**PLATTE RIVER RECOVERY IMPLEMENTATION PROGRAM (PRRIP or Program)**

**Adaptive Management Working Group (AMWG) Virtual Meeting**

November 03, 2020

**Attendees** – **Jeff Runge**, USFWS; **Jim Jenniges**, NPPD; **Dave Zorn**, CNPPID; **Tom Econopouly**, USFWS; **Mike Drain,** CNPPID; **Brandi Flyr**, CPNRD; **Brock Merrill,** USBR; **Jojo La**, State of Colorado; **Jason Farnsworth, Malinda Henry, Patrick Farrell, Chad Smith** – Executive Director’s Office (EDO)

EDO Power Point presentation slides in PDF

* [03 November 2020 AMWG Presentation](https://platteriverprogram.org/system/files/2020-11/03%20November%202020%20AMWG%20Presentation.pdf)

**Welcome & Administrative**

* Henry welcomed the group and discussed the general framework for the agenda today, critical review of our uncertainties with regard to terns and plovers as revealed in online Mentimeter Poll will help focus our discussion today to those BIG QUESTIONS that the group would like the Program to address for terns and plovers moving forward into the Extension.
* No agenda modifications.
* Henry provided a quick review of the October 20th meeting which culminated in the suggestion of performance indicators for gauging progress toward our management objective.

**Review of Questions to Address**

* The goal of today’s meeting is to use the information gained in the First Increment to help focus our work to those areas where more information is needed (high uncertainty), where we have management options that allow for greater control, and thus higher expectations for improvements in productivity.

**Virtual Tools Tutorial**

* Henry asked whether all members of the group were able to access the Mentimeter Poll asking about information needed to improve LT and PP productivity. All were able to access the poll, some chose not to respond.

