PLATTE RIVER RECOVERY IMPLEMENTATION PROGRAM (PRRIP or Program)
Governance Committee (GC) Quarterly Meeting Minutes

Meeting Location:
PRRIP Executive Director's Office Conference Room
4111 4th Avenue, Suite 6
Kearney, NE 68845
(308) 237-5728

Meeting Attendees

Governance Committee (GC) Table

State of Wyoming
Harry LaBonde – Voting Member
Brian Clerkin – Alternate

State of Colorado
Don Ament – Voting Member (GC Chair)
Carlee Brown – Alternate

State of Nebraska
Jeff Fassett – Voting Member
Jennifer Schellpeper – Alternate

Upper Platte Water Users
Dennis Strauch – Voting Member
Bob Mehling – Alternate

Downstream Water Users
Mark Czaplewski – Member
Brian Barels – Member
Don Kraus – Member
Kent Miller – Member

Executive Director's Office (EDO)
Jerry Kenny, ED
Jason Farnsworth
Scott Griebling
Bruce Sackett
Sira Sartori
Chad Smith
Kevin Werbylo

Bureau of Reclamation (Reclamation)
Chris Beardsley – Voting Member
Brock Merrill – Alternate

U.S. Fish and Wildlife Service (Service)
Michael Thabault – Voting Member (by phone)
Tom Econopouly – Alternate
Matt Rabbe – Alternate

Environmental Entities
Bill Taddicken – Voting Member
Rich Walters – Voting Member
Duane Hovorka – Member

Colorado Water Users
Alan Berryman – Voting Member
Deb Freeman – Alternate

Audience Members
David Galat – ISAC
Jim Hawks – City of North Platte
Brad Anderson – EDO Special Advisor
Russ Souchek – Nebraska Wildlife Federation
Jeff Cowley – Wyoming State Engineer's Office
Elizabeth Miller – NPNRD
Cory Steinke – CNPPID
Mike Drain – CNPPID
Dave Zorn – CNPPID
Jeff Runge – Service
Jim Jenniges – NPPD
Jim Schneider – Olsson Associates
Matt Pillard – HDR

TUESDAY, SEPTEMBER 13, 2016

Welcome & Administrative

Ament called the meeting to order at 1:58 PM Central Time. The group proceeded with introductions.

The GC approved the June 7-8, 2016; July 26-27, 2016; and August 17, 2016 GC minutes by unanimous consent.

Program Committee Updates

Land Advisory Committee (LAC)

Czaplewski provided an update on the latest LAC activities. The LAC last met via conference call on August 15, 2016. The single agenda item regarded Tract 1603 and the LAC recommended the GC pursue the tract. The tract sold at auction to a private individual.

Water Advisory Committee (WAC)

Steinke provided an update on the latest WAC activities. The WAC discussed the status of the J2 project, water leasing permits, CNPPID water leasing, Plan A and Plan B for Water Action Plan projects, broad scale recharge, slurry wall gravel pits, and a letter from the Tri-Basin NRD concerning the acquire and retire component.

Technical Advisory Committee (TAC)

Smith provided an update on the latest TAC activities. The TAC has not met since April and the next meeting will be in conjunction with the AMP Reporting Session in October. The TAC has provided electronic input on several items including draft PRRIP manuscripts for publication and the EDO's pallid sturgeon memo.

Finance Committee (FC)

LaBonde provided an update on the latest FC activities. The FC met twice since the June GC meeting. The first meeting on August 11 the FC approved two habitat complex bid packages, approved the fall disking RFQ, and held a second meeting on September 6 where the FC approved two contract amendments (broad-scale recharge permitting and sand dam removal modeling).

Program Outreach Update

PRESENTATIONS

- Kevin Werbylo presented *"Managing the Planform of the Central Platte River through Flow and Sediment Augmentation"* at the Rocky Mountain Stream Restoration Conference in Breckenridge, Colorado on July 20, 2016.
- Darren Beck presented *"Management of Channel Forming Storage Releases and Alluvial Recharge Projects for Habitat Restoration"* at the Rocky Mountain Stream Restoration Conference in Breckenridge, Colorado on July 20, 2016.

UPCOMING PRESENTATIONS/EXHIBITS/SPONSORSHIPS

- The Program is exhibiting at Husker Harvest Days in Grand Island on September 13, 14, and 15, 2016 in the Natural Resources Districts building. Husker Harvest Days is recognized as the World's Largest Totally Irrigated Working Farm Show™ and features the most extensive state-of-the-art information and technology available for today's agricultural producers.

- Patrick Farrell will be presenting at the Nebraska Natural Legacy Conference in Broken Bow, Nebraska on September 21, 2016. The title of his presentation is *Riverine habitat selection of Whooping Cranes during migration: Implications for managing habitat along the central Platte River*.
- Jerry Kenny and other EDO staff will be giving a tour of Program projects to the Upper Niobrara White Natural Resources District Board of Directors on September 24, 2016.
- The Program will be exhibiting at the Natural Resources Districts annual conference at the Younes Conference Center in Kearney, Nebraska on September 26 & 27, 2016.
- A series of basin-specific panels will look at water management in Nebraska at the Nebraska Water Center's annual water symposium on October 20, 2016. Speakers on the Lower Platte panel include Jerry Kenny of the Program, Don Kraus of the Central Nebraska Public Power and Irrigation District and Mace Hack of The Nature Conservancy.
- The Program will be exhibiting at the South Platte Forum on October 26 & 27, 2016 in Loveland, CO.

MEDIA/OTHER

- The Kearney Hub interviewed Jerry Kenny for an August 4, 2016 article on the J-2 reservoir being formally placed on hold by the Governance Committee.
- Mike Drain of the CNPPID, John Thorburn of Tri-Basin Natural Resources District, and Lyndon Vogt of Central Platte Natural Resources District were all interviewed for an August 4, 2016 Kearney Hub article on the effects of the J-2 hold on some of the project partners.
- The Kearney Hub did an August 20-21, 2016 feature on the Platte Basin watershed journey of Michael Forsberg and Pete Stegen which is part of the Platte Basin Timelapse Project. The duo traveled over 1,000 miles by biking, hiking, and canoeing from the mountain headwaters of the Platte in Colorado to Plattsmouth, Nebraska where the Platte joins the Missouri.

PRRIP FY16 Budget/Contracts Update

Kenny gave an overview of the status of the FY16 budget, related expenditures, contracts, and land income and taxes. Ament asked about farms owned by the Program. Sackett said they are generally all cash rent.

J-2 Reservoir Project

Kraus gave an update on the status of the J-2 Project. CNPPID and the EDO are working on agreement amendment language to pause the project. Kenny said the ball is now in the court of the Program attorneys. Czaplewski asked how many acres CNPPID has acquired. Steinke said in the range of 30-40 acres.

