Extension Science Plan

Malinda Henry PRRIP Science Lead

PLATTE RIVER
RECOVERY IMPLEMENTATION PROGRAM

Science Plan

PRRIP Extension Big Questions (EBQ)
Extension Science Priority – Active Learning
EBQ #1 – How effective is it to use Program water to maintain suitable whooping crane roosting habitat?
EBQ #2 – How effective is Program management of Phragmites for maintaining suitable whooping crane roosting habitat?
EBQ #3 – Is sediment augmentation necessary to create and/or maintain suitable whooping crane habitat?
EBQ #4 – Does flow influence WC decision to stop or fly over the AHR?
EBQ #5 – Does flow influence WC stopover length within the AHR?
EBQ #6 – Why is spring WC use of the AHR greater than fall WC use?
EBQ #7 – What effect do Program flow management actions to benefit WC, PP, and LT in the central Platte River have on pallid sturgeon use of the lower Platte River?
Extension Science Priority – Maintenance Learning
EBQ #8 – How much of an effect does predation have on PP productivity?
EBQ #9 – How effective is Program management at mitigating losses of PP productivity due to predation?
EBQ #10 – Wet meadows research *(NOTE: this is a carryover task from the First Increment to address physical processes involved in wet meadow hydrology)*

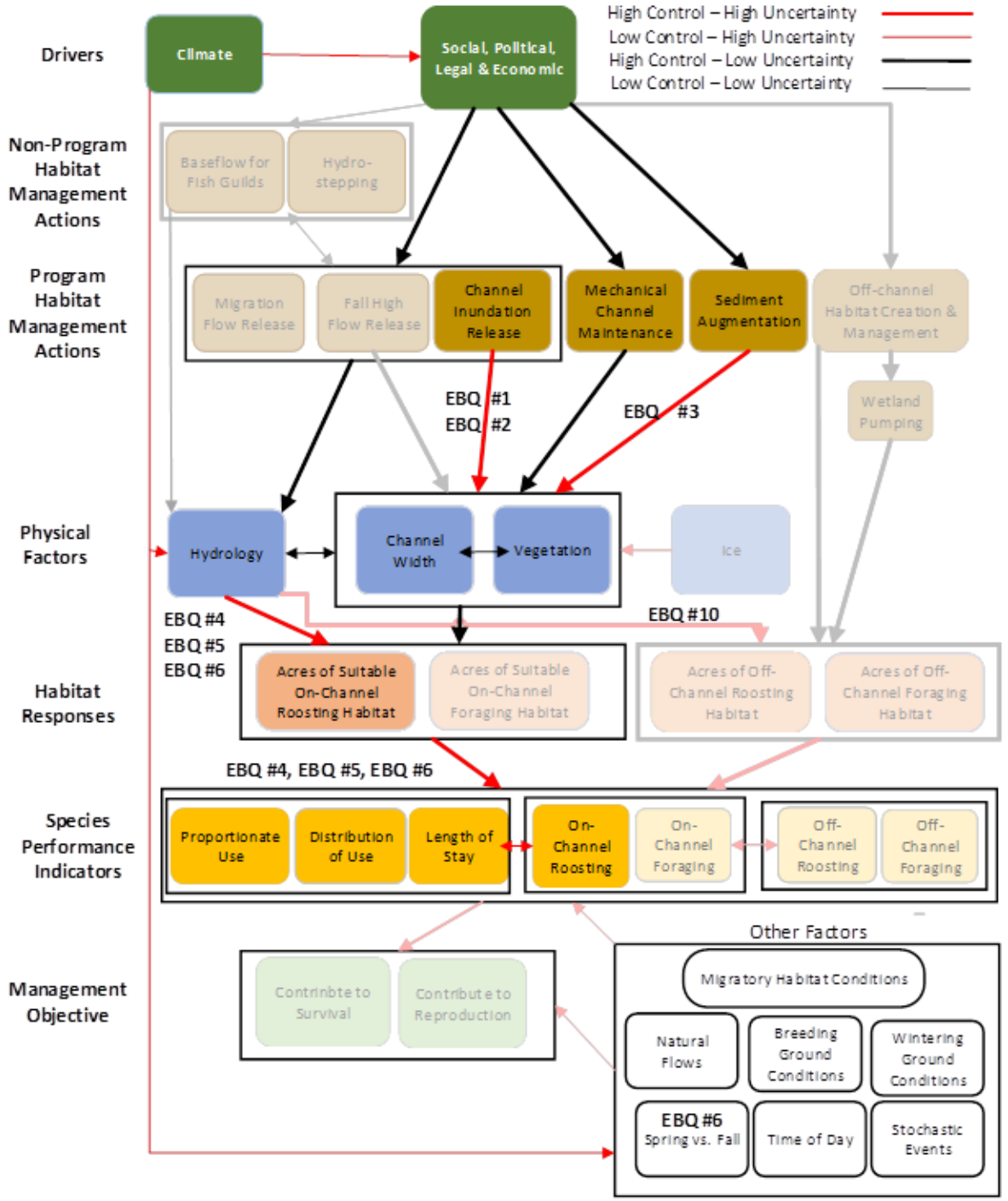
PLATTE RIVER
RECOVERY IMPLEMENTATION PROGRAM

Attachment #1: Check-in on First Increment Learning

PRRIP Big Question	2019 Assessment	Reassessment Triggers*
Implementation – Program Management Actions and Habitat		
1. Will implementation of SDHF produce suitable tern and plover riverine nesting habitat on an annual or near-annual basis?		On-channel nesting on natural sandbar habitat following peak flow event(s)
2. Will implementation of SDHF produce and/or maintain suitable whooping crane riverine roosting habitat on an annual or near-annual basis?		Relationship between flow and whooping crane habitat is an Extension focus – will be addressed directly.
3. Is sediment augmentation necessary for the creation and/or maintenance of suitable riverine tern, plover, and whooping crane habitat?		Big Question carried forward into Extension – will be addressed directly.