**Terns & Plovers – What do we need to know?**

* Henry discussed the Mentimeter poll posted online that asked, “What don’t we know about LT and PP that we need to know to improve production?”
* [3 Nov 2020 AMWG Mentimeter Poll BIG Questions LT PP](https://platteriverprogram.org/system/files/2020-11/3%20Nov%202020%20AMWG%20Mentimeter%20Poll%20BIG%20Questions%20LT%20PP.pdf)
* She organized all responses according to commonalities in subject matter. The group discussed each in the order presented.
* **Program’s role for LT after de-listing?** The understanding of the group is that the Program will continue habitat management and monitoring for the LT in as far as they share habitat with the PP and any management done to improve PP productivity may provide subsequent benefits to LT. Monitoring of LT will continue to document maintenance of species conservation status. From an AMWG perspective, we will be planning for ways to gain more information to better manage plovers specifically, answering plover-specific BIG QUESTIONS and building a plover-specific CEM with the assumption that what is good for plovers will also benefit terns.
* **Is there a need for continued AM**, or is a shift toward managing existing habitat to the best of Program abilities a better description of what is needed? It was explained that AM as a way of utilizing science learning to choose between competing, mutually exclusive hypotheses that correspond to contrasting management actions is probably no longer necessary for LT and PP. However, there is still learning that can be done to improve on existing management.
* **More information is needed related to tern and plover productivity and predation (terrestrial and avian). We need more information on the fate of unknown nests and chicks which is always a large portion of failures.** Henry asked if the unknown question could be considered as related to the problem of predation. It was suggested that many of the failures with unknown causes may be predation, but without enough evidence to attribute to predation.
  + Henry presented data on failed nests and broods attributable to predation as well as failed nests and broods due to unknown causes from the AHR as well as the Missouri River Recovery Program to document the size of the problem.
  + She also presented nest and brood fate data comparing inside vs. outside monitoring to demonstrate the potential reduction in unknowns that inside monitoring may provide. She pointed out that inside monitoring does not eliminate unknowns. She also presented nest abandonment for inside vs. outside monitoring as a potential cost to adopting this more invasive monitoring strategy.
  + She was asked about the monitoring method currently employed, which is outside monitoring, but with entrance onto sandpits for nest camera placement/removal as well as to perform track surveys.
  + Additional data from site-level and wing-panel cameras was presented to show predator presence on off-channel habitat. In summary, predation communities differ by year and by site with a high degree of variability.
  + It was asked whether predators were getting onto sites by swimming around the panel wings or by swimming directly across the moat.
  + The Program has camera evidence at panel wings and instances of moat crossings, but cameras on shorelines would be informative to quantify this.
  + Program analyses to date do not provide strong evidence that predator presence as registered by on-site cameras is a good predictor of either nest survival or fledge count.
  + Data from nest cameras was also presented as it is used to attribute failed nests to predation.
  + It was asked how a failed predated nest with a camera on it could not record the event. Henry pointed out difficulties in catching actual predation on camera.
  + Data from USDA-APHIS trapping along the outside of off-channel habitat was presented.
  + The question was raised about the effectiveness of mammal trapping at off-channel sites. Henry said difficult to evaluate effectiveness since all sites have the trapping, so no control sites for comparison. We have data on what is caught, so traps are catching potential predators, but no sites for which no trapping is done to see if productivity would be lower if we didn’t do the trapping.
  + So, there are data to show that predation is a cause of nest and brood losses, whether we can catch it on camera or not. Predation is a risk to productivity and deserves attention as a BIG QUESTION going forward into the extension.
* **Are there enough forage resources on off-channel habitat, and how does that change with site age? What is the carrying capacity of existing habitat?** Henry introduced carrying capacity as defined by both the species and the habitat in question. Carrying capacity is a question of availability of multiple resources including space, food, mates, etc. Does the group understand carrying capacity in terms of only food availability or also as a spatial, density-dependent concept?
  + Henry said that she would like more information with regard to the question on site age: is this a concern about reduced forage resources, reduced space (higher densities), accumulated predator learning, what is it about site age that affects productivity?
  + The Program has no data on how off-channel forage resources change over time.
  + The comment was also made “What can we do about it?”. Are we going to feed plovers at off-channel sites?
  + Henry suggested that for plovers, it may be a question of increasing surface area or shoreline, increasing usability of sharply declining edges, scalloping borders to increase forage resource availability.
