



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

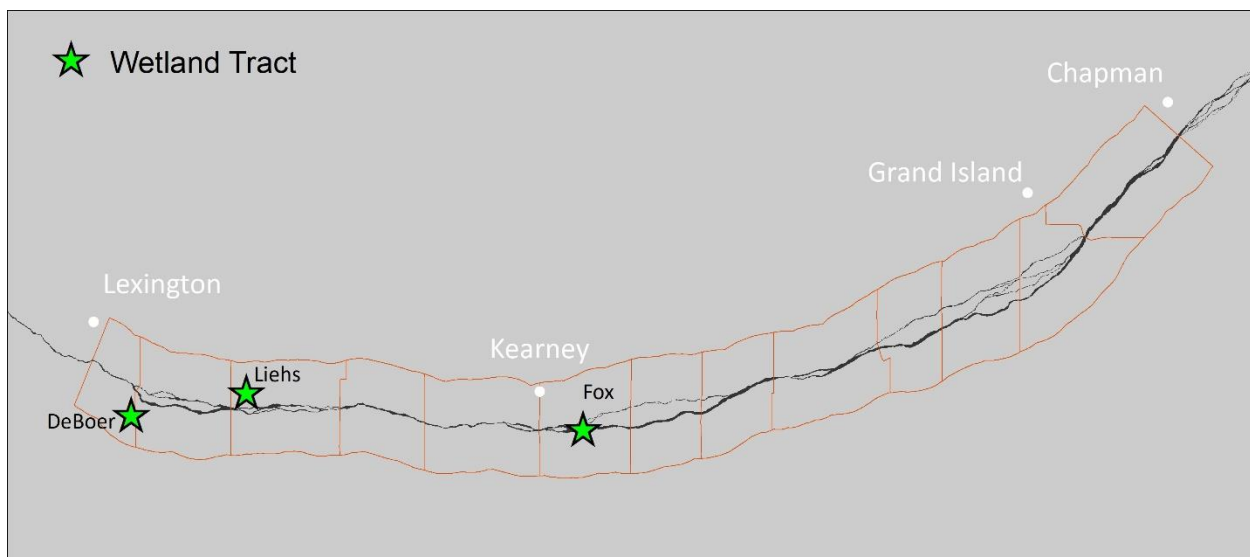
**TO:** PRRIP Governance Committee (GC)  
**FROM:** Executive Director's Office (EDO)  
**RE:** Disposition of Non-Complex Palustrine Wetlands  
**DATE:** October 1, 2021

### Requested GC Action (December 2021 Quarterly Meeting):

*1) Provide guidance on disposition and management of non-complex palustrine wetland tracts and palustrine wetlands on complex tracts during remainder of First Increment Extension.*

### Non-Complex Palustrine Wetland Background and Context

The Program's First Increment Land Acquisition Objective included 400 acres of off-channel (non-complex) palustrine wetland habitat to be acquired, restored, and managed as whooping crane roosting habitat. This off-channel roosting habitat was part of the mechanical creation and maintenance (MCM) strategy put forward as an alternative to creation and maintenance of riverine roosting habitat. The Land Advisory Committee evaluated several potential non-complex tracts early in Program implementation resulting in the acquisition of the DeBoer tract (2012004) in 2012 and the Liehs tract (2013001) in 2013 (Figure 1). In addition, palustrine wetland habitat was constructed on the Fox tract (2009001), a buffer property in the Fort Kearny Complex.



**Figure 1.** Non-complex palustrine wetland tracts (DeBoer & Liehs) and complex buffer habitat with palustrine wetland roosting habitat (Fox).

Subsequent focused efforts to identify and acquire additional tracts were unsuccessful due primarily to the lack of candidate restoration sites with suitable soils and hydrology. In 2016 the Governance Committee (GC) voted to not actively pursue acquisition of additional palustrine wetland tracts and to use remaining non-complex acres to acquire off-channel sand and water sites for tern and plover nesting. The Program continues to manage these tracts as whooping crane habitat, and in the case of



the Liehs tract, has also experimented with flooding cornfield during migration to assess crane response to that action.