4. Are mechanical channel alterations (channel widening and flow consolidation) necessary for the creation and/or maintenance of suitable riverine tern, plover, and whooping crane habitat?		Relationship between mechanical management actions and whooping crane habitat is an Extension focus – will be addressed directly.
Effectiveness – Habitat and Target Species Response		
5. Do whooping cranes select suitable riverine roosting habitat in proportions equal to its availability?		Whooping crane habitat selection analysis will be rerun on a five-year interval to identify changes in selection.
6. Does availability of suitable nesting habitat limit tern and plover use and reproductive success on the central Platte River?		Drop in piping plover breeding pairs per acre of suitable OCSW habitat below 1 breeding pair per 5 acres for 3 years in a row.
7. Are both suitable in-channel and off-channel nesting habitats required to maintain central Platte River tern and plover populations?		Increase in on-channel nesting with corresponding decrease in off-channel nesting.
8. Does forage availability limit tern and plover productivity on the central Platte River?		Observations of emaciated adults/chicks and/or drop in productivity (fledging) that is not attributable to weather or predation.
9. Do Program flow management actions in the central Platte River avoid adverse impacts to pallid sturgeon in the lower Platte River?		Pallid sturgeon questions will be directly addressed during the Extension as part of genetics and habitat research projects.
10. Do Program management actions in the central Platte River cumulatively 1) produce detectable changes in the physical environment (i.e., habitat) and 2) result in a detectable increase in tern, plover, and whooping crane use of the Associated Habitats?	**LTPP Off-Channel** Habitat:  Species Response: **WC On-Channel** Habitat:  Species Response: 	• LTPP Off-Channel: Drop in piping plover breeding pairs per acre of suitable OCSW habitat below 1 breeding pair per 5 acres for 3 years in a row. • WC On-Channel: Relative to 2007-2021, the distribution of proportional WC use of the AHR changes such that use of Program properties is less than predicted by its availability.

