the opportunity to review the draft.

Michele DeHart, Manager

From: Doumbia,Julie A (BPA) - EC-5

Sent: Sun Jul 07 21:07:56 2019

To: Michele Dehart

Subject: RE: REVIEW REQUESTED BY JULY 12: SR Steelhead modeling

Importance: Normal

Hi Michele,

[redacted] (b) (5)

Julie

From: Doumbia,Julie A (BPA) - EC-5
Sent: Sunday, July 07, 2019 8:57 PM
To: 'Daniel Widener - NOAA Affiliate'; 'James Faulkner - NOAA Federal'; 'Michele Dehart'; 'Rich Zabel - NOAA Federal'
Cc: Chuck Chamberlain (NWW); Sue Camp (scamp@usbr.gov); Petersen,Christine H (BPA) - EWP-4; Hauser,Tracy L (BPA) - EWL-4

Subject: RE: REVIEW REQUESTED BY JULY 12: SR Steelhead modeling

Hello Fish Modelers,

[redacted]

Thanks very much again everyone,

Julie

From: Doumbia,Julie A (BPA) - EC-5

Sent: Wednesday, July 03, 2019 8:45 AM
To: 'Daniel Widener - NOAA Affiliate'; 'James Faulkner - NOAA Federal'; 'Michele Dehart'; 'Rich Zabel - NOAA Federal'
Cc: Chuck Chamberlain (NWW); Sue Camp (scamp@usbr.gov); Petersen,Christine H (BPA) - EWP-4; Hauser,Tracy L (BPA) - EWL-4
Subject: REVIEW REQUESTED BY JULY 12: SR Steelhead modeling

Hello Fish Modelers,

[redacted]

(b) (5)

(b) (5)

[redacted]

Thank you all again,

Julie

From: Doumbia,Julie A (BPA) - EC-5
Sent: Friday, June 28, 2019 11:53 AM
To: 'Daniel Widener - NOAA Affiliate'; 'James Faulkner - NOAA Federal'; 'Michele Dehart'; 'Rich Zabel - NOAA Federal'
Cc: Chuck Chamberlain (NWW); Sue Camp (scamp@usbr.gov); Petersen,Christine H (BPA) - EWP-4; Hauser,Tracy L (BPA) - EWL-4
Subject: REMINDER: REVIEW REQUESTED BY JUNE 28: SR Sp/Su Chinook modeling

Hello Fish Modelers,

(b) (5) [redacted]

Thank you all again!

Julie

From: Doumbia,Julie A (BPA) - EC-5
Sent: Monday, June 24, 2019 8:38 AM
To: Daniel Widener - NOAA Affiliate; James Faulkner - NOAA Federal; Michele Dehart; Rich Zabel - NOAA Federal
Cc: Chuck Chamberlain (NWW); Sue Camp (scamp@usbr.gov); Petersen,Christine H (BPA) - EWP-4; Hauser,Tracy L (BPA) - EWL-4
Subject: REVIEW REQUESTED BY JUNE 28: SR Sp/Su Chinook modeling

Hello Fish Modelers,

[redacted] (b) (5)

(b) (5)

[redacted]

[redacted]

Thank you all very much again for reviewing under tight timeline this week, we really appreciate it.

Julie

Julie Doumbia

Environmental Protection Specialist

Bonneville Power Administration
bpa.gov | P 503-230-7641 | C [redacted]

From: Doumbia,Julie A (BPA) - EC-5

Sent: Thu May 16 08:28:25 2019

To: Michele Dehart; Wickham, Ross S CIV (US); Buccola, Norman L (Norm) CIV USARMY CENWP (USA)

Cc: Brandon Chockley

Subject: RE: H&H data sets for CRSO analyses (UNCLASSIFIED)

Importance: Normal

Hello Michele,

(b) (5) [redacted]