Although the GC has not formally abandoned the off-channel palustrine wetland MCM strategy, the shifting of non-complex acres to OCSW and focus on creation and maintenance of in-channel whooping crane habitat effectively relegate these properties to legacy status. The remainder of this memorandum documents habitat restoration and maintenance costs and whooping crane response at these sites to inform GC discussion about the disposition and management of these properties during the remainder of the First Increment Extension.

## Palustrine Wetland Acquisition and Management

### Fox Tract (2009001)

The Fox tract is comprised of 182 acres and is categorized as buffer habitat in the Fort Kearny Complex in the Kearney to Minden bridge segment. A wet meadow construction project was completed in 2012 to create 69 acres of shallow wetlands, including one larger wetland footprint meeting Land Plan minimum criteria for palustrine wetland whooping crane roosting habitat. Construction consisted of excavation 121,346 cubic yards of spoil material that was spoiled along the perimeter of the tract. The site was seeded with site specific native seed mix and a new irrigation well with underground pipe and outlets to each wetland was installed to supplement water to the cells during spring and fall migration periods. Additionally, grazing infrastructure (i.e., perimeter fence, livestock water) improvements were completed to facilitate grazing as a vegetation management tool.

### DeBoer (2012004) and Liehs (2013001)

The 101 acre DeBoer tract was acquired in 2012 and the 153 acre Liehs tracts was acquired in 2013 as non-complex palustrine wetland habitat. Each tract contained cropland and semi-permanent, shallow bodies of water with appropriate depressional soils. Wetland rehabilitation projects were completed at both sites after acquisition.

The Liehs project involved building wetland berms and installing water control structures to move and hold water on the site, including the ability to flood crop residue to test the “flooded crop field” hypothesis for whooping crane migration. Flooding of the crop field occurred four times during the past seven years, once during spring migration (2019) and three times during fall (2016, 2017, 2018).

The DeBoer rehabilitation project involved tree clearing and sediment excavation to restore the wetland footprint. Irrigation infrastructure is in place on this property, but we do not currently have the capacity to fill the wetland. Additionally, grazing infrastructure (perimeter fence and livestock water) was installed to facilitate grazing as a management tool. Periodic grazing and spring & fall prescribed burning were implemented to manage vegetation height. Additional species management activities at each site include annual woody vegetation and noxious weed control including *Phragmites* and cattails.



## Acquisition, Restoration and Management Costs

Acquisition, restoration, and annual management costs for each tract are presented below in Table 1.

**Table 1.** Acquisition and restoration costs and approximate annual management costs and agricultural lease income by property.

| Property | Acres | Acquisition Cost | Habitat Restoration Cost | Approx. Annual Management and Property Tax Cost | Approx. Annual Ag Lease Income |
|----------|-------|------------------|--------------------------|-------------------------------------------------|--------------------------------|
| Fox      | 182   | \$582,443        | \$537,569                | \$17,271.91                                     | \$15,302.07                    |
| DeBoer   | 101   | \$376,000        | \$283,836                | \$6,754.13                                      | \$5,289.00                     |
| Liehs    | 153   | \$579,000        | \$110,831                | \$17,504.86                                     | \$20,732.86                    |

## Whooping Crane Use

### Data Sources

The Program has conducted aerial monitoring of whooping crane use of the Associated Habitat Reach (AHR) each spring and fall since 2007. In the fall of 2013, targeted systematic transects were set in place to directly monitor off-channel whooping crane habitat including the above-mentioned palustrine wetlands. In conjunction with aerial monitoring, the Program acquired telemetry data from the whooping crane tracking partnership (WCTP). The first telemetry project used satellite telemetry and consisted of 68 marked birds. Tracking was conducted from 2009-2018 and locational data were collected every 4 hours. The second telemetry project began in 2018, utilizing cellular telemetry to collect location data at approximately 15 to 30-minute intervals. The Program has received data from this second telemetry project up to Fall of 2020 including data for 51 unique birds.