PLATTE RIVER
RECOVERY IMPLEMENTATION PROGRAM

Attachment 2: Conceptual Ecological Models & Priority Hypotheses



PLATTE RIVER
RECOVERY IMPLEMENTATION PROGRAM

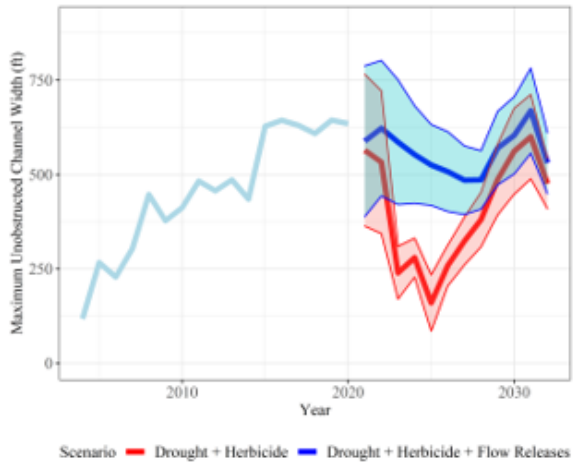
Extension Big Question #1: How effective is it to use Program water to maintain suitable* whooping crane roosting habitat?

**Channels with ≥ 650 ft maximum width unobstructed by dense vegetation (MUCW) are highly suitable for whooping crane roosting.*

Management Hypothesis: Releases to achieve a 30-day minimum flow target of 1,500 cfs between June 1 – July 15 will suppress germination, slow vegetation expansion into the channel, and increase the percent of AHR channel that remains highly suitable for whooping crane roosting (germination suppression release).

Assumes ongoing Phragmites spraying. Program science strongly indicates that natural peak flow events exceeding 13,000 cfs or mechanical vegetation clearing are necessary to remove vegetation and increase MUCW. Germination suppression releases are only hypothesized to maintain unvegetated width.

X-Y Graph



Based upon the Program's machine learning model, it is hypothesized that channel-inundating flow releases for at least 30 days (June 1-July 15; target 1,500 cfs) will suppress seed germination and slow loss of MUCW during drought periods absent natural peak flows of sufficient magnitude (>13,000 cfs) to naturally maintain and/or increase MUCW.

Alternative Hypotheses:

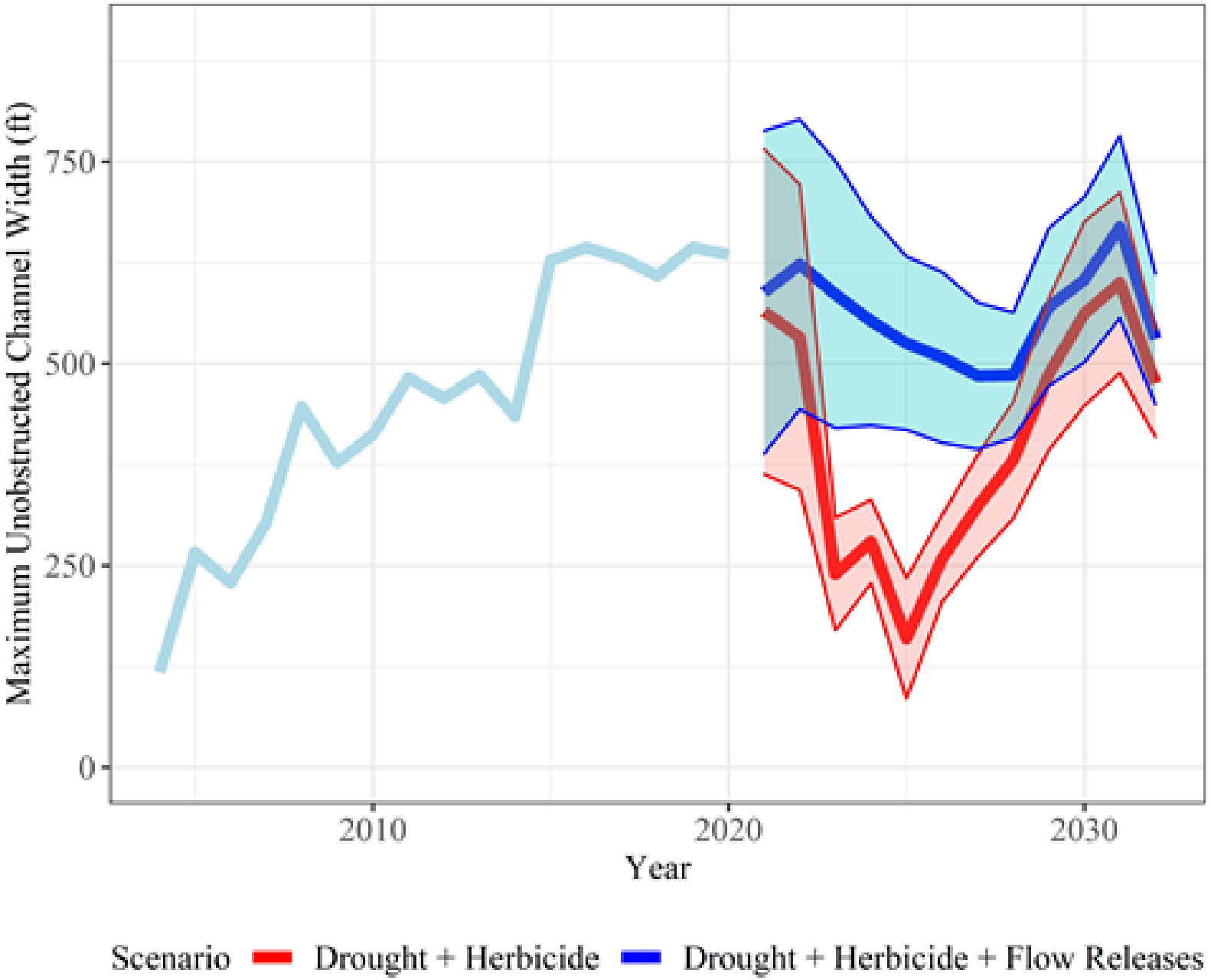
- 30-day inundation between June 1 – July 15 is insufficient – must maintain release throughout growing season
- The 1,500 cfs target is too much or too little to maintain suitable MUCWs.
- Hydrocycling increases/decreases effectiveness of germination suppression release
- Insufficient water and/or conveyance capacity to implement release.
- Ongoing *Phragmites* spraying (herbicide application) is primarily responsible for channel width maintenance by controlling rate of vegetation establishment. Herbicide kills vegetation and flow subsequently removes islands/dead standing biomass via lateral erosion.
- Mechanical vegetation clearing is necessary to maintain suitable MUCWs.
- Fall SDHF will scour < 1 year old seedlings and maintain suitable MUCWs.

Extension Big Question #1: How effective is it to use Program water to maintain suitable* whooping crane roosting habitat?

**Channels with ≥ 650 ft maximum width unobstructed by dense vegetation (MUCW) are highly suitable for whooping crane roosting.*

