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

**PRRIP Extension Science Plan Target Species Summary: Interior Least Tern (LT) & Piping Plover (PP)**

February 2021

**Editorial Disclaimer:** This document currently serves as a PRRIP Executive Director’s Office (EDO) Working Draft summary of recent discussions with the Adaptive Management Working Group (AMWG) regarding the status of science for the LT and the PP within the Program as target species and science learning priorities for the PP in development of the Extension Science Plan. AMWG meetings were held in accordance with direction from the Governance Committee (GC) as described below (built on text from the *08\_21\_20 EDO memo* distributed to and discussed with the GC at their September 2020 Quarterly Meeting). This summary serves as a brief roll-up of extensive AMWG commentary and feedback over the course of several virtual meetings in the last half of 2020 and early in 2021. The entirety of the language below does not, at this time, represent full AMWG consensus and will be the topic of continued discussion and revision during development of the Extension Science Plan in 2021. However, some or all of the text below (as-is or as subsequently revised) may be integrated into that Science Plan.

***NOTE:*** *The final rule for delisting the LT becomes effective on February 12, 2021. The GC will be discussing the Program implications of this delisting during their March 2021 Quarterly Meeting. GC and U.S. Fish & Wildlife Service (Service) guidance will determine how the LT/PP section of the Extension Science Plan accommodates the delisting of a Program target species.*

**AMWG Role in Development of PRRIP Extension Science Plan**

The GC re-constituted the AMWG in September 2020 and directed the group to be responsible for working collaboratively with the EDO to generate the technical content of the Extension Science Plan. General task process for the Extension Science Plan:

Extension Science Plan – AMWG & EDO content tasks:

***Task 1:*** *Assess the LT/PP management objective* – discuss whether and how the Program is meeting the LT/PP management objective, performance indicators, and how to communicate Program progress toward and effectiveness at meeting the management objective to the GC over time.

***Task 2:*** *Evaluate and refine LT/PP conceptual model* – ensure proper linkages between current Program management actions, habitat responses, and target species responses; identify areas and relationships with uncertainty needing further investigation.

***Task 3:*** *Identify important LT/PP technical uncertainties and develop potential priority hypotheses* – based on areas of uncertainty in the conceptual models, brainstorm the language of hypotheses (determining *a priori* independent and dependent variables) for testing management actions, develop expected response functions (X-Y graphs for predicting response), and map out how answering hypotheses (and alternative hypotheses) will be communicated to the GC as an input to decision-making.

***Task 4:*** *Develop a new set of LT/PP Big Questions for the Extension* – work collaboratively with the EDO to develop a proposed set of Big Questions for the Extension that serve as a roll-up of underlying hypotheses and that provide an organizational tool for tracking progress against management objectives and communicating science learning to the GC.

Extension Science Plan – AMWG & EDO process and communication tasks:

* *Communicate technical information to the Technical Advisory Committee (TAC) and GC* – take ownership of content in the Extension Science Plan and present material at TAC and GC meetings.
* *Participate in writing and technical review of the Extension Science Plan* – homework assignments, participation in numerous virtual and in-person (when allowable) meetings and workshops, and communication with the Independent Scientific Advisory Committee (ISAC).

The work of the AMWG was not intended to replace the review, recommendation, and approval authorities the Program Document delegates to the TAC, LAC, WAC, and GC. Specifically, AMWG work products will be provided to the TAC for review and comment and the TAC will be responsible for recommending a final draft Science Plan for final GC review and approval. The frequency of AMWG interaction with the TAC will depend on Science Plan development progress but we anticipate regular check-ins to confirm that the larger body is comfortable with work products prior to advancing to each subsequent step of Science Plan development (see list above).