USFWS Items

Thabault discussed the final draft of the Service's Milestones Report. Rabbe discussed some of the changes to the report such as noting the J-2 Project is now on hold. Freeman said the explanatory material that accompanies the milestones are not milestones themselves. The way they are characterized as sub-components that have not been achieved is a little strong. Those items guide us but they are not failed components. Rabbe said the way the Service went about it was to add the language of "While not required…". Kenny said the EDO will work with the Service to make sure they have the information necessary to do proper reporting like incidental take, water reporting, and others. Barels asked if there will be a report or individual memos. Kenny said that is one of the things that needs to get sorted out.

Rabbe discussed the letters related to the Northern Long-Eared Bat (NLEB) informal consultation. The Service wrestled with the issue of clarifying tree size that might be considered habitat. They could not find an instance of being specific providing a size that would apply. The footnote definition used in the Service's response letter to Reclamation is consistent with how the Service has approached this issue with everyone

else. Freeman asked if this means there is no grubbing, clearing, or other activities. Rabbe said on a case-by-case basis the Program can come to the Service's office to talk about specific circumstances.

Rabbe discussed the Fall Flow Routing Test Release. The peak should be past Kearney now. We saw roughly 3,200 cfs at Overton and will see around 3,000 cfs at Grand Island. Runge said the idea for this came about during coordination discussions with the water users in the mid-2000's. The thought behind it is the canals are charged, losses would be less, so we can try a test release and see what the true losses are. Barels asked if there is monitoring in the river to see what is going on. Rabbe said there are gages in the river and mechanisms for tracking water. The purpose was not to track channel change or species response. Barels asked if it was just a hydraulic test. Rabbe said yes.

Barels asked the Service to use the EA Committee /Reservoir Coordinating Committee in developing future releases because people were impacted by this release and the communication was not broad enough for proper planning and responses. Rabbe and Thabault said that is noted and will be done in the future. Thabault asked for more clarification. Barels said there are groundwater recharge permits and other diversions that could be made at this time that were impacted by the test release. We had to change canal operating plans and shut them down to not operate for groundwater recharge. We are not yet sure if the EA water has passed and if those canals can be re-opened. Thabault said he will work with his staff on this.

Cook Tract Water Items

Drain discussed the methodology to get a score for the Cook Tract well. Sartori gave a presentation on the project background.

LaBonde moved to approve the score for the Cook Tract well; Berryman seconded. **Score approved.**

CNPPID Water Service Agreements (WSA)

Kenny discussed the WSAs for the Phelps Canal and Elwood Reservoir.

Barels moved to approve the one-year extension of the Water Service Agreements for Phelps Canal and Elwood Reservoir; Beardsley seconded. Kraus, Czaplewski, and Miller abstained. **Water Service Agreements approved.**

Water Action Plan Projects Update

Werbylo provided an update on general Water Action Plan projects, broad-scale recharge, and slurry wall pits and aquifers. Freeman asked if there are existing pits that could work for this. Sackett said there are very few that are available.

PRRIP 2016 EDO Technical Series

Farnsworth gave a presentation highlighting key points from the 2016 EDO Technical Series. Econopouly asked about the volume for the effective discharge. Farnsworth said it is not a volume approach but an integration of flow and sediment. Hovorka asked about the return interval. Farnsworth said that is under current flows. Runge asked about reverting to a dry period and the increase in disking. If we end up in a drier situation, what facilitates the increase in vegetation? Farnsworth said not having large bankfull or larger flows. Jenniges said the issue with vegetation is you can keep it out of the channel by keeping it wet, but if it establishes flow cannot remove it. Thabault asked if Farnsworth could speculate the level of support there is for the combination of flow and mechanical actions to get from one event to the next? Does a bankfull flow every three years help us get to the next 16-year event? Farnsworth said no, mechanical actions would still be required. Hovorka said phrag is now a noxious week and a problem the NET funding is it is not set up to deal with noxious week funding. The Program has a legal responsibility to control phrag

on Program lands. It's also very expensive and to expect that all landowners will do this control is a big ask. These are not easy issues to grapple with.

Public Comment

Ament asked for public comment. None offered.

Executive Session

Fassett moved to enter Executive Session; LaBonde seconded. **GC entered Executive Session at 4:58 PM Central Time.**

Berryman moved to end Executive Session; Beardsley seconded. **GC ended Executive Session at 5:30 PM Central Time.**

PRRIP Executive Session Motions

LaBonde moved to approve allowing the Nebraska Community Foundation to sign Land Use Agreements for Tracts 1008, 1228, 1604, and 1605 on behalf of the Program; Barels seconded. Walters abstained on the vote related to Tract 1228. **Land Use Agreements approved.**

Meeting adjourned at 5:31 PM Central Time.

WEDNESDAY, SEPTEMBER 14, 2016

Welcome and Administrative

Ament called the meeting to order at 8:02 AM Central Time. The group proceeded with introductions.

North Platte Choke Point

Anderson provided a presentation on the feasibility assessment of several options for the North Platte Choke Point. Taddicken asked if we looked at a model showing 5,000-7,000 cfs for inundation. Anderson said he looked at a gage height of 7 feet flood stage which is 4,000 cfs through the reach. The impact would be substantial at 7,000 cfs because the area is flat and those flows would be out of bank. Taddicken asked if we do Alternatives 2 and 3 does that add to the cfs we can get through the reach. Anderson we could convey 3,000 cfs through the area under the recommended construction alternative. Miller said the problem with the higher water levels is the impact to groundwater. When river stage is raised, groundwater levels are raised as well. Buying out properties doesn't take into consideration the properties impacted by the raising of the groundwater (water in crawl spaces, yards, driveways, etc.). Hawks agreed with Miller and said we have this problem even at 6 feet. The inundation map is fine but it does not reflect the true magnitude of the problem through the community. Miller said the only way to deal with the groundwater issue and perceptions of being flooded is to do something structurally (dredging or structure around the west end of North Platte). Hawks asked if you negotiate a document with the owner of the property and pay them, what would that instrument be and how does that devalue the property? Kenny said it would be a flood easement, Sackett said it would be filed in county records. Hawks asked if you could get that property insured. Sackett said you could not build a structure and get it insured. Anderson said this project won't have any impact on insurability of a structure because this is so much smaller than a 100-year flood event, which is the event that insurance is tied to. That would be well out of the banks. Farnsworth said it is about 25,000-30,000 cfs.

Kraus said you would have to get agreement with 28 individuals and that is a challenge. Farnsworth said we would have to get the same agreement if we decide to build something in the channel as well. Anderson said his suggestion is to determine the groundwater level today; Kenny said we have monitoring wells out now. The second thing would be we could consider drain systems around any properties that would be

subjected to problems from groundwater. The issue is there will be maintenance costs associated with pumping and that would add to the total expense. Kenny said we did another project in the area along North River Road and we improved drainage to Whitehorse Creek. Since then, there have been a couple high flow years and that has worked well. Drain said there have been times when river stage is up and there have been no recent rains and there are water problems from groundwater. Miller said don't dismiss any alternative yet based on costs because there may be additional costs that are not yet factored in.