All three sources of information were queried for documentation of whooping crane use of the three palustrine wetlands described above. In Table 2 below, "Use of Wetland" is defined as unique whooping crane groups on the ground within the palustrine wetland footprint. "Use w/in 16km Buffer of Wetland" includes locations of unique groups on the ground within 16 km of the property boundary, in accordance with the buffer used by [Baasch et al. 2019](#) as the distance over which whooping cranes could reasonably evaluate surrounding habitat based upon their in-flight field of view. These ground use locations were split into diurnal (7 am-7 pm) and roost locations (7 pm-7 am). A single crane group may contribute to both the diurnal use and the roosting counts, therefore counts should not be summed over diurnal and roost categories. Diurnal use relied upon both satellite and cellular telemetry datasets. Roosting locations were obtained from PRRIP aerial monitoring, satellite, and cellular telemetry datasets. "Flyovers w/in 16 km of Wetland after 3 PM" include only flight locations of unique groups within the 16 km buffer of each property boundary after 3 pm (when stopovers are more likely) that did not also have a ground location associated with them. Flyovers represent a non-selection for the available habitat at a time that cranes might start searching for stopover sites.

### Whooping Crane Use

To date the Program has not documented whooping crane use of the three palustrine wetlands (Table 2). A single register of a crane group within the DeBoer property boundary was found within the three datasets utilized, but crane use was within the agricultural field surrounding the wetland, not within the wetland itself. The 16 km area around Fox has received more whooping crane use than the areas surrounding DeBoer and Liehs wetlands (Figures 2-4). Due to the proximity of the DeBoer and Liehs



wetlands, whooping crane use within the 16km buffer surrounding each of these wetlands is largely duplicative (Figures 3-4). The number of groups that roosted in those buffer areas appears elevated when compared to diurnal use, but this is an artifact of including the Program aerial monitoring in the roosting dataset. Considering only the telemetry data for both types of use, nearly all of the groups that roosted also had a diurnal use location, balancing use of this buffer zone over diurnal use and nocturnal roosting.

**Table 2.** Whooping crane use of PRRIP palustrine wetland roosting habitat.

|        | Use of Wetland <sup>a</sup> |                    | Use w/in 16 km Buffer of Wetland |                    | <sup>d</sup> Flyovers w/in 16 km Buffer of Wetland after 3PM |
|--------|-----------------------------|--------------------|----------------------------------|--------------------|--------------------------------------------------------------|
|        | Diurnal <sup>b</sup>        | Roost <sup>c</sup> | Diurnal <sup>b</sup>             | Roost <sup>c</sup> |                                                              |
| Fox    | 0                           | 0                  | 8                                | 60                 | 8                                                            |
| DeBoer | 0                           | 0                  | 6                                | 13                 | 5                                                            |
| Liehs  | 0                           | 0                  | 6                                | 28                 | 1                                                            |

<sup>a</sup>Crane group located within the wetland footprint.

<sup>b</sup>Diurnal locations were defined as on the ground locations between 7am-7pm (daylight) and were acquired from satellite and cellular telemetry (2009 – 2020).

<sup>c</sup>Roost locations were defined as on the ground locations between 7pm-7am (dark) and were acquired from PRRIP aerial surveys, satellite, and cellular telemetry (2007 – present).

<sup>d</sup>Flyover locations were defined as locations with a speed >10km/h AND height above ground >10m OR speed >10km/h. Flyover data were acquired from the cellular telemetry dataset only (2018-2020).

## Preliminary Palustrine Wetland Policy Options

The EDO has developed a preliminary outline of potential palustrine wetland policy options for GC consideration. This discussion involves two primary levels of decision-making:

### 1) Disposition of non-complex palustrine wetland properties (DeBoer and Liehs)

- Keep properties and clarify management objectives for Extension
- Dispose of properties with or without conservation protections and consider reinvesting proceeds in complex and/or non-complex OCSW habitat.