In developing the Extension Document, the GC decided that the current management objectives in the Adaptive Management Plan (AMP) should remain. As stated in the AMP, “management objectives are a means to evaluate effectiveness of different Program actions within an adaptive management framework.” Thus, management objectives are the currency with which the EDO and technical representatives of Program partners can communicate science learning and the effectiveness of management actions to the GC. Neither the Final Program Document nor the AMP (which is Attachment 3 in the Program Document) prescribe a particular process for how this communication is to occur (i.e., who determines if the Program is meeting the management objectives and what does it mean to “meet” the objectives). The EDO intends to work with the AMWG going forward to iteratively evaluate whether the Program is currently meeting the management objectives, how those objectives are measured, and what it means for Program science learning as an input to GC decision-making. That evaluation will be transmitted to and discussed with the TAC and ISAC before being reported to and discussed with the GC via the annual *State of the Platte Report*.

**TASK 1: ASSESS THE LT/PP MANAGEMENT OBJECTIVE**

The current LT/PP management objective in the AMP is:

Improve production of Least Tern and Piping Plover from the central Platte River.

1. Increase number of fledged tern and plover chicks.

i) Increase nesting pairs (indicator is nesting pairs).

ii) Increase fledge ratios (indicator is chicks successfully produced per unit adult, nest, or pair) and reduce chick mortality from causes such as flooding, predation, weather, inadequate forage.

1. Reduce adult mortality.

i) Reduce predation (indicator is nesting pairs).

**It is the consensus opinion of the AMWG that as of January 2021 the PRRIP is meeting the LT/PP management objective.** That consensus opinion is based on the following proxies:

* An increase in the number of LT & PP since the start of the Program in 2007.
* An increase in the amount of available nesting habitat for LT & PP since the start of the Program in 2007 that resulted in an increased number of birds.

**TASK 2: EVALUATE AND REFINE LT/PP CONCEPTUAL MODEL (CM)**

A revised CM was developed and discussed with the AMWG both in 2019 and again in the fall of 2020. That revised CM will be presented in the Extension Science Plan with a summary of AMWG discussions on and guidance for reducing any critical uncertainty linkages identified by the AMWG.

Moving forward, the AMWG discussed using a suite of performance indicators to better assess the relative success of Program management actions while ensuring the LT/PP management objective continues to be met over time. A downward trend in multiple indicators, for example, would likely raise a more substantive and concerning red flag than a single, possibly misleading indicator. The AMWG identified the following suite of performance indicators:

* *Breeding pairs* – An estimate of the number of unique male/female pairs nesting at a specified location during a specified period of time based upon nest and brood counts and taking renesting into account [(Baasch *et al*. 2015)](https://onlinelibrary.wiley.com/doi/10.1002/ece3.1680). The Program typically reports breeding pairs at their peak, when numbers of breeding pairs observed during a single observation period within the entire Program AHR first peaked.
* *Eggs produced* – Highest number of eggs observed over the nesting period within a single unique nest. With current outside monitoring protocols, this performance indicator has not been measured, but under current and future nest camera monitoring protocols, this indicator can be obtained.
* *Egg survival* – Probability of an egg surviving daily (daily survival) or to hatch (incubation survival). With current outside monitoring protocols, this performance indicator has not been measured, but under current and future nest camera monitoring protocols, this indicator can be obtained.
* *Fledges* – Number of plover chicks attributed to a unique nest that survive to 28 days of age.
* *Fledge ratio (fledges/breeding pair)* – Number of fledges produced divided by the estimated number of breeding pairs calculated annually over the entire AHR or for each nesting site.
* *Adult survival* – Annual probability of a uniquely marked individual adult surviving and being detected from one year to the next. Estimates of adult survival require continuous banding and resighting of birds, therefore this performance indicator is not currently being measured by Program monitoring efforts.