Drain asked about the design of the canal and how it would function for its primary purpose (designed for 2,000 cfs, carrying only 200 cfs for irrigation). Anderson said we can't have a dual structure, the existing canal would have to stay so there would need to be parallel canals. Farnsworth asked if we have a list of complaints from this summer when flows were over 3,000 cfs in June. Hawks said no but he could tell you who they are based on 30 years of experience. Kenny said clearly there are some groundwater items that need investigated and come back to the GC with more information. Merrill asked if we will have the same groundwater impact if we do something like the channel dredging. Anderson said yes. Fassett said we would be moving water only for a few days and not a couple months, so does that have an impact on groundwater if it is quick like that. Kenny said our wet meadow data suggests a short event will not cause those kind of groundwater impacts, but that prolonged releases for target flows could have a groundwater impact.

Sackett asked if there is any restriction now in terms of continued building in this area. Hawks said the city does not allow any construction in the zone. Hovorka said he agrees with Miller that we should keep all the alternatives on the table at this point and learn more about them. Sackett said as he visited with the landowners in the area after the 2011 flood everyone was interested in talking about a solution. Now that some steps have been taken, there may not be as much support. You have to keep this mind as you consider which actions to take. Fassett asked what the big flow was in 2011. Kenny said about 7,000 cfs at North Platte. Kenny asked if the GC wants the EDO to spend any more time to look at the big canal option to the west of North Platte. Miller said it seems like that is not a good option to pursue. Kenny said it sounds like we have done enough for now on the canal. We will explore further the groundwater impacts of a raised stage and will come back to the GC with more information.

Ament said there is a tremendous cost to all of these options and at the same time we are trying to put together a First Increment Extension and meet the water milestone. Everyone needs to keep in mind there is a limited amount of money that will be available to do any of this work. Barels said when he thinks about SDHF, target flows, and the choke point it seems like we need to sequence ourselves so we don't get too far ahead of ourselves on certain items.

Pallid Sturgeon

Smith summarized the EDO's pallid sturgeon memo and Galat gave a presentation from the ISAC on pallid sturgeon. There was a group discussion about pallid sturgeon issues and next steps. The GC agreed to incremental implementation of the four step process outlined in the EDO Pallid Sturgeon Memo (attached to these minutes for reference) with decisions by the GC to move from step to step. This includes building an internal Program pallid sturgeon workshop into the FY17 PRRIP budget and a subsequent expert workshop into the FY18 PRRIP budget, both with facilitation by Compass as an EDO Special Advisor.

PRRIP First Increment Extension

Ament discussed the recent meeting between the Signatories about the Extension. The Signatories offered the following bullet points for consideration in the Extension Proposal:

- The Program is committed to achieving the minimum water milestone of 130,000 acre-feet in annual reductions to target flow shortages. However:

  - The Program recognizes there are fiscal constraints to achieving this milestone, and
  - Scientific investigations need to be completed to confirm the need for 130,000 acre-feet in annual reductions to target flow shortages.
- The Program will invest the maximum amount of resources available to achieve at least 120,000 acre-feet in annual reductions to target flow shortages as quickly as possible during the First Increment Extension and will also invest in the science necessary to determine if the additional 10,000 acre-feet is justified.
- The Program is committed to finding the additional resources necessary to achieve that additional 10,000 acre-feet if justified by the science.

LaBonde said what is driving this direction is budget numbers and available cash are being evaluated. Reclamation and Wyoming have said what they can bring to the table, Colorado as well, and that is short of the original estimated budget of roughly $118 million. The last 10,000 acre-feet of water (120,000 to 130,000 acre-feet) is worth about $42 million out of that $118 million budget. With the open question of which flows work and do we need the full 130,000 acre-feet, the idea is to move the last 10,000 acre-feet toward the end of the Extension once we answer the question of whether the full 130,000 acre-feet is needed. Kraus asked if we have put together proposed annual budgets match with hypothetical revenues now that we have had input on the potential available budget. Kenny said we have drafted a budget but we have not included this new approach of focusing on the 120,000 acre-feet number and adjusting the budget and cash flow requirements accordingly. Barels said we received a large amount of reading material for this meeting and the Downstream Water Users still need to review the Extension proposal and determine if they have comments they want to provide.

The GC agreed to the following schedule for the Extension Proposal and budget:

- The EDO will distribute the revised draft Extension Proposal, based on GC discussion at the September meeting, to the GC on September 14, 2016.
- GC comments on that revised draft proposal are due to the EDO by September 30, 2016.
- The EDO will distribute the latest version of the Extension Proposal and budget to the GC for review by October 7, 2016
- The GC will have a conference call on October 14, 2016 at 10:00 AM Central Time to discuss the Extension Proposal and budget.
- One goal of the November 2, 2016 GC meeting in Denver is to get agreement on a final version of the Extension proposal and budget.

Future Meetings & Closing Business

Upcoming GC meetings:

- **November 2, 2016** @ Denver, CO (Special Session – FY17 Budget and First Increment Extension Proposal & Budget)
  Country Inn & Suites – Denver International Airport

- **December 6-7, 2016** @ Denver, CO (Quarterly Meeting)
  Warwick Denver

2016 AMP Reporting Session:

- **October 18-19, 2016** @ Omaha, NE (ISAC meets alone with EDO on Oct. 20)
  Hilton Garden Inn Downtown

Meeting adjourned at 11:52 AM Central Time.

Summary of Action Items/Decisions from September 2016 GC meeting

1) Approved the June 7-8, 2016 GC minutes.
2) Approved the July 26-27, 2016 GC minutes.
3) Approved the August 17, 2016 GC minutes.
4) Approved the score for the Cook Tract well.
5) Approved the Water Service Agreement for the Phelps Canal.
6) Approved the Water Service Agreement for Elwood Reservoir.
7) Approved allowing the Nebraska Community Foundation to sign Land Use Agreements for Tracts 1008, 1228, 1604, and 1605 on behalf of the Program.
8) Agreed to all the steps the EDO proposed for the pallid sturgeon process including building an internal Program pallid sturgeon workshop into the FY17 PRRIP budget and a subsequent expert workshop into the FY18 PRRIP budget, both with facilitation by Compass as an EDO Special Advisor.
9) Set a timetable for revising the Extension proposal and budget with the goal of agreeing to final versions at the November 2, 2016 GC meeting in Denver, CO.