In the case of the Fox tract, and/or if the GC decides to keep the non-complex tracts, a second level of decision-making is necessary:

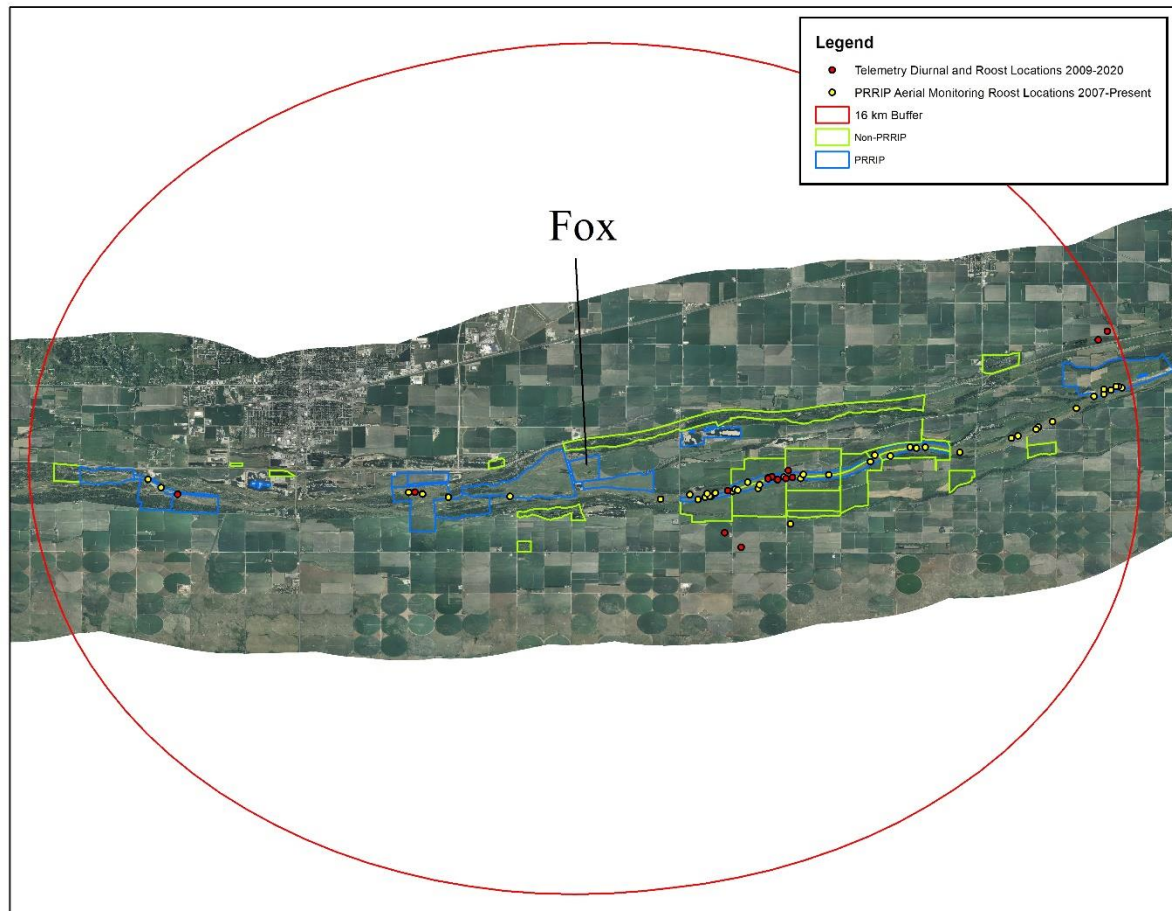
### 2) Habitat management objective during the extension

- Manage as whooping crane roosting habitat
  - Continue to pump/supplement water on Liehs and Fox tracts during WC migration periods?
  - Continue to periodically flood cropland on Liehs tract?
  - Develop supplemental water strategy for DeBoer?
- Manage for some other purpose
  - Other species of concern
  - Agricultural production
  - Other?

