



PRRIP – ED OFFICE MEMORANDUM

TO: Technical Advisory Committee
FROM: Executive Director's Office
SUBJECT: UNK Research Proposal – PRCF Response to Vegetation Removal
DATE: November 30, 2010

On October 29th, Program staff attended a University of Nebraska at Kearney (UNK) thesis defense related to the Platte River Caddisfly (PRCF). During the presentation of research findings, it became apparent that there is still significant uncertainty associated with PRCF habitat requirements as related to the importance of woody vegetation and possible impacts associated with clearing of woody vegetation in areas with an extant PRCF population. After the presentation, Program staff mentioned that there is an extant PRCF population on the Program's McCormick Tract (Elm Creek Complex) in an area where tree clearing has been contemplated and a study of PRCF response to woody vegetation removal would provide valuable information to guide Program management actions and ensure that the PRRIP does not adversely impact one of our species of concern.

Dr. Wyatt Hoback indicated that UNK would be interested in participating in a research project to assess PRCF response to tree removal and an existing graduate student could be assigned to the project. Program staff asked Dr. Hoback to develop a brief research proposal to be brought before the Technical Advisory Committee in December of 2010. That proposal is attached to this memorandum.

The Program would be involved in the proposed research in the following ways:

- TAC review and approval of the full study design.
- EDO personnel would procure, oversee, and pay for clearing treatments. The 2011 Program budget includes \$15,000 in Line Item LP-2 for these treatments.
- The Program would contribute approximately \$24,000 to UNK during 2011-2012 to support this project. The 2011 contribution of approximately \$12,000 would come from the \$200,000 in Line Item IMRP-2 for to-be-identified research projects.

The Program would also receive regular updates by the project team and would be afforded the opportunity to review and comment on study findings prior to publication.

Background:

The Platte River caddisfly (PRCF), *Isonychia plattensis*, was first described from an intermittent, warm water slough on Mormon Island in south-central Nebraska in 1999. The type locality is near the Platte River in a wet meadow that is devoid of trees. When described, the PRCF attained average aquatic densities of 802 larvae per m² ± 194. Unlike most caddisfly species, the PRCF appears adapted to a season cycle of flooding and drying. It occupies off-channel sites and moves to land in late April or early May where it aestivates (maintains low metabolic activity) until pupation in September when adults oviposit following fall rains. Because the lifecycle includes a terrestrial aestivation phase, it was noted that the PRCF was likely an important component of energy transfer between the aquatic and terrestrial environments.

Between 1999 and 2004, 49 surveys were conducted to identify sites occupied by the PRCF and only five were identified, in addition to the type locality. Between 2009-2010, 104 additional sites with potential habitat were visited, and 21 new populations were identified. These sites include off-channel sloughs adjacent to the Platte River and range from open grasslands to sloughs bordered by heavy forest. Among these sites, only one site supported densities similar to those historically found at the type locality while most other sites support less than 10% of historic numbers.

Because it is endemic and known from few sites in Nebraska, the PRCF is listed as a Tier One, or at-risk, species. A shade study and laboratory investigations of behavior demonstrate the PRCF is prone to desiccation while it aestivates on land in the summer. Field observations further revealed that terrestrial larvae burrow underground during aestivation, possibly to avoid desiccation.

Changes to the Platte River including invasion by native and exotic vegetation have required extensive habitat management through mechanical and chemical removal of vegetation to improve habitat for migratory bird species such as sandhill and whooping cranes, and to improve reproductive habitat for species such as piping plover and least terns. Removal of vegetation has the potential to also impact PRCF. However, because there is a lack of historic data, the impacts of vegetation removal on this species are unknown.

Objective:

To determine PRCF response to terrestrial vegetation removal.

Project Outcomes:

The PRCF is adapted to historic conditions on the Platte River including seasonal moisture cycles. Historically, seasonal flooding and scouring by ice likely maintained open areas with few trees. However, at present, most occupied sites have abundant woody vegetation. This vegetation may represent a threat to the continued existence of the caddisfly or it may provide a refuge for desiccation and overheating. By conducting an experiment to monitor habitat change in association with vegetation removal, along with response by PRCF, best management practices can be developed to conserve and benefit remaining populations of PRCF.

Methods:

The experiment will be conducted on a slough that is currently occupied by a low density of PRCF on the McCormick tract located 150- 200 meters south of the main channel of the Platte River.

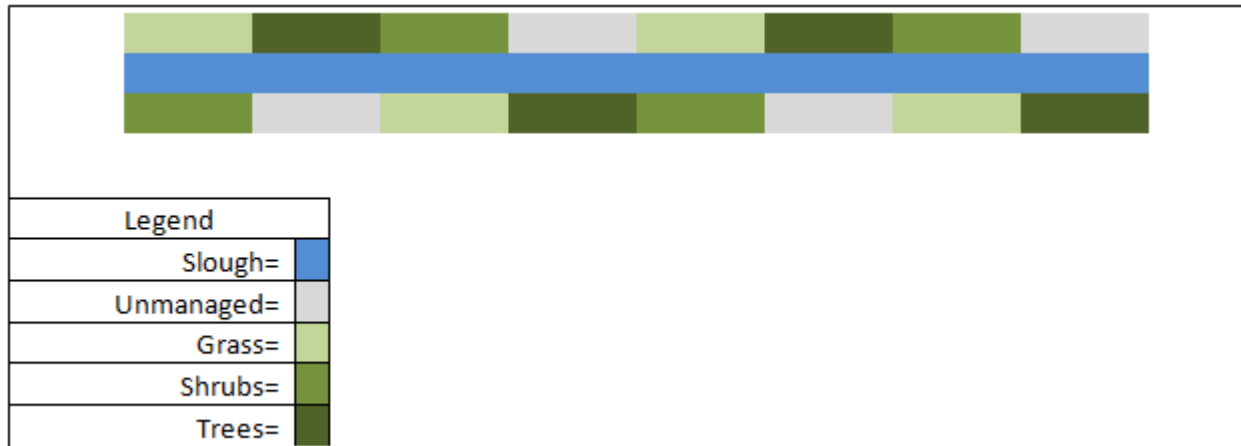


Figure 1

The habitat is approximately 0.5 miles in length. In consultation with the Platte River Recovery Implementation Program, eight 50 meter plots on both sides of the slough will be manipulated and measurements will be taken for a period of 18 months. After habitat clearing, the PRCF will have four choices for a site to aestivate. “Trees” will have the understory removed, “grass” will have all woody vegetation removed, and “shrubs” will have trees removed but understory will remain.

Observations will begin in early-May and end in early-August in 2011 and 2012. The following data will be recorded. Larval densities in the slough will be determined using aquatic d-frame sampling at the midpoint of each treatment in the slough. During the terrestrial phase of the life cycle, caddisfly densities will be counted biweekly at each plot utilizing survey protocols above and below the soil surface. Four above ground and below ground surveys per plot will be conducted with a 0.25 m² quadrat.

Abiotic measures will include:

- Soil moisture, soil temperature, and relative humidity readings (per plot)
- Plant species composition and cover (one transect per plot)
- Leaf litter depth and percent bare ground
- Light intensity readings

Anticipated Two-Year Budget

Personnel

UNK Graduate student	\$15,000
FICA (6.5%)	\$975
UNK tuition waiver (1 semester)	\$3,000

Materials and Supplies \$1,200

Travel \$1,500

Subtotal \$21,675

UNK indirects (modified 10% of total) \$2,168

TOTAL: \$23,843