These new/additional performance indicators could be explored for their usefulness to assess the LT/PP management objective as follows:

1. Increase the number of fledged tern and plover chicks by:
   1. Increasing nesting pairs (indicator is breeding pairs); this could be accomplished through increasing acres of habitat or others management actions. The GC agreed to add an additional 60 acres of nesting habitat during the Extension.
   2. Decrease losses to predation (indicator is daily nest and brood survival, nests and broods fated as Failed Predated); this could be accomplished through predator management or increasing acres of habitat.
   3. Increase fledge ratio (indicator is fledges successfully produced per nest or breeding pair); this could be accomplished through predator management or potentially continuing to add additional acres of habitat.
2. Reduce adult mortality
   1. Decrease losses to predation (indicator is adult mortality attributed to predation); this could be accomplished through predator management or increasing acres of habitat.

In terms of communicating the measure of relative success of Program actions while ensuring the LT/PP management objective continues to be met during the Extension and beyond, the AMWG is interested in exploring the possibility and effectiveness of using the tool of risk analysis (Consequence (C) ratings, Likelihood (L) ratings, Risk (CxL) ratings, color-coded risk matrices) to identify performance indicator red flags. These would be longitudinal red flags, meaning over some longer time increment rather than concern about intra-annual changes in productivity metrics. To communicate with the GC, risk ratings could be reported (based upon consequences to the target species and likelihood of failure to meet the management objective) based on categories of risk: if a performance indicator falls into a **green range**, nothing to see here; if an **orange range**, we are good but keeping an eye on things; or if a **red range**, the TAC recommends research or changes to management actions. The EDO, in consultation with the AMWG, the TAC, and the ISAC, would still assess annually in the *State of the Platte Report* whether the Program is meeting the management objective but that would be weighed against expected changes over time.

**TASK 3: IDENTIFY IMPORTANT LT/PP TECHNICAL UNCERTAINTIES AND DEVELOP POTENTIAL PRIORITY HYPOTHESES**

The AMWG discussed potential priority hypotheses relative to uncertainty linkages in the revised LT/PP conceptual model. Will include a summary of that discussion here in the Extension Science Plan.

**TASK 4: DEVELOP A NEW SET OF LT/PP BIG QUESTIONS FOR THE EXTENSION**

The AMWG focused discussion on remaining areas of uncertainty related to PP productivity over time.

**Big Questions = things we do not know but want to learn**

1. **Why did PP productivity numbers decline from 2017-2019?**

Based on the results of annual Program monitoring, PP productivity declined over the three-year period from 2017-2019. Although productivity numbers increased during the 2020 nesting season, Program participants still expressed concern over the previous decrease. The Program is not certain of the cause for this episodic productivity decrease, leading to the exploration of predation as one possible cause. As noted by AMWG members, breeding bird literature indicates weather patterns, forage availability, habitat structure, and other factors can be important.

*Uncertainty Factor = Predation*

The AMWG identified the impacts of predation on plover productivity and the Program’s ability to mitigate this impact as an area of remaining uncertainty for which negative impacts on productivity have been documented and the Program has the ability to manage. There is uncertainty with types of predation (avian or terrestrial) and predation intensity (single predator, or chronic predation). The AMWG discussed alternative management and monitoring strategies for addressing this uncertainty.

Relative to predation, a question of interest: What is the impact of predation types on PP productivity and how can the Program reduce the impact of predation on PP productivity?

*Uncertainty Factor = Forage*

The AMWG engaged in a discussion about PP forage availability (invertebrates along wetted habitat perimeters, both on- and off-channel) as another possible factor in the recent PP productivity decrease. Little is known about the type and abundance of invertebrate forage available to PP on the central Platte each summer, though there is concurrently little data suggesting that PP fitness is in decline or can be attributed to summer forage availability on the central Platte. This may be something of interest if, for example, risk analysis tools flag this as a concern or further evidence suggests a decline in PP body condition.

Relative to forage, a question of interest: Are there enough forage resources on off-channel habitat PP nesting sites to maintain PP productivity, what influences forage resource availability on off-channel sites, and how can the Program implement management actions to improve forage availability?