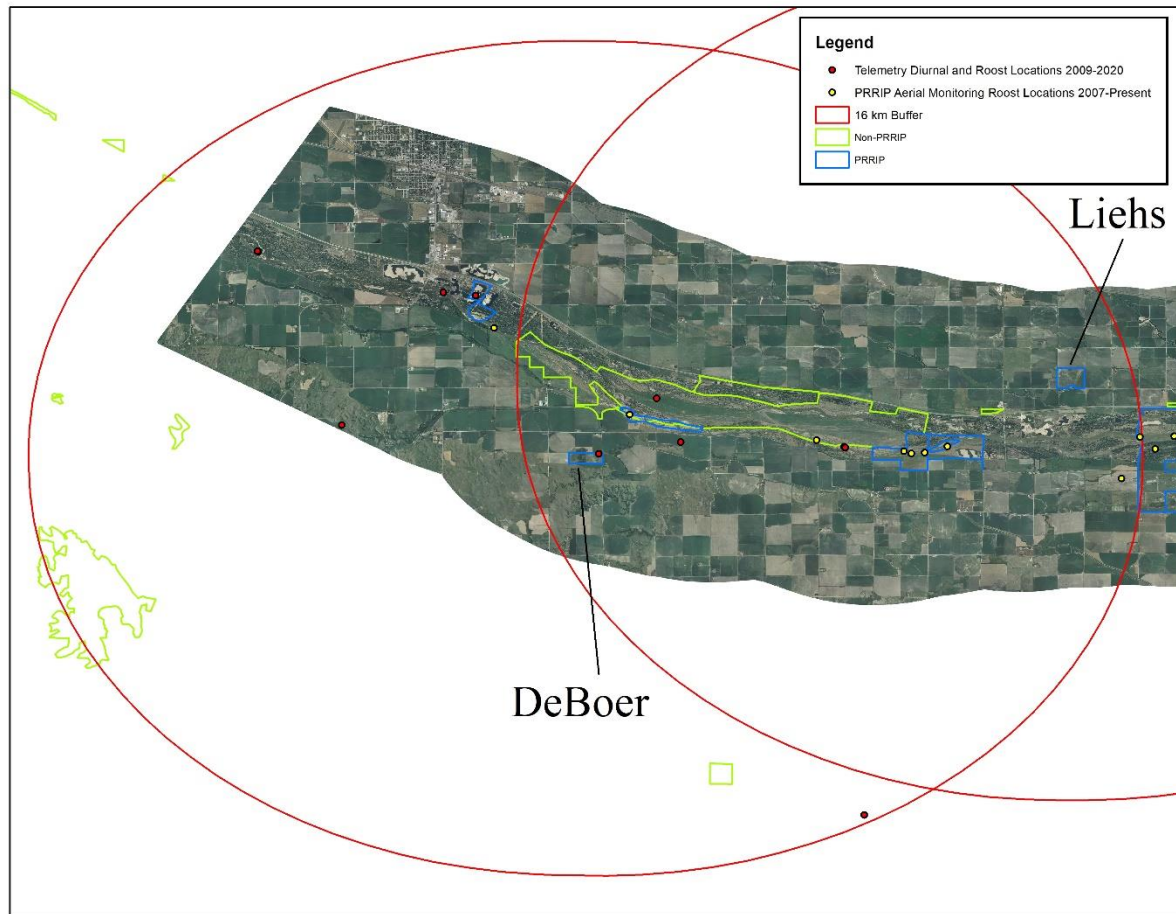
## References Cited

Baasch, DM; Farrell, PD; Howlin, S; Pearce, AT; Farnsworth, JM; Smith, CB. 2019. Whooping crane use of riverine stopover sites. *PLOS ONE*. <https://doi.org/10.1371/journal.pone.0209612>