Thank you again,

Julie

-----Original Message-----
From: Michele Dehart [mailto:mdehart@fpc.org]
Sent: Wednesday, May 15, 2019 1:14 PM
To: Wickham, Ross S CIV (US); Buccola, Norman L (Norm) CIV USARMY CENWP (USA)
Cc: Doumbia,Julie A (BPA) - EC-5; Brandon Chockley
Subject: [EXTERNAL] RE: H&H data sets for CRSO analyses (UNCLASSIFIED)

Hello Ross:
We tried the ARL safe option twice today. Thank You for sending it. However, it is telling us that the user ID or password you sent us does not work.
Can you try it again, it seems like a glitch.
Thank You

Michele

-----Original Message-----
From: Wickham, Ross S CIV (US) [mailto:Ross.S.Wickham@usace.army.mil]
Sent: Wednesday, May 15, 2019 9:29 AM
To: Michele Dehart; Buccola, Norman L (Norm) CIV USARMY CENWP (USA)
Cc: Julie Doumbia; Brandon Chockley
Subject: RE: H&H data sets for CRSO analyses (UNCLASSIFIED)

CLASSIFICATION: UNCLASSIFIED

Michele,

Yes, expect an email soon with instructions to download data using our ARL safe data transfer.

Ross

Ross Wickham, P.E.
USACE Walla Walla
Hydrology Branch
509-527-7569

-----Original Message-----
From: Michele Dehart [mailto:mdehart@fpc.org]
Sent: Wednesday, May 15, 2019 08:45 AM
To: Wickham, Ross S CIV (US) <Ross.S.Wickham@usace.army.mil>; Buccola, Norman L (Norm) CIV USARMY CENWP (USA) <Norman.L.Buccola@usace.army.mil>
Cc: Julie Doumbia <jadoumbia@bpa.gov>; Brandon Chockley <bchockley@fpc.org>
Subject: [Non-DoD Source] RE: H&H data sets for CRSO analyses (UNCLASSIFIED)

Hello Ross:
Thank You for your response, but the attachment did not get through the USACOE security. This is the message we received instead of the data files:

A MIME attachment of type <application/octet-stream> was removed here by a drop-attachments-by-name filter rule on the host <gw8.usace.army.mil>.

Is there some other way to get those data files?
Michele

-----Original Message-----
From: Wickham, Ross S CIV (US) [mailto:Ross.S.Wickham@usace.army.mil]
Sent: Tuesday, May 14, 2019 10:21 PM
To: Michele Dehart; Buccola, Norman L (Norm) CIV USARMY CENWP (USA)
Cc: Julie Doumbia; Brandon Chockley
Subject: RE: H&H data sets for CRSO analyses (UNCLASSIFIED)

CLASSIFICATION: UNCLASSIFIED

Hi Michele,

(b) (5) [redacted]

Ross

Ross Wickham, P.E.
USACE Walla Walla
Hydrology Branch
509-527-7569

-----Original Message-----
From: Michele Dehart [mailto:mdehart@fpc.org]
Sent: Tuesday, May 14, 2019 15:18 PM
To: Buccola, Norman L (Norm) CIV USARMY CENWP (USA) <Norman.L.Buccola@usace.army.mil>
Cc: Julie Doumbia <jadoumbia@bpa.gov>; Wickham, Ross S CIV (US) <Ross.S.Wickham@usace.army.mil>
Subject: [Non-DoD Source] RE: H&H data sets for CRSO analyses (UNCLASSIFIED)

(b) (5) [redacted]

Thanks for your help with this question.
Michele

-----Original Message-----
From: Buccola, Norman L (Norm) CIV USARMY CENWP (USA) [mailto:Norman.L.Buccola@usace.army.mil]
Sent: Tuesday, May 14, 2019 2:51 PM
To: Michele Dehart
Cc: Julie Doumbia; Wickham, Ross S CIV (US)
Subject: RE: H&H data sets for CRSO analyses (UNCLASSIFIED)

