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

**Adaptive Management Working Group (AMWG) LT/PP Adaptive Management Plan (AMP) Progress Summary**

January 2021

**INTRODUCTION**

The AMWG met bimonthly since October 8th, 2020 to work on revising the AMP for the Extension. The group worked through the AMP revision process with one target species or species group at a time, beginning with interior least terns (LT) and piping plovers (PP).

**MANAGEMENT OBJECTIVE FOR INTERIOR LEAST TERNS AND PIPING PLOVERS**

Discussion began by introducing the management objective for terns and plovers. The Program management objective is to “increase interior least tern and piping plover productivity from the central Platte River.” We then asked the question “Is the PRRIP meeting the management objective for terns and plovers?” via a [Mentimeter poll](https://platteriverprogram.org/system/files/2020-10/10_08_20%20AMWG%20Management%20Objective%20MENTIPOLL.pdf):

Three of nine respondents initially expressed concern about meeting the objective and referenced:

* reduced fledge ratios over the last few years, and
* the lack of evidence that the central Platte River (CPR) contributes to a self-sustaining metapopulation.

Those who agreed that the PRRIP is meeting the management objective responded based on different interpretations of the management objective:

* The management objective was met based on increased numbers of birds relative to before the Program existed (1997) or without the Program’s actions.
* The management objective was met based upon the creation of habitat for the birds which increased numbers of birds.

The lack of agreement over whether the Program is or is not meeting the management objective for terns and plovers reflects the ambiguity surrounding the objective as currently written.

As discussion returned to this subject over the weeks, the AMWG agreed the Program is meeting the management objective for terns and plovers. However, the suggestion was made to document the criteria used to come to this conclusion.

**Q: Are we meeting the management objective?**

A: At this time, yes.

The AMWG agrees the PRRIP is meeting the management objective based on the following:

* The management objective was met based on increased numbers of birds relative to before the Program existed (1997) or without the Program’s actions.

The management objective was met based upon the creation of habitat for the birds which increased numbers of birds.**PERFORMANCE INDICATORS FOR INTERIOR LEAST TERNS AND PIPING PLOVERS**

In an effort to help us agree on whether we are meeting our management objective, performance indicators were introduced as a way of quantitatively evaluating progress toward a qualitative, intentionally broad management objective. The Structured Decision Making (SDM) process the Program went through for evaluating the costs and benefits of on- vs. off-channel nesting habitat for terns and plovers was used to remind AMWG members of how performance indicators have been used for decision-making by the Governance Committee (GC). The group discussed the performance indicators related to productivity currently being used for terns and plovers: breeding pairs, nests, chicks, daily nest and brood survival, and fledge ratios. Examples of temporal and spatial variability in each of these indicators was demonstrated for the Associated Habitat Reach (AHR), the lower Platte River, and the Missouri River reflecting the need to consider acceptable ranges for annual or 3-yr average values to accommodate normal variability in population dynamics and productivity. The EDO introduced a tool to help the group define:

* which indicators have more impact on population size into the future, and
* ranges of acceptable variability vs. areas of risk for future productivity and population size.

The EDO-developed model is based upon population viability modeling, incorporating modeling techniques and population parameters from the published literature and Program data on terns and plovers into a tool designed to help us decide which productivity factors have more impact on species outcomes. Also, what levels of productivity over what time periods may pose a risk to positive species outcomes:

* The group thought that decision-making and risk assessment was beyond the scope of the AMWG.
* Given the Program’s lack of control over a migratory sub-population and the fact that only a very small percentage of the Northern Great Lakes regional population uses the CPR for nesting, any attempt at population modeling would be incomplete and beyond the scope of the Program.
* In addition, any population modeling should be the product of a pre-defined hypothesis rather than a “fishing expedition.”

Given the group’s objection to the tool proposed by the EDO, that tool was put aside.

Group members were next asked to identify the performance indicators they thought were most appropriate based on their own technical experience.

**Q: What performance indicators are we measuring?**

The AMWG suggested the use of a suite of performance indicators, rather than a single indicator that does not tell the whole story. Reduction in multiple indicators would raise a red flag, rather than a single, possibly misleading indicator. The following suite of performance indicators were suggested:

* Breeding pairs
* Eggs produced
* Egg survival
* Fledges
* Fledge ratio (fledges/breeding pair)
* Adult survival

To meet the management objective of improving productivity, the Program should:

1. Increase the number of fledged tern and plover chicks by:
   1. Increasing nesting pairs (indicator is breeding pairs)
   2. Decrease losses to predation (indicator is daily nest and brood survival, nests and broods fated as Failed Predated)
   3. Increase fledge ratio (indicator is fledges successfully produced per nest or breeding pair)
2. Reduce adult mortality
3. Decrease losses to predation (indicator is adult mortality attributed to predation)

**Q: How are we measuring these?**

A: We will use monitoring data and associated calculations.