PLATTE RIVER RECOVERY IMPLEMENTATION PROGRAM (PRRIP or Program)
Memorandum

TO: Governance Committee (GC)
FROM: Executive Director's Office (EDO)
RE: Pallid Sturgeon Background and Future Activities
DATE: August 31, 2016

Purpose

The purpose of this EDO memo is provide the GC context on recent issues related to pallid sturgeon in the lower Platte River and activities of the Program as well as some guidance on possible pallid sturgeon activities for the remainder of the First Increment and into the proposed First Increment Extension.

The final version of this memo is informed by input from the Technical Advisory Committee (TAC) and the Independent Scientific Advisory Committee (ISAC), both of which reviewed an earlier draft.

Background and Current Status

The EDO prepared a memo in 2010 at the GC's request providing a status update on pallid sturgeon and the Program. That memo is attached as **Exhibit A** and provides details on Program goals, objectives, and activities related to pallid sturgeon in the early years of the Program. Program activity on pallid sturgeon since 2010 focused on peer review of the stage change study and use of that final, GC-approved document to develop an assessment for Big Question #9 – *Do Program flow management actions in the central Platte River avoid adverse impacts to pallid sturgeon in the lower Platte River?* Based on the results of the peer-reviewed stage change study, the EDO assessed Big Question #9 as being answered in the affirmative and committed to using the stage change study tool to develop appropriate operational guidelines for Program water projects to ensure excess flows are not diverted at times the stage change study suggest could impact pallid sturgeon in the lower Platte River. The U.S. Fish and Wildlife Service (Service) does not concur with this assessment and provided direction for next steps in a presentation to the GC in June 2016 (attached as **Exhibit B**). This includes a recommendation the Program host a workshop of pallid sturgeon experts to provide insight into the current status of pallid sturgeon science and how the Program might engage in additional knowledge acquisition that could guide Program actions on pallid sturgeon in the future.

Independent Scientific Advisory Committee (ISAC) Commentary on Pallid Sturgeon

At the same June 2016 meeting, the GC asked the EDO to provide background on recent Independent Scientific Advisory Committee (ISAC) commentary on pallid sturgeon issues. The ISAC provided input to the GC on pallid sturgeon issues several times, including providing specific guidance on a step-wise approach to pallid sturgeon issues detailed in **Exhibit A**. Since that time, the ISAC offered additional guidance related to the stage change study, the proposed Service workshop, and additional Program actions. That ISAC commentary is best summarized in a recent email from ISAC member David Galat to the EDO:

Email to EDO from David Galat, ISAC Member, 06/10/2016

> Thanks for sharing this. Seems to me that the Service's lack of support for 2 thumbs up on BQ #9 goes beyond just the stage change study – at least that is how I read their PP:
>
> - Service suggests a clear description of a criterion (or criteria) to define Program impact
> - Translating 3-9% of 'pallid sturgeon habitat' loss to acres raises the question how many acres of habitat loss could occur without adversely affecting the species? Moreover, what exactly is 'pallid sturgeon habitat' on the Platte? for what life stage and at what time of year?

Note the ISAC is also on record as not supporting a 2 thumbs up assessment of BQ# 9:
While a one thumb up conclusion is justified, we do not support a conclusion of two-thumbs up at this time. The water part of the peer-reviewed stage change study is robust. However, the connection to sturgeon habitat is less certain because we don't know if the area modeled for sturgeon habitat suitability was sufficient given the true distribution of sturgeon, as discussed above. We recommend that the Program use the stage-change tool to adjust Program water operations to further minimize downstream effects during low-water conditions, and then re-evaluate the evidence for BQ 9." October 2013 report (pg. 10, lines 413-431) and reiterated in our August 2015 Responses to the following question: 1) Is the "two thumbs up" assessment for Big Question #9 in the 2014 State of the Platte Report logical based on your understanding of Program data and consistent with what you have learned during your involvement with the Program? (L 39-108 and Appendix A).

How the Program has responded to our recommendations might revise that assessment. I agree that a workshop would be useful to communicate to the GC and others what is known about pallid sturgeon ecology, recruitment, limiting factors, etc. – in general, the role of tributaries and specifically for the Platte. How flow is anticipated to affect pallid life-history by life stage and season, and other questions on slide #3 of the Service presentation.

Clearly "uncertainties linger" now that pallids are migrating further up the Platte than previously thought and that spawning is occurring (although not sure if there is evidence of recruitment?). A workshop will communicate what is known, get the issues on the table, ID specific uncertainties and possibly begin the discussion of approaches to reduce them. However, I believe it would be naïve to think such a workshop will resolve the issues; rather I expect it will add fuel to a now smoldering fire. Whether that fire continues to smolder, goes out, or flares up somewhat depends on how the GC addresses the larger policy issue we highlighted in our August 2015 report:

The draft 2014 State of the Platte report (pg. 29, lines 881-885) has the following statement:
"The U.S. Fish and Wildlife Service maintains the GC needs to address, at the policy level, perceived disagreement between the AMP management objective of "avoid adverse impacts from Program actions on pallid sturgeon populations" and the stated Program goal of "testing the assumption that managing flow in the central Platte River also improves the pallid sturgeon's lower Platte River habitat." *The ISAC agrees that the GC needs to address this perceived disagreement.*

Hosting a pallid workshop would also help tee-up a post-workshop time-frame for explicitly defining what the Program's objectives are relative to pallids. This seems to be the real issue that BQ# 9 is a part of. Over the years it seems the PPRIP has treated BQ# 9 as somewhat of an annoyance. I think those days are over, especially now that tern and plover recovery at the metapopulation scale is being successful.

Recent Pallid Sturgeon Documents

In their Power Point presentation to the GC, the Service pointed to certain key documents recently published that provide a good summation of current pallid sturgeon science and key outstanding life history issues that need resolved through additional monitoring and research. These documents have been compiled and posted in the Public Library section of the Program web site and are available for download as a PDF portfolio here (NOTE: very large file, nearly 45 MB):

https://www.platteriverprogram.org/PubsAndData/ProgramLibrary/2016%20Pallid%20sturgeon%20reference%20documents.pdf

1) Pallid sturgeon research on Platte River (Marty Hamel, University of Nebraska-Lincoln) – Published research based on random of sampling of pallid sturgeon in the lower Platte River that concluded pallid sturgeon presence and use was tied to the flow regime.

2) Synthesis of pallid sturgeon research (USGS) – A comprehensive synthesis of pallid sturgeon science from 2005 through 2012. Comprehensive treatment of existing pallid sturgeon science relative to a detailed life history conceptual model. Identifies information gaps and needs for all pallid sturgeon life stages. Includes strategies for moving toward a better understanding of landscape scale genetics, spawning habitat and cues, embryo and larval dispersion, food availability, and the relationship of all these to river management.