CLASSIFICATION: UNCLASSIFIED

Michele,
[redacted] (b) (5)

Thanks

Norman Buccola
Water Quality Engineer
U. S. Army Corps of Engineers Portland District
503-808-4837
Norman.Buccola@usace.army.mil

-----Original Message-----
From: Michele Dehart [mailto:mdehart@fpc.org]
Sent: Monday, May 13, 2019 2:30 PM
To: Buccola, Norman L (Norm) CIV USARMY CENWP (USA) <Norman.L.Buccola@usace.army.mil>
Cc: Julie Doumbia <jadoumbia@bpa.gov>
Subject: [Non-DoD Source] H&H data sets for CRSO analyses

Hello Norman:

[redacted] (b) (5)

(b) (5) [redacted]

Thanks

Michele DeHart, Manager

The Fish Passage Center

CLASSIFICATION: UNCLASSIFIED
CLASSIFICATION: UNCLASSIFIED
CLASSIFICATION: UNCLASSIFIED

From: Michele Dehart

Sent: Fri Oct 30 15:21:42 2020

To: Hauser,Tracy L (BPA) - EWL-4

Cc: lessard@critfc.org; Jerry McCann; Jonathan Ebel; tim.copeland@idfg.idaho.gov; Adam J Storch; Steve_Haeseker@fws.gov

Subject: [EXTERNAL] RE: ISAB Review of the Comparative Survival Study (CSS) Draft 2020 Annual Report

Importance: Normal

Hi Tracy:

Each year the ISAB reviews the CSS draft report and makes detailed comments and also suggests, further analyses and topics to pursue. We attempt to pursue the recommendations from the ISAB within the limited funding available for the project. We can not do everything because of funding constraints. Every year we respond to the ISAB in writing. We respond to each of their comments and explain how we addressed their comments in the reports. We attach the response as an appendix to the final report. The CSS strives to address the prevailing passage management questions facing the regional managers. An example of this was our total change of direction to complete the CRSO-EIS analyses. Because we have limited funding and limited staff we are forced to prioritize. The agencies and tribes' representatives on the CSS Oversight Committee and FPC will discuss the recommendations by the ISAB during our response to comments. If there is agreement and it is determined to be doable, we will implement new analyses in next years' report.

As you know we respond in the same way to all comments we receive on draft CSS Annual reports. Feel free to circulate this response to the BPA Fish and Wildlife Managers that were on the original recipient email list.

Please let me know, if you have questions

Michele DeHart, Manager

The Fish Passage Center

503-833-3901

From: Hauser,Tracy L (BPA) - EWL-4 <tlhauser@bpa.gov>
Sent: Friday, October 30, 2020 12:06 PM
To: Michele Dehart <MDehart@fpc.org>
Subject: FW: ISAB Review of the Comparative Survival Study (CSS) Draft 2020 Annual Report

Hi Michele

I saw the ISAB review on the CSS report and their recommendations. Will you be implementing this in the upcoming report or append to the draft 2020?

><((((*>   ><((((*>   ><((((*>

Tracy L. Hauser, F&W Project Mgr

From: Donahue,Scott L (BPA) - EWP-4 <sldonahue@bpa.gov>
Sent: Friday, October 30, 2020 11:20 AM
To: All F&W Project Managers <FWPROJMGR@BPASite1.bpa.gov>; Sweet,Jason C (BPA) - PGB-5 <jcsweet@bpa.gov>
Subject: FW: ISAB Review of the Comparative Survival Study (CSS) Draft 2020 Annual Report

Team,

Sharing this as an FYSA.

Have a great and safe weekend!