A: The Program should consider ranges instead of static metrics and build in a time component that allows us to incorporate normal annual variability and the longevity of these birds that allows them to forego reproduction for multiple years without reducing population viability.

**Q: How should we communicate using these performance indicators?**

A: Consider using the tool of risk analysis (Consequence (C) ratings, Likelihood (L) ratings, Risk (CxL) ratings, risk matrices) to identify red flags. These would be longitudinal red flags, meaning over some kind of longer time increment rather than concern about intra-annual changes in productivity metrics. For example: to communicate with the AMWG and TAC, we could agree to numerical ranges that make sense based on Program learning, historical and recent literature, guidance from other programs, and guidance from the Service as to what is important re: the Biological Opinion. To communicate with the GC, we could just report risk ratings (based upon consequences to target species and likelihood of failure to meet management objective) and say if green, nothing to see here; if yellow, we are good but keeping an eye on things; if red, the TAC recommends research or changes to management actions. We still say annually whether we are meeting the management objective but can weigh that against expected changes over time.

**MAJOR AREAS OF UNCERTAINTY**

The group was asked via a [Mentimeter poll](https://platteriverprogram.org/system/files/2020-11/3%20Nov%202020%20AMWG%20Mentimeter%20Poll%20BIG%20Questions%20LT%20PP.pdf) “What don’t we know about LT and PP that we need to know to improve production?”. The following items were discussed as potential Big Questions for terns and plovers.

* Program’s role for LT after de-listing? – Continue to monitor, management actions primarily plover driven with the understanding that terns also benefit.
* Is there a need for continued adaptive management (AM)? – The issues for terns and plovers are mainly adjustment to management for which a decision on one or the other to implement needs to be made. Does not warrant level of Big Questions or true AM.
* 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. AMWG members were also asked to rate the impact they believed terrestrial and avian predators have on tern and plover productivity as well as the degree of uncertainty around this impact, the amount of control and effectiveness the Program has in mitigating these impacts via a [Mentimeter poll](https://platteriverprogram.org/system/files/2020-11/3%20Nov%202020%20AMWG%20Mentimeter%20Poll%20Evaluating%20Predator%20Impacts%20on%20LT%20PP.pdf).
* 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? Largely out of the control of Program management actions. Large-scale manipulation of sites further than current land management plans to test whether carrying capacity can be increased is largely out of Program control.
* Is there a need to evaluate reproductive success at a site-specific level to help guide management practices at a given location? Yes. Is currently being done and will continue.
* Does the AHR serve as a source or sink to the overall Northern Great Plains population? How do we know? This is out of the scope of Program management.
* Actions that improve on-river production. How to fully maximize existing Program water to benefit target species? Based on Program learning, the GC decided to focus efforts on off-channel habitat and nesting, keep MCA on-channel habitat alive, and recommend the Service not use EA water to prioritize tern/plover nesting or tern forage. We are not aware of new learning that would suggest re-visiting that decision, but we will keep an eye out for that new learning and make recommendations accordingly.

Out of this discussion, the impact of predation on tern and plover productivity and the Program’s ability to mitigate this impact emerged as an area of uncertainty remaining for which negative impacts on productivity have been documented and the Program has the ability to manage.

**Q: What are the major areas of uncertainty that remain regarding the relationship between tern/plover productivity and Program management?**

A. Predation – an identified information gap based on a recent decline in productivity numbers.

The AMWG agreed to address through the implementation of management practices in a systematic way that allows the Program to quantify the impacts of predation on productivity and the Program’s ability to mitigate those impacts.

**Q: Does remaining area of uncertainty require development of Big Questions that can be related back to the GC for input into decision-making?**

A: At this time, no.

**Q: Where do we go from here? What should be our next step for terns and plovers?**

A: Continue to flesh out a management/Science Plan that is designed to monitor losses to predation, reduce losses at sites with high predation and gain information about predation that will contribute to more effective future management.

* Beyond that, terns/plovers diverge from the typical AM six-step cycle and we focus on annual monitoring and watching the ranges of our performance indicators to keep track of how the Program is performing against the management objective.
* We do not anticipate full application of AM for terns/plovers in the remainder of the Extension.