**REVISING THE EXTENSION SCIENCE PLAN**

At this time, the AMWG is continuing to explore additional new Big Questions and specific priority hypotheses related to the PP for the Extension to be addressed through a rigorous application of the adaptive management (AM) six-step cycle. There may be additional areas of uncertainty related to PP use of and productivity on the AHR identified during continued development of the Extension Science Plan in 2021 or during subsequent implementation of the Science Plan that might require review and development of an AM approach to address related uncertainty. For now, the AMWG will work with the EDO to further identify, refine, and specify additional PP Big Questions and priority hypotheses for the Science Plan and determine areas of uncertainty to be reduced through application of AM and other PP issues that may be better explored through a more traditional approach to monitoring status and trends over time.

**REFERENCES CITED**

Baasch DM, Hefley TJ, Cahis SD. 2015. A comparison of breeding population estimators using nest and

brood monitoring data. *Ecology and Evolution* 5(18): 4197-4209. <https://onlinelibrary.wiley.com/doi/10.1002/ece3.1680>

**FOR FURTHER SCIENCE PLAN DEVELOPMENT DISCUSSION:**

**Table 1** below is a set of higher order “parking lot” AMWG discussion topics moving forward into development and refinement of the LT/PP section of the Extension Science Plan. Editorial, grammar, and finer-scale edits have been integrated into the document above. The AMWG member comments below are the result of in-meeting discussions and written feedback on earlier versions of this LT/PP summary document. The issues below will be addressed during subsequent AMWG meetings and through the process of developing and refining the Extension Science Plan. Areas of agreement/disagreement and issue resolution will be added to the “Extension Science Plan Resolution” column over time.