  + Farnsworth commented that pit design is often limited by the original form and structure you inherit at purchase. There is a limit to what you can do with a high associated cost.
  + It was mentioned that given the money allocated to habitat maintenance, site improvements may be feasible if necessary to attain management objectives.
  + Henry presented Program data on PP productivity (fledges/BP) in response to density (BP/acre) from 2001 to 2020.
  + Across the AHR plover densities have been around 1 breeding pair per 2 acres or less, with no clear decrease in productivity at higher densities (though there are fewer occurrences at higher densities).
  + Henry also demonstrated site-specific plover densities demonstrating the same basic pattern.
  + Without compelling evidence in support of density limitations on productivity, and little control over food availability or density (no feasible management actions to address this), it was decided that food resources and carrying capacity were of lower priority and would not be included as BIG QUESTIONS for plovers moving forward with the AMP.
* **Is there a need to evaluate reproductive success at a site-specific level to help guide management practices at a given location?** Henry responded that yes, this is important and currently being evaluated by the EDO as a way to improve production at “underutilized” sites. What are the characteristics associated with sites where birds occur at higher densities?
  + Maybe this as more of an experimental design and analytical methods question rather than a BIG QUESTION?
  + Site-specific results should help guide site-specific management
* **Does the AHR serve as a source or sink to the overall Northern Great Plains population? How do we know?**
  + To get at this question we would need to have data from multiple sources collecting data on the metapopulation? Do we really want to get into this?
  + This is beyond our management objective as currently written, but the AMWG could make the suggestion to the GC to add a Population Viability Assessment as a Management Objective.
  + The more current metapopulation analyses by McGowan et al. 2014 and Catlin et al. 2016 suggest that stable, human-created and maintained habitats provide a stable source of fledges that, although they may have lower reproductive output in some years, buffer more variable boom and bust river sandbar systems from local extinction.
  + The question was raised that all populations serve as sources in some years and sinks in others.
  + Analyses that incorporate this annual variability over the long term, 50-100 years, still show that stable habitat serves as a source of fledges to buffer more dynamic populations over the long term.
  + The USGS is currently presenting their metapopulation analysis at the MRRIC Fall Bird Meeting. The Program has provided data to this project and has requested information on this question but has been asked to wait for the anticipated December publication.
  + Without good information on adult/juvenile survival and immigration/emigration, the Program cannot answer this question.
  + This raises the question of whether we need to know the answer to this question to meet our Management Objective, or do we manage our small part of the world to the best of our ability while the birds are here. The rest is out of our control.
* **Actions that improve on-river production. How to fully maximize existing Program water to benefit target species?** Clarification was asked for about what was meant by actions to improve on-river production.
  + The Program established management actions that could lead to in-channel nesting including: germination suppression flows, in-channel disking and herbicide application, sediment augmentation, and in-channel MCA habitat.
  + The Program’s ability to increase the number of nests/chicks is limited absent creation of new OCSW habitats, so Program management for on-channel nesting could provide an opportunity to increase number of nests and chicks.
  + These actions will continue through the Extension as currently being implemented with LT and PP monitoring of on-channel nesting to increase from twice monthly to twice weekly if and when we have on-channel nesting.
  + It is difficult to adaptively manage for on-channel least tern and piping plover nesting given the absence of nesting on sandbars. A member proposed two management options for the GC/TAC to consider: 1) the Program can adopt habitat indices with an expectation that improvements in indices may increase the likelihood of on-channel nesting, or 2) implement management actions in without indices and adaptively management once nesting is observed.
  + Presently, no habitat indices for on-channel nesting have been established.
  + Clarification was asked for about what was meant by “target species” as this question is different depending on the species of interest.
  + Henry assumed this comment was directed toward LT and PP since these are the target species currently up for discussion.
  + Currently existing Program water is utilized according to a trade-off between suppressing in-channel germination and providing water during spring and fall whooping crane migration. This discussion will become more elaborate when we discuss the whooping crane AMP, but for terns and plovers the principal use of water is to maintain sandbars free of vegetation.
  + After finalizing the group discussion of important uncertainties around LT and PP productivity, predation and its impacts on PP productivity was the single BIG QUESTION that stood out to the group for continued scientific inquiry to be focused upon in developing the AMP into the Extension.