Scott

From: Erik Merrill <emerrill@nwcouncil.org>
Sent: Friday, October 30, 2020 12:01 AM
To: Council Members <CouncilMembers@NWCouncil.org>; Jaime Pinkham <jpinkham@critfc.org>; Zach Penney (zpenney@critfc.org) <zpenney@critfc.org>; kevin.werner@noaa.gov; Mike.Ford@noaa.gov; Fish-Division Plus

<FishDivisionPlus@NWCouncil.org>; Fish-State Staff <FishStateStaff@NWCouncil.org>
Cc: Donahue,Scott L (BPA) - EWP-4 <sldonahue@bpa.gov>; Gregory, Stanley Vincent
<stanley.gregory@oregonstate.edu>
Subject: [EXTERNAL] ISAB Review of the Comparative Survival Study (CSS) Draft 2020 Annual Report

ISAB Administrative Oversight Panel

- Richard Devlin, Chair, Northwest Power and Conservation Council
- Jaime Pinkham, Executive Director, Columbia River Inter-Tribal Fish Commission
- Kevin Werner, Science Director, NOAA-Fisheries Northwest Fisheries Science Center

The Columbia River Basin Fish and Wildlife Program calls for a regular system of independent and timely science reviews of the Fish Passage Center's (FPC) analytical products. These reviews include evaluations of the Comparative Survival Study's (CSS) draft annual reports. This ISAB review of the draft 2020 CSS Annual Report is the ISAB's eleventh review of CSS annual reports. CSS reports have thoroughly documented trends in survival and productivity, and these long-term data become more valuable with each additional year.

The annual CSS report is a mature product, produced by the Fish Passage Center since 1998 and reviewed by the ISAB since 2010. The reports typically include mostly updates with the latest year of data, continuation of the analysis of long-term trends, and addition of new analytical approaches. As more data are acquired, new patterns and questions arise on the interpretation of the results—this is now the primary focus of our reviews.

A few key observations from this year's ISAB review include:

- This CSS Annual Report includes 25 years of smolt-to-adult return (SAR) data for wild Snake River spring/summer Chinook salmon (1994–2018). Averaged values calculated over time series change very little because the additional year of data represents a small fraction of the total record. For most chapters, the final conclusions are similar to conclusions in previous reports. However, many things have changed in the system over the 25 years of data collection and the impacts of these changes on the long-term analyses are complex. Many of the changes in the system are summarized in Chapter 1, but the reader must infer possible impacts. The ISAB recommends the CSS to develop a table of the changes in the system over the years and a brief description of possible impacts of these changes on salmon and steelhead survival.

- Chapter 2 includes a first analysis of the patterns of survival of wild steelhead in the Basin. The life history of steelhead is more complex than the life histories of Pacific salmon, and a more thorough explanation is warranted of the consequences of steelhead life histories on the analysis and associated assumptions. Comparison of survival among the stocks that share similar migration routes may increase our understanding of factors related to steelhead survival.
- Chapter 3 expands analyses of the effects of the in-river environment on juvenile travel time, instantaneous mortality, and survival. The CSS could consider a more detailed evaluation of differences detected in these variables across individual reaches to reveal factors that may affect survival.
- Chapter 4 also extends the ongoing analysis of long-term patterns in annual overall SARs. By now, the low level of SARs relative to the Council's 2%-6% objectives has been well documented. These essential but lengthy data sets and extensive summaries of results may overwhelm decision makers and the public, inadvertently giving the impression that persistently low values of SARs are inevitable. In the long term, this can desensitize them to the potential consequences and relative effectiveness of alternative management actions that can better achieve the Council's SAR objectives. The life cycle models of CSS and NOAA Fisheries rely on these estimates and provide important syntheses. In addition, the CSS could develop an Impact Report collectively with other groups to communicate the most critical take-home messages for the Council, BPA, and co-managers.
- Chapter 5 continues the analyses of SARs and productivity. The ISAB suggests a number of approaches to strengthen this analysis.
- Finally, Chapter 6 presents a work in progress on the analysis of spring Chinook upstream migration success. All survival probability estimates are very high, and the lack of contrast in survival in many reaches over time will make it difficult to determine effects of different factors. The CSS could clearly identify the ultimate application of this analysis and highlight alternative management actions and their potential impacts on Chinook survival.