3) Missouri River pallid sturgeon effects analysis – conceptual model, supporting science, and working hypotheses (U.S. Army Corps of Engineers, USGS) – Effort to determine how pallid sturgeon population dynamics are linked to Missouri River flow management actions. Comprised of refinement of the pallid sturgeon life history conceptual model, compilation and assessment of relevant science, and the development of working hypotheses that link pallid sturgeon and management actions.

Considerations for Future Pallid Sturgeon Activities

As per previous ISAC guidance on pallid sturgeon issues, the EDO recommends a step-wise approach for the Program going forward.

Step 1 - Internal PRRIP Workshop

Purpose: * Clarify intent behind Program goal ("testing the assumption that managing flow in the central Platte River also improves the pallid sturgeon's lower Platte River habitat") and the pallid sturgeon management objective in the AMP ("Avoid adverse impacts from Program actions on Pallid Sturgeon populations."), and attempt to resolve any discrepancy.
* Discuss pallid sturgeon AMP management objective and consider possible language changes.
* Discuss Program's current understanding of pallid sturgeon ecology and management relative to Program water management to identify critical uncertainties; begin to develop hypotheses/questions relevant to Program decision making – general theme would be *what don't we know but need to learn*; this includes a discussion of all relevant Program flow management actions including the existing pallid sturgeon target flow and possible revisions to that target flow.
* Discuss Big Question #9 ("Do Program flow management actions in the central Platte River avoid adverse impacts to pallid sturgeon in the lower Platte River?") and consider changes to phrasing of question or additional pallid sturgeon Big Questions.
* Begin to develop criteria for GC decisions related to Program implementation and pallid sturgeon.

Participants: GC, ISAC, TAC, EDO, facilitator (Compass)

Timeline: First half of 2017

Cost Estimate: Estimate of $50,000 in FY17 budget (ISAC time/preparation, facilitator time/preparation, room and equipment rental, food/beverages)

Product: * Workshop report (drafted by Compass), including statements of any decisions made by GC during workshop; if approved/accepted by GC, move to **Step 2**.

Step 2 – Expert Workshop

Purpose: * Small, focused workshop of Program participants and pallid sturgeon experts from the lower Platte River, Missouri River, and other relevant systems.
* Review current understanding of lower Platte pallid sturgeon and Program water management, assess Program information needs and planned activities, and provide independent expert recommendations on necessary Program activities, suggested design of monitoring and modeling studies, and GC decision criteria.
* Possible working hypothesis to guide workshop discussion (from Dave Marmorek) – *Releases of Program water to meet target flows will cause beneficial effects to pallid sturgeon in the lower Platte River.*

Participants: GC, ISAC, TAC, EDO, facilitator (Compass), pallid sturgeon experts

Timeline: First half of 2018

Cost Estimate: Estimate of $150,000-$200,000 in FY18 budget (expert time/preparation, ISAC time/preparation, facilitator time/preparation, room and equipment rental, food/beverages)

Product: Final report (drafted by Compass) summarizing workshop discussion and expert recommendations; if approved/accepted by GC, move to **Steps 3 and 4**.

Step 3 – Expanded/Enhanced Stage Change Study *(if Steps 1 and 2 suggest it is important)*

Purpose: * Apply current hydrologic/hydraulic metrics and modeling to expanded geographic scale in lower Platte and resolve uncertainties related to outcome of initial stage change study.

Participants: * EDO conducts hydrology piece in-house
* Contractor brought on through competitive selection to conduct modeling

Timeline: 2019-2020

Cost Estimate: Estimate of $520,000; will be informed by workshops

Product: Joint final report from EDO and contractor, peer reviewed through Program peer review Process, that concludes whether or not releases of Program water will cause detectable changes in flow in the lower Platte River.

Step 4 – Focused Habitat Selection Research *(if Steps 1 and 2 suggest it is important)*

Purpose: * Utilize existing pallid sturgeon use locations in the lower Platte and apply flow variability to analyze potential impacts on pallid sturgeon habitat impacts due to Program water management.

Participants: Potential sole-source contract with University of Nebraska-Lincoln (UNL)

Sole-Source Justification Summary:

- UNL has conducted the most recent pallid sturgeon research on the lower Platte River that includes habitat information at use locations.
- Utilizing UNL's existing use location data would provide substantial cost and time savings to the Program. This would prevent the expenditure of $1.5 million+ on our own full habitat selection research project that would include capturing and tagging pallid sturgeon.
- UNL and the Nebraska Game and Parks Commission are the only local entities with the experience and current permission to capture, tag, and otherwise conduct research on pallid sturgeon.
- If the Program developed a full habitat selection research project study plan and sought a contractor through competitive selection, the only likely logical bidders would be UNL and/or the Nebraska Game and Parks Commission. The USGS unit out of

Columbia, Missouri (Robb Jacobson, former ISAC member, leads this unit) is conducting pallid sturgeon research activities on the Missouri River but when asked by the EDO this month via email, Robb Jacobson said they would not likely pursue Platte River research. The other entities conducting pallid sturgeon research on the Missouri are generally state fish and wildlife agency personnel from Montana, South Dakota, etc. and bringing their crews to the lower Platte River would most likely be cost-prohibitive.

Timeline: 2019-2020

Cost Estimate: Estimate of $200,000; will be informed by workshops

Product: Final report from UNL, peer reviewed through Program peer review process.

EXHIBIT A
2010 GC Pallid Sturgeon Assessment

PLATTE RIVER RECOVERY IMPLEMENTATION PROGRAM
Year Four (2010) Target Species Assessment – Pallid Sturgeon

Purpose

As requested by the Governance Committee (GC), the Executive Director's Office (ED Office) prepared this assessment of Platte River Recovery Implementation Program (Program or PRRIP) activities to date regarding pallid sturgeon (*Scaphirhynchus albus*), a Program target species. This assessment is presented in the context of implementation of the Adaptive Management Plan (AMP), which provides the scientific framework for the Program. The assessment includes an evaluation of key priority hypotheses, progress on specific pallid sturgeon tasks identified in the Integrated Monitoring and Research Plan (IMRP), and a discussion of important outstanding technical and policy issues.

This assessment is provided to the GC in an effort to convey science learning thus far to assist with management and policy decision-making regarding this target species.

Background

The Program's **overall long-term goal** is to improve and maintain the associated habitats, which includes:

"…3) testing the assumption that managing flow in the central Platte River also improves the pallid sturgeon's lower Platte River habitat." (Final Program Document, 2006)

For the purposes of the Program, lower Platte associated habitat is the reach between the Elkhorn River and Missouri River confluences, approximately a 40-mile (64-km) stretch. The assumption reflected in the long-term goal relates to the U.S. Fish and Wildlife Service's belief that existing water-related activities (those that depend on the Program for Endangered Species Act compliance) have at times reduced the quantity or rate of flow in the lower Platte between February and July and that further alterations (new depletions) to discharge patterns or channel morphology will degrade existing pallid sturgeon habitat in the lower Platte and thus impede recovery efforts.