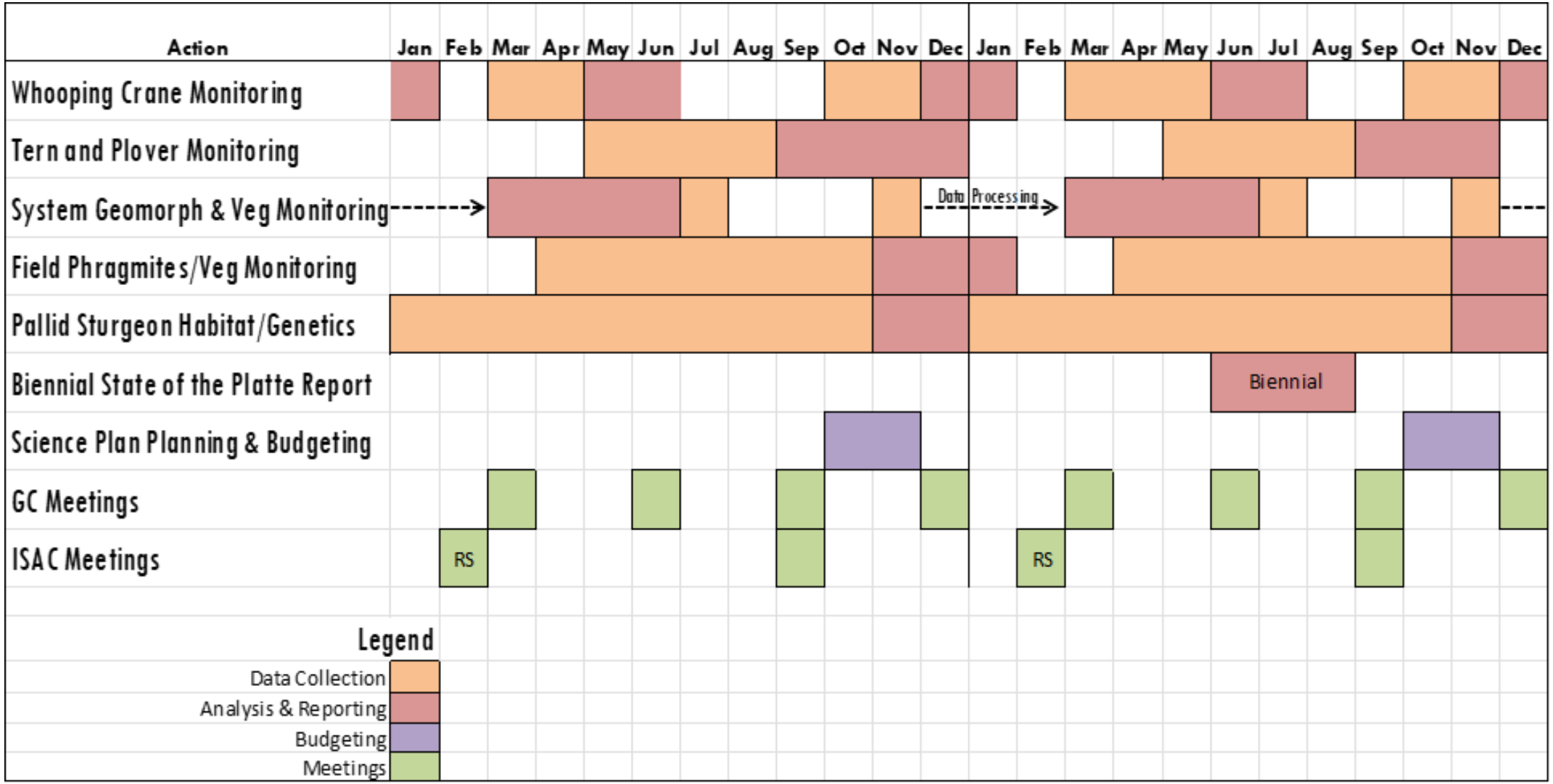
Management Hypothesis: Releases to achieve a 30-day minimum flow target of 1,500 cfs between June 1 – July 15 will suppress germination, slow vegetation expansion into the channel, and increase the percent of AHR channel that remains highly suitable for whooping crane roosting (germination suppression release).

Assumes ongoing Phragmites spraying. Program science strongly indicates that natural peak flow events exceeding 13,000 cfs or mechanical vegetation clearing are necessary to remove vegetation and increase MUCW. Germination suppression releases are only hypothesized to maintain unvegetated width.