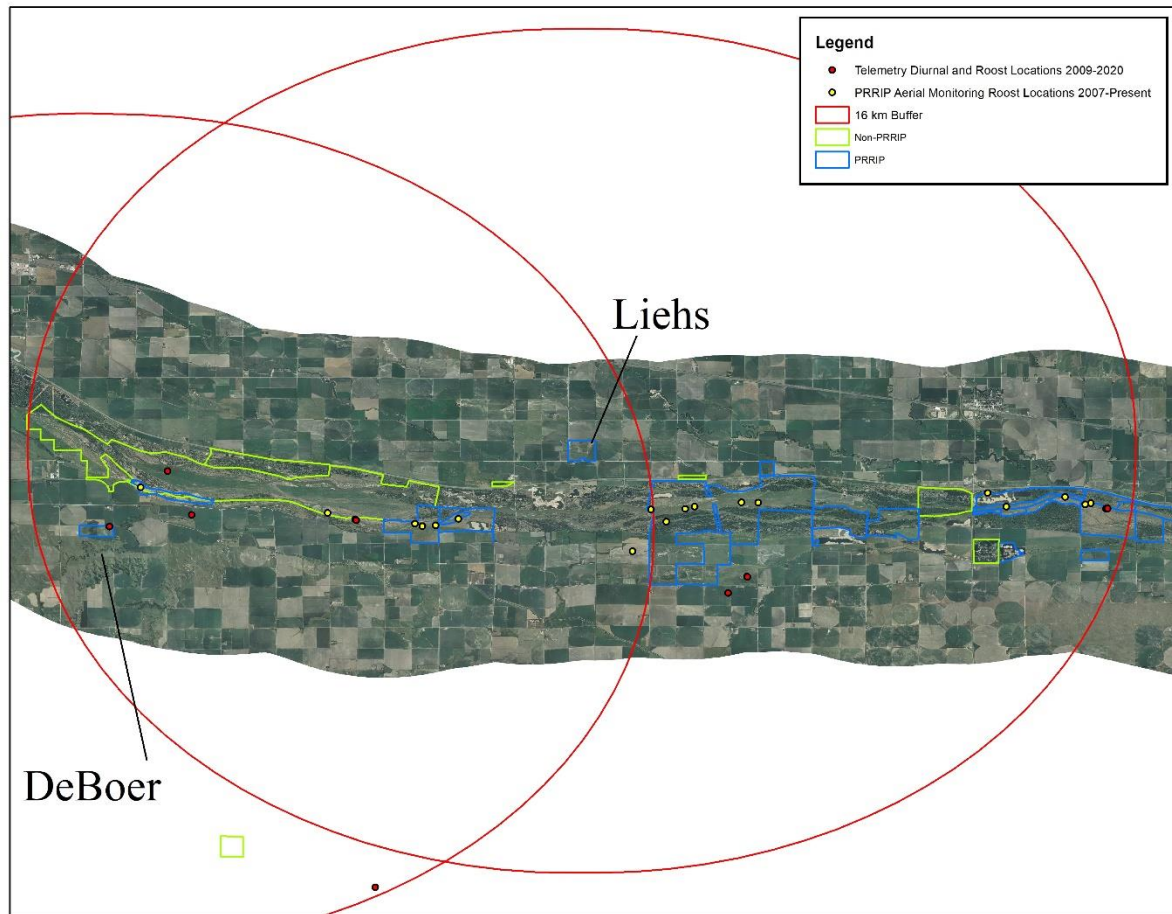
## Figures



**Figure 2.** Aerial image of the Fox wetland and 16km surrounding area (red circle) with ground locations of unique whooping crane groups obtained from the Program's monitoring efforts from 2007- present (yellow points) and telemetry data from both satellite (2009-2018) and cellular (2018-2020) marked birds (red points).



**Figure 3.** Aerial image of the DeBoer (and Liehs) wetland and 16km surrounding area (red circle) with ground locations of unique whooping crane groups from the Program's monitoring efforts from 2007-present (yellow points) and telemetry data from both satellite (2009-2018) and cellular (2018-2020) marked birds (red points).



**Figure 4.** Aerial image of the Liehs (and DeBoer) wetland and 16km surrounding area (red circle) with ground locations of unique whooping crane groups from the Program's monitoring efforts from 2007-present (yellow points) and telemetry data from both satellite (2009-2018) and cellular (2018-2020) marked birds (red points).