As detailed in the AMP, Program participants developed a **conceptual ecological model** (CEM) as a graphical representation of the hypothesized understanding of the lower Platte River associated habitat relative to pallid sturgeon (Figure 1). The CEM includes inputs and management actions (some of which are predominantly outside the control of the Program) as well as a framework of "processes → response → indicators" that led to the development of several **priority hypotheses** related to pallid sturgeon. As with

other Program target species, those priority hypotheses are to be assessed against the pallid sturgeon management objective #3 that states:

> "Avoid adverse impacts from Program actions on pallid sturgeon populations" (Adaptive Management Plan, 2006)

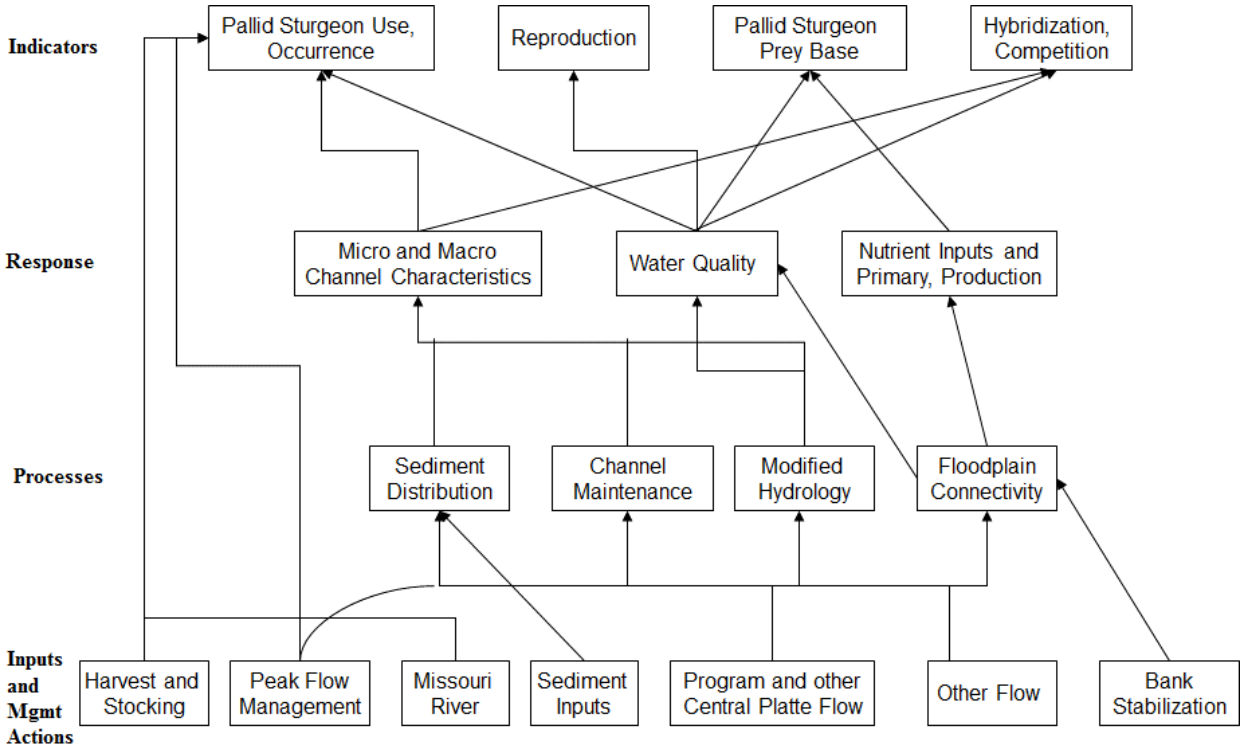

Figure 1. PRRIP pallid sturgeon conceptual model, AMP (2006).

This objective is commonly paraphrased as a "Do No Harm" objective and contains no measurable performance measures to assess progress, evaluate species response, or guide management actions. Instead, Program actions related to pallid sturgeon were to begin with **specific tasks** in the IMRP centered on better identifying sturgeon habitat and use rather than addressing specific in-river actions aimed at learning about species response (as done for other Program target species). Thus, Program activities since 2007 have been directed at monitoring and research designed to help fill existing data gaps and include:

1. A summary of existing information on the pallid sturgeon.
2. Micro- and macro-habitat use/selection by adult and juvenile sturgeon.
3. Identify the physical effects of subtly different rates of flow over time on connection, construction, maintenance, and evolution of pallid sturgeon habitat components.
4. Characterization of selected water quality parameters in the lower Platte and tributary contributions.
5. Periodic evaluation and peer review of information.

All but one (#2) of those activities is now complete or underway and can be evaluated in comparison to key priority hypotheses. An initial evaluation (Table 1) of the eight pallid sturgeon priority hypotheses

identified in the AMP suggests two are most critical (Tier 1) and actions to test those two hypotheses are necessary first steps in the Program addressing pallid surgeon issues:

- ***PS-2:*** Program water management will result in measurable changes on flow in the lower Platte River.
- ***PS-4:*** Flows in the lower Platte will affect pallid sturgeon habitat suitability.

Assessment of Pallid Sturgeon Priority Hypotheses

PS-2*: Program water management will result in measurable changes on flow in the lower Platte River.*

Assessment strategy and rationale

To test this hypothesis, the Program initiated the Lower Platte River Stage Change Study (IMRP pallid sturgeon activity #3) in 2008 to develop a tool to evaluate the potential effects of Program water management activities (storage projects, re-timing, water conservation, depletions covered by state and federal depletions plans) on stage and how stage changes might affect the physical characteristics of the lower Platte River. Field sampling, 1-D and 2-D modeling, and analysis were completed in 2009 and the study is now final.

Space and time frames

Study scale

The full study scale was the lower Platte River from the Elkhorn River confluence to the Missouri River confluence, as defined in the Program document. Intensive fieldwork and modeling were conducted on a smaller study reach from the Highway 50 bridge to the reclaimed Pedestrian Bridge near Louisville, Nebraska.

Time scale

Data collection and modeling began in September 2008 and concluded in October 2009. A final report was delivered to the ED Office in December 2009 and the study team made a presentation to the GC in March 2010.

Performance measures, expected response, analysis, and conclusions

Performance measures

- **Water depth and velocity** between 3,700 cfs and 40,000 cfs
- **Percentage of Program water** reaching Louisville
- **Changes in habitat classifications** (slackwater, flat, riffle, run, isolated pool, plunge) between 3,700 and 40,000 cfs
- **Number of days** below 4,000 cfs @ Louisville (Dry Conditions Analysis)
- **Range of flows** below 4,000 cfs @ Louisville (Dry Conditions Analysis)
- **Number of consecutive days** below 4,000 cfs @ Louisville (Dry Conditions Analysis)

Expected response

We predicted that given the influence of the Loup and Elkhorn Rivers on lower Platte flows, water management activities in the lower Platte, flow attenuation, and their size and timing, Program water

management activities would not have a statistically significant impact on lower Platte flows or on the type or availability of pallid sturgeon habitat (as defined only by the study's habitat classifications).