**Table 1.** AMWG comments on LT/PP language for Extension Science Plan.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Text Location** | **Key Text/Issue** | **AMWG Comment from:** | **Comment** | **EDO Comment/Response** | **Extension Science Plan Resolution** |
| Line 1 | General comment | Jeff Runge | The content continues to lead us down a narrow path of direct predator management on OCSW which I believe is too narrow of a scope. We should consider all management actions that could improve performance indicators, and then propose to the GC which one should be investigated further: 1) effects of management actions would be described in CMs, 2) differences in best professional judgement on CMs would be hypotheses, and 3) priority hypotheses could then be expanded into Big Questions. | Have updated the structure of this summary document to better match the task process identified in front matter of this document. The AMWG discussed the LT/PP conceptual model (CM) in the fall of 2020. Several AMWG members were tasked with reviewing the CM and providing revisions and more detail on potential uncertainty linkages for further exploration. General summary of that discussion was the CM was in good shape and no additional uncertainty linkages were identified beyond the issue of predation and its impacts on PP productivity. The AMWG discussed possible priority hypotheses, most of discussion focused on issues of predation, whether to employ active AM or passive AM, or whether additional predator management fell into an AM framework at all. AMWG can re-visit if necessary if additional uncertainties, hypotheses, and/or management actions need to be detailed and discussed. |  |
| **Text Location** | **Key Text/Issue** | **AMWG Comment from:** | **Comment** | **EDO Comment/Response** | **Extension Science Plan Resolution** |
| Line 28 | “*Evaluate and refine conceptual models…”* | Jojo La | Suggest adding language to indicate that this task was to “identify areas and relationships *within the Program’s control* with uncertainty needing further investigation”. Is the above true? | This language comes directly from the August 2020 EDO memo to the GC regarding re-establishment and operation of the AMWG. This language was included in response to questions from at least one AMWG member along the lines of “what is the objective of the work of the AMWG?” Recommend leaving as-is. Likely will include this language at the beginning of the Extension Science Plan as part of a description of the process of developing the Science Plan. |  |
| Jim Jenniges | I do not think the AMWG is confined by needing to evaluate only uncertainties the Program can control but reality the management actions taken by the Program have to fit within the side boards that have been established. See the Program document at Section III.C.1 |
| Line 45 | “…serve as a roll-up…: | Jeff Runge | The science plan appears to be out of sequence. Big Questions are dependent on hypotheses, and hypotheses are dependent on conceptual models. We have a Big Question but no discussion on conceptual models or hypotheses. Are the relationships described here inaccurate, or is the AMWG working outside of the intended described progression of CMs, hypotheses, BQs? | Have updated the structure of this summary document to better match the task process identified in this section. The AMWG discussed the LT/PP conceptual model (CM) in the fall of 2020. Several AMWG members were tasked with reviewing the CM and providing revisions and more detail on potential uncertainty linkages for further exploration. General summary of that discussion was the CM was in good shape and no additional uncertainty linkages were identified beyond the issue of predation and its impacts on PP productivity. The AMWG discussed possible priority hypotheses, most of discussion focused on issues of predation, whether to employ active AM or passive AM, or whether additional predator management fell into an AM framework at all. AMWG can re-visit if necessary if additional uncertainties, hypotheses, and/or management actions need to be detailed and discussed. |  |
| **Text Location** | **Key Text/Issue** | **AMWG Comment from:** | **Comment** | **EDO Comment/Response** | **Extension Science Plan Resolution** |
| Lines 46 and 78 | Several comments on LT/PP management objective | Jeff Runge | Meeting the management objective was posed to the AMWG as a simple yes/no question. However, it is stated above that: *management objectives are a means to evaluate effectiveness of different Program actions within an adaptive management framework*. I would suggest we reconcile this within the AMWG, and then address this comprehensively in this document. | Important issue of how science learning is tracked, assessed, and communicated to the GC. Needs further discussion within AMWG and pertains to all management objectives. |  |
| Line 89 | “It is the consensus opinion…” | Jeff Runge | Consensus is conditional. There was agreement with how we measured success on just the opening statement: *Improve production of Least Tern and Piping Plover from the central Platte River*. However, we answered the question without consideration of the above bullets and sub-bullets under the management objective. If the below bullets are to align with above bullets, then we would need an expanded discussion to match with the bullets above.  Proposed edit – “The AMWG suggests that the GC adopt the following proxies to assess whether the PRRIP is meeting the LT/PP management objective.” | Important issue of how science learning is tracked, assessed, and communicated to the GC. Needs further discussion within AMWG and pertains to all management objectives. |  |