Since 2011, the ISAB has suggested topics that warrant further CSS or regional review. The following are some of the topics recommended in 2020 for future reports:

- Given the large amount of information in the CSS reports and similarity of the reports, it would be helpful to have an introductory section that highlights 1) an overall summary for the survival of salmon and steelhead survival and how the SARs for the year compare to the long-term means, 2) new analyses in the report, 3) major changes that signal emerging management concerns, and 4) recommendations for management of the hydrosystem that potentially alter or reinforce previous decisions.

- The CSS could identify ways to address the spatial and temporal aspects of the effects of total dissolved gas (TDG) on acute and long-term survival.

The ISAB appreciates the CSS's detailed responses to suggestions provided in previous reviews. The ISAB's full report contains an overview of the draft 2020 CSS report's findings, suggested topics for further CSS review, and general comments and specific editorial suggestions on each chapter of the draft 2020 CSS report.

The ISAB's detailed report is posted (ISAB 2020-2) and available as a Word document in BOX (link).

Stay well,

Stan Gregory, ISAB Chair

and

Erik Merrill

Independent Science Manager

Northwest Power and Conservation Council

503-222-5161

800-452-5161

From: Doumbia,Julie A (BPA) - EC-5

Sent: Tue Jun 18 12:30:44 2019

To: Michele Dehart

Subject: RE: julie doumbia questions responses

Importance: Normal

Great, thank you again – Julie

From: Michele Dehart [mailto:mdehart@fpc.org]
Sent: Tuesday, June 18, 2019 12:27 PM
To: Doumbia,Julie A (BPA) - EC-5
Cc: Chuck Chamberlain (NWW); Sue Camp (scamp@usbr.gov)
Subject: [EXTERNAL] RE: julie doumbia questions responses

Julie:

We will try to turn it around as fast as possible

Michele

From: Doumbia,Julie A (BPA) - EC-5 [mailto:jadoumbia@bpa.gov]
Sent: Tuesday, June 18, 2019 12:22 PM

To: Michele Dehart
Cc: Chuck Chamberlain (NWW); Sue Camp (scamp@usbr.gov)
Subject: RE: julie doumbia questions responses

Thank you for sending, Michele – we appreciate it especially coming in before the final June 21st date, thank you.

[redacted] (b) (5)

Thank you again!

Julie

From: Michele Dehart [mailto:mdehart@fpc.org]
Sent: Friday, June 14, 2019 2:44 PM
To: Doumbia,Julie A (BPA) - EC-5; Chuck Chamberlain (Charles.B.Chamberlain@usace.army.mil)
Cc: Adam Storch (adam.j.storch@state.or.us); Steve_Haeseker@fws.gov; Robert Lessard (LESR@critfc.org); 'Rob Lothrop (lotr@critfc.org)'; tim.copeland@idfg.idaho.gov; Rawding, Daniel J (DFW) (Daniel.Rawding@dfw.wa.gov); Art Martin; Jay Hesse (jayh@nezperce.org); Tom Iverson (t.k.iverson@comcast.net); Jerry McCann; Brandon Chockley; Bobby Hsu; Gabriel Scheer; Erin Cooper; Garrity,

Michael D (DFW) (Michael.Garrity@dfw.wa.gov)
Subject: [EXTERNAL] FW: julie doumbia questions responses

Julie:

(b) (5) [redacted]

Best Regards

Michele DeHart, Manager

The Fish Passage Center

From: Mote,Khanida P (BPA) - NSSP-4

Sent: Tue Sep 17 13:08:47 2019

To: Hauser,Tracy L (BPA) - EWL-4; mdehart@fpc.org; Pam Kahut (PKahut@psmfc.org)

Cc: Skidmore,John T (BPA) - EWL-4; Cochenour,William M (BPA) - NSSP-4

Subject: OK-Thanks Y'all! RE: FPC contract plan (MA 46273-00010) PSMFC (CRSO WE-Extension)

Importance: Normal

That sounds like an awesome plan to me as well!