Analysis and conclusions

Percentage of Program water reaching Louisville: Analysis of historic reach gains and losses showed not all flow reaching Grand Island is translated downstream to Louisville and that predicted changes in discharge due to Program water management activities is likely within the range of gage uncertainty.

Changes in habitat classifications: 2-D modeling accurately predicted changes in the six habitat classifications over the range of modeled discharges.

Dry Conditions Analysis: The period of record was analyzed for one period in the spring and one in the fall when flows were above target at Grand Island, the Program could divert some portion of that excess, and flows were simultaneously in the 4,000-6,000 cfs range at Louisville. Assuming habitat connectivity is important for pallid sturgeon and that connectivity declines below 4,000 cfs, this analysis showed that short-term connectivity could be problematic, but only for one or a few days.

Conclusion: *Generally, Program water management will not result in measurable changes on flow in the lower Platte River.* However, given that short-term connectivity could be problematic under certain but infrequent hydrological conditions and assuming the biological significance of habitat connection for pallid sturgeon above 4,000 cfs, the study tool could be used by the Program to implement proactive measures (e.g. altering excess-to-target-flow diversion timing or duration) to prevent potential negative impacts on habitat connectivity. Use of the tool for this purpose would be greatly enhanced if additional data were collected and analyzed regarding what defines pallid sturgeon habitat in the lower Platte and how that habitat is being utilized (see discussion regarding Priority Hypothesis PS-4).

Outstanding Issues

With respect to PS-2, several issues have been identified and are expanded upon in the concluding *Technical and Policy Issues to Address* section of this assessment. In brief form, the issues are as follows:

1) Peer review of the Lower Platte River Stage Change Study
2) Assessment of the representativeness of the stage change study's 2-D modeling section
3) Definition of pallid sturgeon habitat and use

PS-4*: Flows in the lower Platte will affect pallid sturgeon habitat suitability.*

Proposed assessment strategy and rationale

Before testing additional pallid sturgeon hypotheses, more progress is required on better defining pallid sturgeon habitat in the lower Platte River, how that habitat is being utilized, and whether this habitat selection is resulting in pallid sturgeon reproduction and recruitment (IMRP pallid sturgeon activity #2). The Peters and Parham study of pallid sturgeon habitat use and movement on the lower Platte River did provide useful information on pallid sturgeon ecology and additional information on pallids is being

collected through an ongoing University of Nebraska-Lincoln sturgeon population characteristics study. However, that study is only capturing incidental pallid sturgeon (it is a shovelnose study), it is not providing habitat selection data, and even Peters and Parham (2008) suggested that additional habitat selection work is required.

In its 2009 report (Marmorek et al., 2009) the Program's Independent Scientific Advisory Committee (ISAC) provided the following guidance for addressing the pallid sturgeon priority hypotheses and management objective:

- Use a contingent, incremental approach for the sturgeon objective, only progressing to more detailed studies once initial questions have been answered. The stage sensitivity study will document the hydrologic sensitivity of lower Platte to central Platte flow management. If there is a change in flow which could be significant to sturgeon, then the next logical step would be to use a sparse, stationary telemetry framework to define migrations of sturgeon in/out of the Platte. If the telemetry results suggest that sturgeon are using the Platte for spawning, then consider studies of larval recruitment. One ISAC member has suggested that sparse telemetry studies *could* be done as a first step to determining the level and location of use of the Platte by pallid sturgeon, but to do such studies as part of the Missouri River Restoration Program (in coordination with the PRRIP).
- Evidence supports the notion that Platte River pallid sturgeon are Missouri River sturgeon. Movement of fish between the Missouri and Platte is a fundamental issue that needs to be addressed through expanded telemetry. If it is demonstrated that Program-managed discharge events persist downstream to affect reaches occupied by sturgeon, the remainder of the actions will depend on establishing the relative numbers of sturgeon using the Platte, and whether the Platte (or Elkhorn) provides critical habitat for its reproduction.

While the stage change study showed that, in general, lower Platte flow is not negatively impacted by potential Program water management activities, there are hydrological conditions and Program water actions that could result in some short-term loss of habitat connectivity unless preventative measures were undertaken to avoid the potentially negative impacts. According to the ISAC guidance, a next step should be taken through telemetry and habitat selection research to determine how pallids move from the Missouri to the Platte and if this movement is related to reproduction and recruitment (among other life history requirements). Then, results of this research could be used to test priority hypotheses PS-4 and potentially additional Tier 2 or Tier 3 hypotheses. In addition, this data could be used to refine the pallid sturgeon CEM and develop measurable indicators for assessing the current pallid sturgeon management objective.

Additional IMRP pallid sturgeon tasks also link to this potential habitat selection research:

IMRP Task #1 – Summary of existing information on the pallid sturgeon
Status: Complete; information review completed in 2008 and all documents available for consideration.

IMRP Task #4 – Characterization of selected water quality parameters in the lower Platte and tributary contributions
Status: Ongoing; annual water quality monitoring for temperature, turbidity, dissolved oxygen, and specific conductivity in both the central and lower Platte continues; sets baseline data on water quality

parameters believed to be of importance to pallid sturgeon; will be analyzed in conjunction with additional habitat data

IMRP Task #5 – Periodic evaluation and peer review of information
Status: Ongoing; this assessment, the upcoming workshop, and additional ISAC and other peer review will continue.

Outstanding Issues
With respect to PS-4 and the other tasks linked to habitat selection and use, it is the very issues of habitat definition, selection, and use that need addressed and these issues are expanded upon in the concluding *Technical and Policy Issues to Address* section of this assessment.

Technical and Policy Issues to Address
Based on the preceding material several issues have been identified that should be addressed. These issues are explored individually below, with options for action and estimated costs associated with the actions. In the opinion of the ED Office, Items #1 and #3 are necessary for scientific defensibility.

Peer Review of Stage Change Study

1. If the Governance Committee approves at the June 2010 meeting, then seek **peer review of stage change study.** The Program would contract with three to four independent peer reviewers representing expertise in pallid sturgeon biology, hydrology, and engineering in summer 2010 to provide a peer review of the study's methodology and conclusions.
   Estimated Cost: $20,000
   Funding: Existing funding for this peer review is available in the approved FY 2010 Program budget (line item PD-3: AMP & IMRP Peer Review)

Following from #1 ⇨

2. If the peer review suggests revisions are necessary and the TAC and GC agree, then contract with HDR to **complete stage change study revisions.**
   Estimated Cost: $10,000-$30,000
   Funding: Existing funding for potential study revisions is available in the approved FY 2010 Program budget (line item PS-2: Lower Platte River Stage Change Study)

Habitat Definition, Selection, and Use
To advance the discussion of habitat definition, selection, and use, tapping into the knowledge of pallid sturgeon experts from the Platte River and Missouri River in a workshop setting is recommended. The series of potential actions that could follow is provided below.