PLATTE RIVER
RECOVERY IMPLEMENTATION PROGRAM

Attachment 3: Implementation Activities & Timeline

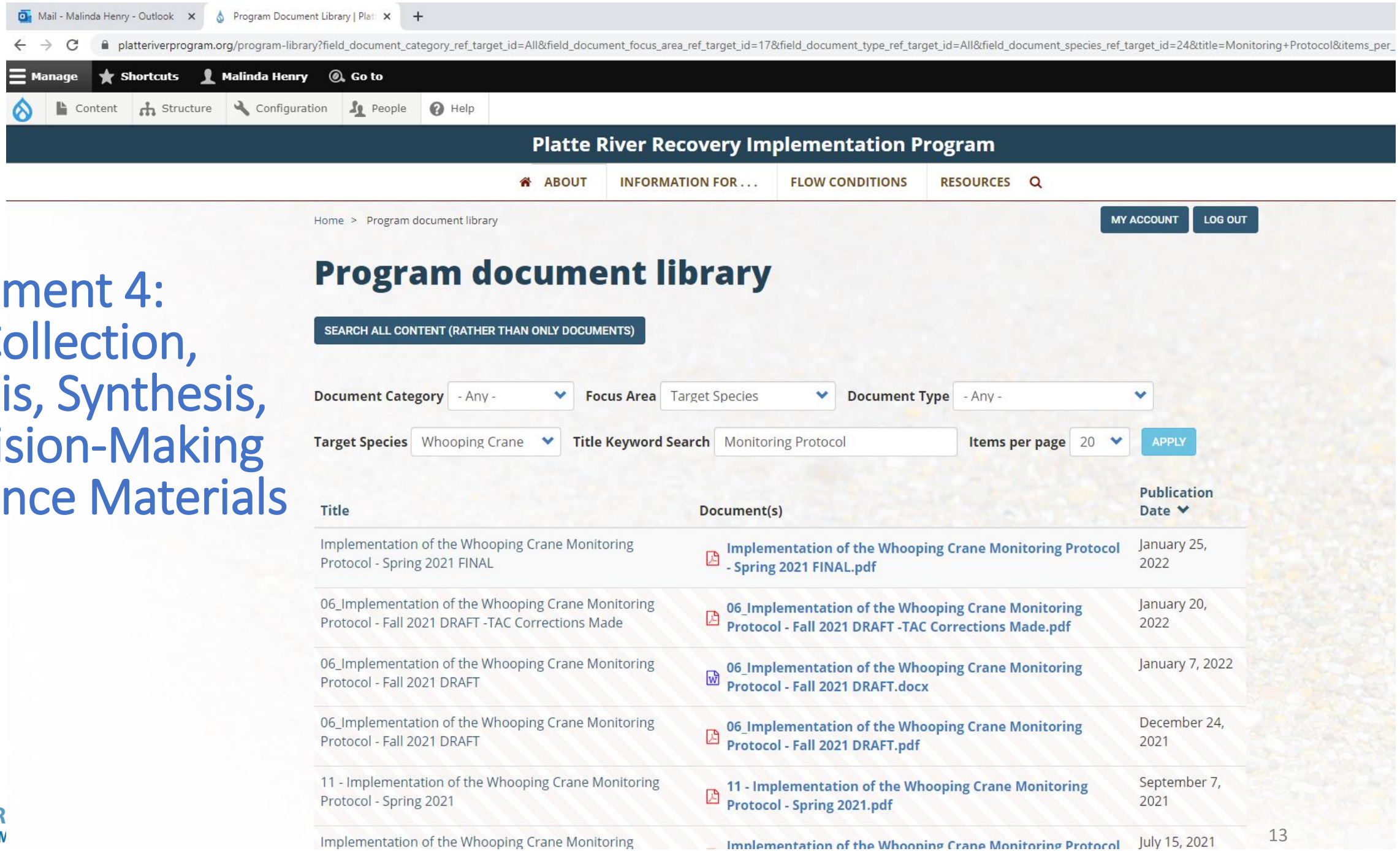


PLATTE RIVER
RECOVERY IMPLEMENTATION PROGRAM

Analysis/Synthesis Effort	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Vegetation Management Performance											
Sediment Augmentation											
WC Riverine Habitat Selection											
WC Telemetry - Stopover											
Pallid Sturgeon Habitat/Genetics		MS			MS/PhD						
PRRIP Water Management											
PP Habitat Selection & Predation											
SDM Tool Development											
Biennial State of the Platte Reports											
Required											
Optional											

