



PLATTE RIVER RECOVERY IMPLEMENTATION PROGRAM Protocol for Aerial Photography in the Central Platte River Valley

I. PURPOSE

The purpose of this protocol is to describe the conceptual design, methods, and procedures that will be used to document vegetative and geomorphologic conditions of the central Platte River Valley in Nebraska using aerial photography. The photography as outlined in this protocol is sufficient to fulfill data needs for implementation of the Program's Adaptive Management Plan; however, this does not preclude the possible need for additional remote sensing in the future (e.g., LIDAR, videography, etc). Currently, the Program has available a complete land use/land cover GIS analysis of 1998 CIR photography and a land use/land cover GIS analysis of 2005 CIR photography. In addition, LiDAR collection at 0.7m resolution is taking place in spring 2009. Long-term, consistent collection of landscape data for the study area through aerial photographs will enable future habitat use/availability research. This protocol describes the procedures to be used as follows:

1. Digital CIR orthophotographs for comparison of conditions at the end of the First Increment with the existing conditions photography of 1998.
2. Digital CIR orthophotographs taken annually during full vegetative cover in late May-June.
 - a. Photos will be used for evaluating vegetation and channel conditions during least tern and piping plover nesting seasons.
 - b. Photos will be used for sampling land use/land cover classes and documenting vegetation characteristics on Program lands and within managed areas.
 - c. Photos will be used to document the physical and/or biological characteristics of use sites and these habitat parameters will be described and measured for the purpose of comparative habitat analyses (e.g., as in comparing used sites from available sites selected randomly on photographs).
 - d. Photos will be used to monitor morphological characteristics such as island position and stability, bank position, channel width, and track changes associated with management techniques.

II. DESIGN CONSIDERATIONS AND SPECIFICATIONS

II.A. Area of Interest

The area of interest for aerial photography consists of an area 3.5 miles either side of the centerline of the Platte River and tributary basins beginning at the junction of U.S. Highway 283 and Interstate 80 near Lexington, Nebraska, and extending eastward to Chapman, Nebraska (approximately 95 miles). Certain areas within this stretch of the central Platte will be prioritized for monitoring based on key priority hypotheses, ecological need, and Program actions undertaken during the First Increment.



II.B. Project Design

II.B.1. End of First Increment CIR Orthophotography

CIR orthophotography will be conducted to replicate the 1998 CIR orthophotography at the end of the First Increment. This photography will be obtained in time to finalize geospatial analyses by the end of the First Increment for use in the analysis of all data for the establishment of milestones for the Second Increment. It is difficult to predict all the data needs at this point, but at a minimum pre-Program land cover, land use, and species use layers will be repeated. Conditions of photography should closely match the 1998 existing condition photography (i.e., late summer with flows at or below 1,000 cfs).

II.B.2 Annual CIR Photography

Annual CIR orthophotography will be used to document habitat conditions for least terns and piping plovers. In addition, it can be used to document summertime vegetation characteristics throughout the system, on Program lands, and within managed areas. For example, bare sand substrates will be identified that may be potential least tern and piping plover nesting habitat, and major management changes can be tracked, such as tree clearings or cropland changes. Changes in available nesting habitat will be tracked throughout the First Increment. Information gained from aerial photography will also be used in conjunction with measurements taken at specific sites on the ground that relate to vegetation establishment on the bars, height of bars, etc. CIR photos will be used to estimate the land use/land cover types present (e.g., amount of grassland, forest, etc). This CIR photography will also be used for channel morphology measurements. The photos will be used to help measure parameters such as channel width, bank position, island position and stability, hydraulic geometry characteristics of width, and track changes associated with management techniques. Use and analysis of the aerial photography will be described in protocols that are written for the specific activities outlined in the Program's Integrated Monitoring and Research Plan (IMRP). Photos will be taken on an annual basis between late-May and June with flows at or near 1,200 cfs (i.e., target flow levels during this time of year).

II.C. Timing

The end of First Increment CIR orthophotography should be taken two years before the end of the First Increment in late summer (e.g., August) when flows are at or below 1,000 cfs. Annual CIR orthophotography will be obtained between late-May and June. Photography should be obtained at flows as close to 1,200 cfs as possible.

III. METHODS

III.A. Field Techniques

CIR orthophotography will be used to document and monitor habitat conditions along the central Platte River. The Program may choose to implement each protocol component as necessary to obtain needed information, for example changing the number of aerial surveys based on results of past surveys. Exact survey dates will be adjusted as more data is collected. The flight schedule will be dependent on suitable conditions for operating a small plane (weather and mechanical), snow cover, and other environmental conditions.



III.A.1 End of First Increment CIR Orthophotography

CIR orthophotography planned for the end of the First Increment will use methods comparable to the CIR photography conducted for GIS analysis in 1998 (U.S. Department of the Interior 2000).

III.A.2. Annual CIR Orthophotography

CIR photos will be taken at a 2-foot digital resolution (approximately equal to a scale of 1:4800) and will include the entire 90-mile length defined in the Program, at a distance of 3.5 miles from the centerline of the main channel or 2 miles from a side channel.

III.B. Analysis Methods

This protocol describes the collection of aerial photographs and is not meant to detail how the photographs will be used or analyzed. The use and analysis of aerial photography information is described in the individual species and habitat research/monitoring protocols developed in the IMRP.

IV. QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)

QA/QC measures will be implemented at all stages of the study, including field data collection, data entry, and report preparation.

V. DATA COMPILATION AND STORAGE

Data will be collected and stored by Program staff, and will be made available through the Program Database Management System. Depending on size and bandwidth concerns, imagery may or may not be available for download through the Program website.

VI. REPORT FORMAT

The contractor will provide appropriate FGDC metadata including, but not limited to: information on the dates and times of flights, camera and aircraft information, horizontal accuracy, imagery resolution, spatial reference information, and post-processing modifications. Program Staff will append river flow conditions from the flight dates to the metadata.

VII. ADMINISTRATION

Program staff will be responsible for the implementation of this protocol, including securing contractors to perform flights and working with those contractors to schedule flights.

VIII. DATA SHEETS

No Program data sheets will be utilized in implementation of this protocol. Qualified contractors will supply all aircraft, personnel, and other necessary equipment.

IX. BIBLIOGRAPHY

U.S. Department of the Interior. 2000. Central Platte River 1998 Land Cover/Use Mapping Project, Nebraska. Technical Report of the Platte River EIS Team.



X. ESTIMATED BUDGET

Cost estimates to capture the different photographs are presented below and are based on quotes received in 2008. Inflation and other factors may increase these costs during the Program. Costs associated with analyzing the different types of photographs will be included in the protocols that use these photos (e.g., Geomorphology/In-Channel Vegetation Monitoring). Costs of interpreting the CIR orthophotography near the end of the First Increment are also not included in this protocol.

Annual CIR orthophotos will be taken at a 2-foot digital resolution (approximately a scale of 1:4800). Photography will include the entire 90-mile length defined in the proposed Program and include 3.5 miles either side of the centerline of the main channel, and within 2 miles of a side channel. Acquisition and image processing is expected to cost between \$30,000 and \$40,000. End of First Increment CIR orthophotography should be taken two years before the end of the First Increment of the Program. Cost is expected to be between \$30,000 and \$40,000.