3. If the GC approves at the June 2010 meeting, then convene a **lower Platte River pallid sturgeon workshop** in fall 2010 with TAC members, ISAC members, and pallid sturgeon experts from the Platte River and Missouri River. Workshop discussion topics will include:
   - Whether the stage change study reach is representative of the associated habitat below the Elkhorn River confluence for purposes of further applying the study tool.
   - Based on results of the stage change study and additional data, is there potentially a change in lower Platte flow due to Program actions that could be significant to pallid sturgeon (is there a

possibility that the Program is violating its "avoid adverse impact" objective for pallid sturgeon?)?

- If so, assess the extent and scope of necessary habitat selection research.

Estimated Cost: $25,000

Funding: Existing funding for this workshop is available in the approved FY 2010 Program budget (line items PD-4: AMP Workshops and PD-11: AMP Reporting).

Following from #3, either #4 or #5 ⇨

4. If consensus at the pallid sturgeon workshop is the study reach is representative of the lower Platte associated habitat and if no revisions are necessary to the study (or after those revisions are complete; see #2 above), then determine logistics of **using the stage change study tool in conjunction with Program water management activities.** ED Office needs to explore how best to utilize the stage change study tool in planning for and operation of Program water management activities.
   Estimated Cost: N/A
   Funding: Existing funding for this work is available as staff time in the approved FY 2010 Program budget.
5. If consensus at the pallid sturgeon workshop is the study reach is not representative of the lower Platte associated habitat, then solicit TAC recommendation and GC approval of contracting with HDR to **revise and update study accordingly.**
   Estimated Cost: Depends on extent of revisions necessary; $25,000-$100,000+
   Funding: Additional funding for this activity would be included in proposed FY 2011 Program budget under line item PS-2; solicit GC approval in December 2010

Following from #3 ⇨

6. Pallid sturgeon have been sampled upstream of the Elkhorn River confluence (Hamel et al., 2010). If consensus at the pallid sturgeon workshop is the lower Platte upstream of the Elkhorn River confluence should be evaluated, then solicit TAC recommendation and GC approval in fall 2010 to **extend the stage change study** to cover the reach of the lower Platte from the Elkhorn River confluence upstream to the Loup River confluence near Columbus, Nebraska.
   Estimated Cost: Phase I (scalability assessment) – $30,000-$50,000; Phase II (perform stage change study based on Phase I assessment) – $200,000
   Funding: Additional funding for this activity would be included in proposed FY 2011 Program budget under line item PS-2; solicit GC approval in December 2010

Following from #3 ⇨

7. If consensus at the pallid sturgeon workshop is habitat selection research (telemetry study) should be conducted on the lower Platte, then develop **objectives, scope of work, and schedule; assemble funding partners** to allow Program to be a minor funding partner (in association with other Platte

River and Missouri River efforts); and solicit TAC recommendation and GC approval in fall 2010 to **move ahead with research in 2011.**

Estimated Cost: Habitat selection research was estimated to cost roughly $2.6 million (Adaptive Management Plan, 2006) during the First Increment; $650,000 (25% of original estimate)

Funding: Funding for this activity would be included in proposed FY 2011 Program budget under new line item PS-3: Pallid Sturgeon Habitat Selection and Use Research; solicit GC approval in December 2010

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HDR. 2009. Lower Platte River State Change Study Final Protocol Implementation Report.

Peters, E.J. and Parham, J.E. 2008. Ecology and management of sturgeon in the lower Platte River, Nebraska. Nebraska Game and Parks Commission, Neb. Tech. Ser. 18.

EXHIBIT B
U.S. Fish and Wildlife Service Pallid Sturgeon Presentation
June 2016

Pallid Sturgeon in the Platte River Basin

U.S. Fish and Wildlife Service

Ecological Services - Nebraska Field Office

PRRIP Governance Committee Meeting

June 8, 2015

Pallid Sturgeon in the Platte River Basin

Summary:

- The Service does not support two thumbs up for Big Question 9 because of lingering uncertainties
- The Service believes a Program workshop/symposium involving experts knowledgeable about pallid sturgeon biology is an essential step toward addressing these uncertainties

Pallid Sturgeon in the Platte River Basin

Proposed Questions for the Pallid Sturgeon Workshop:

1. What is pallid sturgeon use of the Platte River?
2. What is the relationship between pallid sturgeon use and flow?
3. To what extent does Program water management affect flow?
4. What is an adverse impact for pallid sturgeon on the Platte River?

Pallid Sturgeon in the Platte River Basin

Big Question 9: Do Program flow management actions in the central Platte River avoid adverse impacts to pallid sturgeon in the lower Platte River?

- **Big Question 9 concludes no adverse impact**
- **Did not specify type of impact(s)**
- **Service suggests a clear description of a criterion (or criteria) to define impact**
- **Then assess if Program water management has impacted the pallid sturgeon**

Pallid Sturgeon in the Platte River Basin

Big Question 9

Program Water Effects to Habitat:

- Program water management activities would be very small to undetectable
- Decreases in pallid sturgeon habitat is generally around 3 percent
- The maximum potential reduction in habitat is 9 percent

Pallid Sturgeon in the Platte River Basin

Big Question 9

Inability to detect Program water does not equal "no adverse impact":

	Species Impact	
Flow Detection	Detect Flow, Impact	Detect Flow, Not Impact
	Not Detect Flow, Impact	Not Detect Flow, Not Impact

Big Question 9 only addresses flow detection

Pallid Sturgeon in the Platte River Basin

Big Question 9

Program Water Effects to Habitat:

- Downstream of the Elkhorn River confluence – 3 to 9 percent habitat loss equates to 192 to 640 acre reduction in pallid sturgeon habitat
- Pallid sturgeon is documented upstream of the Elkhorn confluence
- Downstream of the Loup River confluence - 3 to 9 percent habitat loss equates to 640 to 1,984 acre reduction

Pallid Sturgeon in the Platte River Basin

Additional Research

1. Pallid sturgeon research on Platte River (M. Hamel, UNL)
2. Synthesis of pallid sturgeon research (USGS)
3. Missouri River pallid sturgeon effects analysis (USACE, USGS)

Pallid Sturgeon in the Platte River Basin

Summary:

- The Service does not support two thumbs up for Big Question 9 because of lingering uncertainties
- The Service believes a Program workshop/symposium involving experts knowledgeable about pallid sturgeon biology is an essential step toward addressing these uncertainties


Questions?