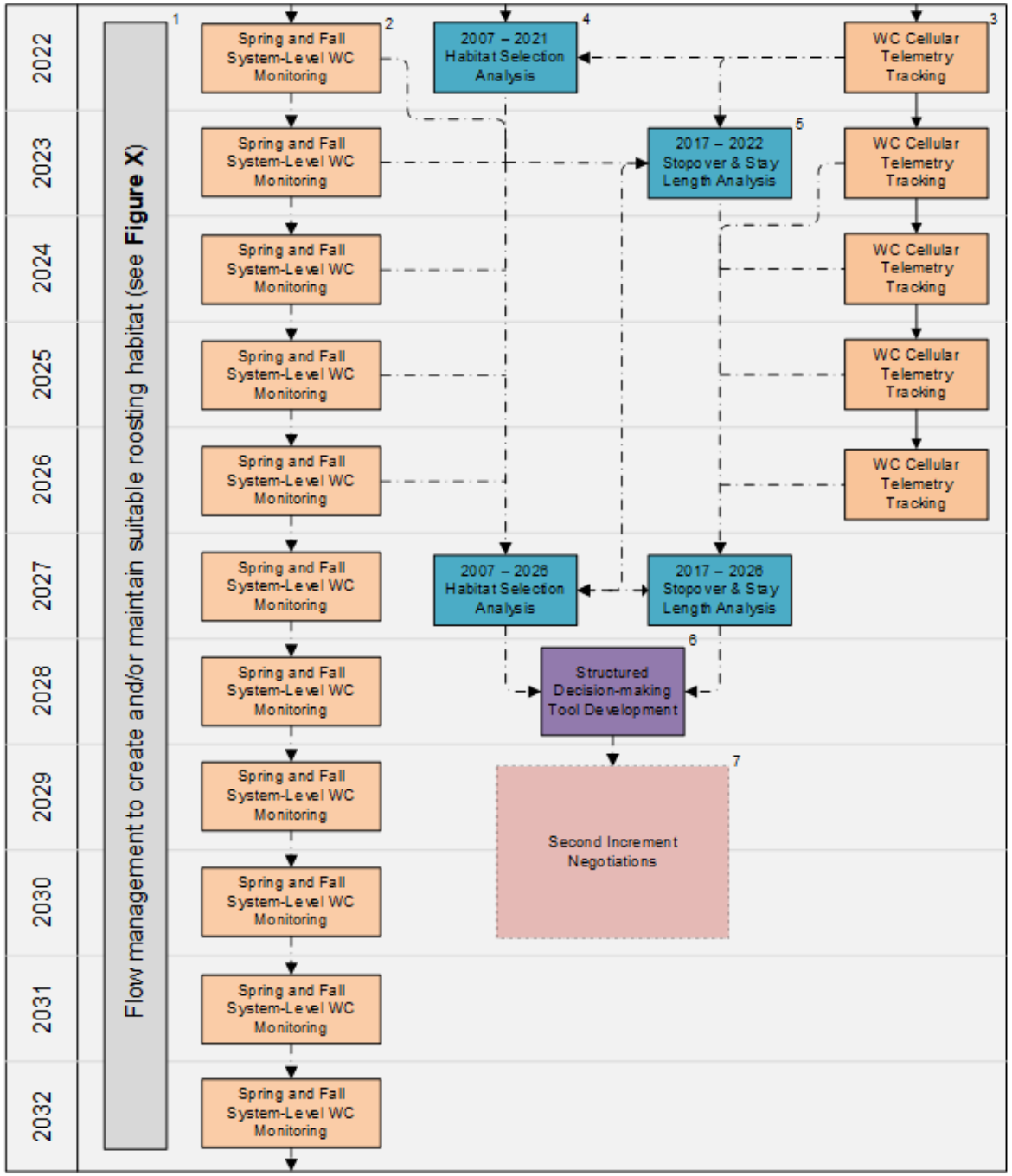
PLATTE RIVER
RECOVERY IMPLEMENTATION PROGRAM

Attachment 4: Data Collection, Analysis, Synthesis, & Decision-Making Reference Materials



PLATTE R
RECOVERY IM

Figure 7. Whooping Crane Activity Diagram.