Thanks, Tracy/Michele/Pam, for your hard work and cooperation regarding the work under Rel. 00010!!!

Khanida P. Mote, C.P.M.

Contracting Officer

Bonneville Power Administration

Supply Chain Sourcing Services (NSSP-4)

PO Box 3621/905 NE 11th Avenue

Portland, Oregon 97208

Ph: 503-230-4599; Email: kpmote@bpa.gov

Fax: 503-230-4508;

From: Hauser,Tracy L (BPA) - EWL-4
Sent: Tuesday, September 17, 2019 11:28 AM
To: mdehart@fpc.org; Pam Kahut (PKahut@psmfc.org); Mote,Khanida P (BPA) - NSSP-4
Cc: Skidmore,John T (BPA) - EWL-4
Subject: FPC contract plan

Hello All

Just wanted to follow up with an email regarding my conversation with Michele this morning for our plan going forward for the no cost time extension amendment and the 12 month 2020 contract CR 335830.

Based on spending and close out de-ob's for last couple of years, we are not going to add any 2020 funds to the 19 contract 78040 REL 10 extension. We are only extending WE F: CRSO EIS task for 3 months, all other tasks will not be extended, they will be captured under the 2020 contract.

According to contract balance reports:

2017 – had $110,388 left over

2018 – had $41,281 left over

2019 – has $664,391 remaining so far

Based on this information, WE F will be covered under the existing 19 funding through the 3 month extension without dipping into 20 funds. It gets too burdensome if we start splitting up the budget and then need to close out the 19 contract and de-ob the remaining $ and amend the 20 contract so it has enough funds (all of this administrative work will take time). To avoid this, we will just stick with a 12 month contract for 20 and go with the budget Michele provided.

Khanida assured me that BPA will cover any costs for work that BPA requests for WE F if it ends up needing funds, but I doubt that will be necessary based on past spending trends. This was shared with Michele during our conversation. And when I discussed this with Khanida she was supportive of our plan as well.

Michele will continue to provide CRSO EIS log on a weekly basis and the document will be uploaded under the 19 contract. I have added one milestone to WE F regarding the log as well as extending the dates on this WE. I will try to process the amendment tomorrow and finalize the 2020 CR and send this on as well.

Thanks all for your assistance. ~ Tracy

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Tracy L. Hauser, F&W Project Mgr cid:image001.png@01D3C808.E543B670

Bonneville Power Administration

Fish & Wildlife, Oregon Implementation

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P Please consider the **environment** before printing this e-mail

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From: Michele Dehart

Sent: Fri Apr 05 12:58:36 2019

To: Hauser,Tracy L - KEWL-4 (tlhauser@bpa.gov)

Subject: [EXTERNAL] FW: FPC workstatement 2018.

Importance: Normal

Tracy:

The cbfish change log says that the revised work element was added to the 2018 FPC work statement in August 2018. I remember that we did modify the 2017 -2018 work statement after meetings here at the FPC and that it was not in the original work statement that was finalized on December 2017. Should I use the modification date that is in cbfish or should I use the Dec 1, 2017 date that was the start of the contract period even though that work element was not included until the August modification?

Michele

From: Michele Dehart
Sent: Friday, April 05, 2019 11:28 AM
To: Hauser,Tracy L - KEWL-4 (tlhauser@bpa.gov)
Subject: FPC workstatement 2018.

Hello Tracy:

I have a question. Could you tell me the date in 2018 that the FPC work statement was modified to include a WE modification for technical support to the federal action agencies on analyzing the CRSO EIS alternatives. I think it was in March 2018, I am going through our records and will eventually find it, but I thought you might be able to tell me. All of that was followed by discussions of the non-disclosure agreement.

Michele