**Terns & Plovers – Ranking Direct Impacts on PP productivity**

* The group responded to a Mentimeter Poll asking them to rank the impacts of terrestrial and avian predation on PP productivity in terms of severity, scale and irreversibility.
* The group also responded to questions about the Program’s level of uncertainty around predation’s impact on PP productivity, the Program’s ability to control this impact, and anticipated effectiveness of the Program’s management actions.
* Some members chose not to respond based upon limited information on the subject.
* [3 Nov 2020 AMWG Mentimeter Poll Evaluating Predator Impacts on LT PP](https://platteriverprogram.org/system/files/2020-11/3%20Nov%202020%20AMWG%20Mentimeter%20Poll%20Evaluating%20Predator%20Impacts%20on%20LT%20PP.pdf)
* These rankings will be utilized in assigning uncertainty, control and effectiveness to relationships between PRRIP actions, habitat, species response and productivity in the Conceptual Ecological Model (CEM).

**Terns & Plovers – Conceptual Ecological Model Building and Refinement**

* In the interim between AMWG meetings, the tern and plover specialists worked as a small group to refine the LT and PP Draft CEM as it stood early in 2020.
  + [Aug 1 2019 LT PP CEM DRAFT](https://platteriverprogram.org/system/files/2020-11/Aug%201%202019%20LT%20PP%20CEM%20DRAFT.pdf)
* The group as a whole thought the CEM was well-developed but had a few suggestions for refinements.
* One member presented information on pairs, nests, and nest success. Information indicates that nest success and renest rates may be higher than what is reported in scientific literature. A likely alternative explanation is that breeding pairs are undercounted. The member said that uncertainty with breeding pairs would similarly indicate uncertainty with linked metrics such as hatch ratio and fledge ratio.
* Henry summarized the suggested refinements to the existing CEM in a MURAL diagram emphasizing those components relevant to predator management.
  + [03 Nov 2020 AMWG SpecialistGroup Revision LTPP CEM draft](https://platteriverprogram.org/system/files/2020-11/03%20Nov%202020%20AMWG%20SpecialistGroup%20Revision%20LTPP%20CEM%20draft.pdf)
* Henry asked the LT and PP specialists what they suggested for a revision in terms of what we know about predation’s impact on LT and PP productivity.
* We know who our predators are, we just don’t know their response to our actions or whether our actions improve productivity.
* Predation’s impact on productivity was rated as Low Control and High Uncertainty, regardless of the performance indicator being used and predation impacts them all similarly.
* Henry then summarized the group’s progress for this meeting, reducing the BIG QUESTIONS to be addressed in the AMP to gaining information regarding predation’s impacts on PP productivity.
* She then asked what information does the Program need with regard to predation to help reduce predation’s impact on PP productivity?
* We need to identify the predator.
* How much loss is associated with terrestrial vs. avian predators?
* Is egg loss, nest loss and/or chick loss the problem?
* Most losses are at the egg and nest stage.
* How effective is mammal trapping at reducing predators on the sites?
* How effective is nest caging in reducing losses to predation?
* How effective is fencing in reducing predator presence on the sites and losses to predation?
* Henry asked how do we get this information?
* Continue with camera monitoring.
* Questions were posed with regard to the number and types of cameras to deploy.
* Concerns regarding potential negative impacts on productivity from having too many cameras on sites and having biologists moving cameras around on sites.
* Depending on camera results, test different types of predator management actions and their effectiveness at a site-specific, predator-specific scale.
* This is just management. The EDO doesn’t need an adaptive management plan to do this.
* The group discussed fencing, nest caging, lighting, mammal trapping both outside and inside sites.
* Avian trapping and removal have been removed from our arsenal due to GC refusal to utilize this action.
* Fencing is high maintenance and may have negative impacts on birds if done over the entire site.
* Nest caging has had short-term positive results, but also negative impacts. Recommended at a site-specific (avian predator problem) level over short periods with continuous monitoring for predator key in and harm to PP and LT. Decoy cages and decoy eggs were suggested.
* Lighting is still under consideration, but we are having trouble measuring effectiveness. Questions regarding density of installation as well.
* Suggestion made to trap inside as well as outside pits to eliminate problematic predators that evade outside traps.
* Inside trapping would have to be done under the supervision of our biologists to avoid take.
* Do we manage as we go along on a site-specific, predator-specific basis using trial and error? Just do what needs to be done at the time.
* Do we perform experiments with these methods with proper experimental design to make it possible to evaluate effectiveness?
* Henry reinforced the need for experimental design. There is too much variability in the system; annual, site, productivity to even hope to evaluate effectiveness of management without carefully considering standardized experimental design and analysis prior to implementation.
* **Preparation for Next Meeting**
* Next meeting, we will further develop our plan for science learning about predation’s impacts on LT and PP productivity.
* We will work together to develop PRRIP predator management actions using proper experimental design that allows us to analyze the effectiveness of these actions on predator presence and abundance as well as the impacts of predation on productivity.
* We will work to clearly define treatments at specific sites and appropriate response variables.
* We will clearly diagram this process in our CEM.
* There will be no literature to review for the next meeting.

**Meeting Review & Wrap-Up**

* Henry thanked everyone for the active participation and summarized the progress made in deciding how to move forward with LT and PP science learning into the Extension.
* The group agreed that the Program is indeed meeting its Management Objective for terns and plovers by increasing both available nesting habitat and increasing tern and plover productivity and numbers.
* The suggestion was made to incorporate some kind of standardized criteria for assessing whether BIG QUESTIONS are being answered as we move into the Extension, rather than using the thumbs up or thumbs down rating.
* **Next meeting** – November 17, 2020; 1:00-5:00 PM Central Time.

Meeting adjourned at 5:00 PM Central Time.