Whooping Crane Activities – Attachment 3, Figure 7

The protocols for implementation and plans for data analysis and synthesis contained within this section are designed to address the following Extension Big Questions and to test the associated management hypotheses:

- ***EBQ #4 – Does flow influence WC decision to stop or fly over the AHR?***
- *Management Hypothesis:* Probability of WC stopping within the AHR is a function of discharge.
- ***EBQ #5 – Does flow influence WC stopover length within the AHR?***
- *Management Hypothesis:* Length of WC stopover within the AHR is a function of discharge.
- ***EBQ #6 – Why is Spring WC use of the AHR greater than Fall use?***
- *Management Hypothesis:* WC use of the AHR in the Spring is greater than during the Fall due to higher flows during the Spring.

7.1 Flow Management to Create/Maintain Suitable Roosting Habitat

5.1 Germination Suppression Implementation

Germination suppression flow releases have been implemented in 2020 and 2021. Associated activities will be formalized in an implementation plan prior to the 2022 release.

***OPTION:* 5.6 Alternative Vegetation Management Release Implementation**

6.1 Sediment Augmentation Implementation

Upon arrival of newly hired geomorphologist in March of 2022, the EDO will develop a plan for sediment augmentation. Initial plan expected by June of 2022.

Full-scale sediment augmentation has been implemented annually since 2017. However, a formal document for implementation has not been developed. The most current summary document can be found here: Sediment Augmentation Monitoring Brief

***OPTION:* 6.6 Alternative Sediment Management Implementation**

7.2 Spring and Fall System-Level Whooping Crane Monitoring

The Whooping Crane Monitoring Protocol is currently being updated. The link to our most recent approved protocol can be found below. An updated protocol will be provided by July of 2022.

Detailed methods for collection of WC use data for the AHR can be found in the PRRIP Whooping Crane Monitoring Protocol – Migrational Habitat Use in the Central Platte River Valley (2017)

7.3 Whooping Crane Cellular Telemetry Tracking

First Telemetry Tracking Partnership (2009-2018)

Telemetry data provided by this partnership consists of individual telemetry equipped whooping cranes providing locational data every 4-6 hours. Further information on how the data were obtained can be found in Pearse et al. 2020. More detailed methods on how the data from this partnership were utilized to address habitat selection by WCs can be found in Baasch et al. 2019.

Whooping Crane Cellular Telemetry Tracking Partnership (2017-present)

Telemetry data provided by this partnership consists of individual cellular telemetry equipped whooping cranes providing locational data every 15 minutes. The partnership provided and continues to provide

PRRIP Whooping Crane Monitoring Protocol – Migrational Habitat Use in the Central Platte River Valley (2017)

View | Edit | Delete

PRRIP Whooping Crane Monitoring Protocol – Migrational Habitat Use in the Central Platte River Valley (2017).docx

Document Type: Protocol
Document Category: Technical
Document Focus Area: Target Species
Target Species: Whooping Crane
Authors: EDO
Publisher: Platte River Recovery Implementation Program (PRRIP)
Tags
Technical Advisory Committee
Documents

Discussion Questions:

- Does the structure of Attachment #4 fit well with the Implementation Activities & Timeline document, facilitating communication of what will be done, when, and how we plan to address Extension Big Questions?

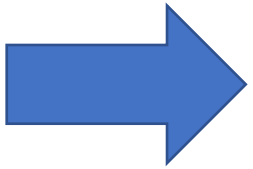
- Are the reevaluation triggers for 1st Increment Big Questions presented in Attachment #1 appropriate?

Attachment #1: Check-In on First Increment Learning

6. Does availability of suitable nesting habitat limit tern and plover use and reproductive success on the central Platte River?

10. Do Program management action in the central Platte River cumulatively
    1) produce detectable changes in the physical environment (i.e., habitat) and
    2) result in a detectable increase in tern, plover, and whooping crane use of the Associated Habitats?

Reassessment triggers:



- LTPP Off-Channel: Drop in piping plover breeding pairs per acre of suitable OCSW habitat below 1 breeding pair per 5 acres for 3 years in a row.
- WC On-Channel: Relative to 2007-2021, the distribution of proportional WC use of the AHR changes such that use of Program properties is less than predicted by its availability.

PLATTE RIVER
RECOVERY IMPLEMENTATION PROGRAM