| Line 50 | “…TAC will be responsible…” | Jojo La | Above it states that the AMWG should “take ownership of content in the Extension Science Plan.” Who is responsible for the Science Plan, TAC or AMWG? | The EDO wants the AMWG to take ownership of the Science Plan in order to get input from Program participants that can hold up to further scrutiny (TAC, ISAC, etc.). The EDO could write the document internally and seek TAC review later but that is a process we are trying to avoid. The TAC is an official Program advisory committee so a recommendation to the GC for review and approval would need to come from that full committee. Recommend leaving as-is. |  |
| **Text Location** | **Key Text/Issue** | **AMWG Comment from:** | **Comment** | **EDO Comment/Response** | **Extension Science Plan Resolution** |
| Lines 60-64 | “Neither the Final Program Document nor the AMP…”  “…who determines if the Program is meeting…” | Jojo La | Is this not the final determination of the GC based on science and recommendations of the technical committees? | The EDO included this language because it is not specified in the AMP or the broader Program Document. The AMP management objectives are a product of AMP development and are only referred to as a “preliminary list.” No specific language is included in the Program Document or AMP stating how, or if, to assess whether or not the Program is meeting the AMP management objectives. |  |
| Jim Jenniges | The Program document and it is relative to a 1997 baseline. |
| Line 64 | “The EDO intends to work…” | Jojo La | Hasn’t this been previously documented in the State of the Platte Reports? Who determined the status of the management objectives before? I thought the GC? | Currently, “meeting” or “not meeting” the management objectives is an assessment made by the EDO in the State of the Platte. Those assessments are discussed with the TAC and ISAC, but it is left to the EDO to make the assessment. Moving forward, the EDO would like these assessments to be made more collaboratively with the AMWG and TAC to make the process more iterative and a more common practice within the Program. Potentially using tools such as risk analysis could make this process more engaging for AMWG and TAC members. |  |
| Line 87 | “…relative to a 1997 baseline…” | Jojo La | Adding the phrase “relative to a 1997 baseline” (here and in other places in the document). | Added phrase but need to clarify if this is the understanding of the full AMWG. This comment was raised by more than one AMWG member. |  |
| **Text Location** | **Key Text/Issue** | **AMWG Comment from:** | **Comment** | **EDO Comment/Response** | **Extension Science Plan Resolution** |
| Line 98 | “Eggs produced” | Jim Jenniges | We have collected this data in the past what was it used for? I think this and egg survival should be recorded if visiting the nest, I do not think we should endanger a nest by collecting it. | Nest monitoring cameras were set up in 2020 to document predation at nests. Cameras were placed 7-10 feet from nests and remained there for the length of incubation to minimize disturbance. That same imagery can be used to document eggs produced and egg survival. |  |
| Line 100 | “…under current and future…” | Jim Jenniges | I missed part of the discussion and maybe this was discussed then. To date we have used cameras to get band combinations and predator assemblages and during that time have had decreased reproductive output. I think whole-scale use of cameras on nests needs to be evaluated and is not something I would recommend. | Of the 46 nests with nest cameras monitored in 2020 on 5 OCSW sites, 78% were successful vs. 22% failed. Of the 78 nests without nest cameras monitored in 2020 at these same 5 OCSW sites, 71% were successful vs. 29% failed. Camera monitored nests were not predated or abandoned more often than nests without cameras. In light of current Program data, careful review of the published literature on camera/video monitoring of nesting birds, and one on one conversations initiated by the EDO with the authors of these published works, the EDO does not have evidence to suggest that use of remote cameras for nest monitoring increases risk of predation. |  |
| **Text Location** | **Key Text/Issue** | **AMWG Comment from:** | **Comment** | **EDO Comment/Response** | **Extension Science Plan Resolution** |
| Line 102 | “red flag” | Jeff Runge | Again, I am assuming that Program management objective is a yes/no answer. Also, assuming that the standard of one extra chick was fledged compared to the 1998 baseline, then the red flag is a warning for what? It is not a warning that we are at risk of getting a “no’ on the management objective. In my opinion, a downward trend indicates a reduction in production which is independent from the yes/no question of whether Program is meeting management objective. | Important issue of how science learning is tracked, assessed, and communicated to the GC. Needs further discussion within AMWG and pertains to all management objectives. |  |
| Line 107 | “Adult survival” | Jim Jenniges | While this was brought up it would require actions far outside the scope of the PRRIP. | Agree, would require actions currently beyond the scope of the Program. |  |
| Dave Zorn | I agree with Jim. Although some of our actions could help ensure adult survival (i.e., predator control) we cannot apply this to annual survival with our current monitoring but rather simply monitor the adults and potential causes of mortality while they are here as indicated in b) i). |
| Line 125 | “These new/additional performance…” | Jeff Runge | Proposed edit – “These new/additional performance indicators will be used to measure relative success of Program actions while ensuring management objective continues to be met. The below bullets provide examples of how certain management actions can improve performance indicators. Performance indicators will be incorporated into conceptual models which will aid in the development of priority hypotheses and Big Questions.” | As noted earlier, the AMWG went through the process of discussing and attempting to further refine a revised CM, and also discussed remaining uncertainty linkages and potential priority hypotheses. Needs further discussion within the AMWG as to whether that process should be repeated to address additional areas of uncertainty, hypotheses, and/or management actions. |  |
| **Text Location** | **Key Text/Issue** | **AMWG Comment from:** | **Comment** | **EDO Comment/Response** | **Extension Science Plan Resolution** |
| Line 127 | “…AMWG is interested in exploring…” | Jim Jenniges | Again, I missed some of the discussion so may have missed this. What would be the goal of this? Under the Program as long as the milestones are being met it is the responsibility of the FWS to make the determination the Program no longer results in ESA compliance. Presumptively the FWS would let the GC know things are not good and why prior to making that determination. This process has the potential to raise red flags that are not needed. | The idea of using a tool like risk analysis was raised with the AMWG by the EDO as a potential means for communicating the results of Program science learning and progress toward meeting the management objectives to the GC. As mentioned earlier, there is no means specified in the Program Document for how this communication is to occur. In the Second Increment Policy Frame Document, the GC agreed that one question to be wrestled with during the Extension is how best to communicate science learning to the GC. The AMWG generally agreed this idea is worth further exploration during development of the Science Plan. |  |
| Line 148 | “…leading to the exploration of…” | Jim Jenniges | I think this statement implies a lot more uncertainty than actually exists. Listing a nest fate as unknown is not the same as saying we do not know what is happening. We just do not know if that nest was successful (hatched) or predated prior to hatch. | High numbers of nests and broods are fated as failed unknown each year (87 in 2019, 58 in 2020). AMWG members identified this as an area where more information is necessary to reduce uncertainty about the causes for these losses. Information that allows us to differentiate among losses due to predation vs. other factors that contribute to unknown fates such as flooding, weather, and abandonment will help quantify impacts and direct management accordingly. |  |
| **Text Location** | **Key Text/Issue** | **AMWG Comment from:** | **Comment** | **EDO Comment/Response** | **Extension Science Plan Resolution** |
| Line 157 | “…in a systematic way…” | Jim Jenniges | This could be interpreted to mean an experiment or research and I thought the AMWG ended up at implement the appropriate measures at any given site and use the monitoring to evaluate effectiveness? | Systematic implementation of management actions at sites with high losses to predation and high predator presence can reduce variability and provide more information specific to address effectiveness of management actions. |  |
| Line 166 | “1) Why did…” | Jeff Runge | For me, the big question would be framed differently. I believe there is broad agreement that decline is attributed to predation. The biggest question for me whether we conduct active AM or passive AM to address predation given uncertainties. There was discussion about applying treatments to understand control (active) or just implement and monitor (passive). The above Big Question pertains to just egg/chick loss at OCSW. In consideration of my opening comment, do we go down a narrow path of egg/chick loss at OCSW or is the scope broader? | Needs further discussion within the AMWG and how to treat this issue in the Science Plan. |  |
| Line 169 | “fitness decline” | Jim Jenniges | We have no measure of fitness other than chick survival and I would not support the kind of effort it takes to get that (i.e., catching chicks on a regular basis) | A reduction in PP body condition (i.e., body mass) is the appropriate indicator. The EDO agrees that obtaining this information is inconsistent with current monitoring protocols. |  |
| **Text Location** | **Key Text/Issue** | **AMWG Comment from:** | **Comment** | **EDO Comment/Response** | **Extension Science Plan Resolution** |
| Line 174 | “…management actions to improve forage…” | Dave Zorn | If we do not apply pre-emergent herbicide at nesting sites, vegetation encroachment will quickly result in them no longer being suitable habitat. I doubt we are going to start releasing macro-invertebrates at these sites. Therefore, I am not sure what management actions would be available to the Program even if you were able to conclude that the sites were bug limited. |  |  |
| Andy Caven | There are a number of potential management actions from making shallower slopes on island edges, to intentionally inundating shorelines through mechanical means that theoretically could influence forage abundance. There may even be an impact based on the time of year islands are disked or *when* they are treated with preemergent. There is also a wide selection of preemergent herbicides to choose from. Saying “program management actions cannot influence macroinvertebrate abundance on off-channel islands” is a null hypothesis, with the alternate hypothesis being that they can. We have not given this topic ample thought, nor explored the actions that could potentially increase Plover forage abundance. |