

# Memo

Date: Wednesday, October 21, 2020

Project: Chapman Islands

To: PRRIP

From: HDR Engineering, Inc.

Subject: Ordinary High Water Mark Delineation

## INTRODUCTION

The Platte River Recovery Implementation Program (PRRIP) intends to remove trees and other woody vegetation on several islands identified as the Chapman Islands within the Platte River near Phillips, Nebraska (see attached Figure 1). Woody vegetation removal is proposed to restore favorable whooping crane habitat along this reach of the Platte River. The purpose of this memorandum is to document the ordinary high water mark (OHWM) of the Platte River at Chapman Islands.

## BACKGROUND

The Platte River near Phillips, Nebraska is considered a braided channel gradually transitioning to an anastomosing / anabranching channel due to flow regulation and encroachment of riparian vegetation. Anabranching channels are distinguished from braided channels due to the presence of multiple subparallel channels separated by vegetated or otherwise stable islands (USACE 2016). The stable islands within an anabranching channel typically persist for decades or longer and are similar in elevation to the adjacent floodplain. Discerning the OHWM within anabranching channels can be difficult due to the presence of multiple channels that can frequently shift in size and location.

There are three categories of indicators used to delineate the OHWM: hydrologic, geomorphic, and vegetative (USACE 2016). Geomorphic and vegetative indicators using physical or botanical features along the stream are often the most readily utilized and applied in the field. The following describes these indicators:

- Geomorphic indicators are exhibited as physical features along a channel that are the result of erosion and deposition during ordinary high water (USACE 2016). Physical features attributable to the ordinary high water include instream bedforms, evidence of bedload transport, and evidence of erosion.
- Vegetative indicators include the types and ages of present plant species along the channel. The presence or absence of vegetation and particular vegetative communities can aid in discerning the location of the OHWM. Woody shrubs and trees are helpful in estimating the frequency and duration of flow at certain elevations (USACE 2016). Woody vegetation, particularly mature woody vegetation, is not typically identified below the OHWM.

Table 1 outlines geomorphic and vegetative indicators of the OHWM commonly identified in the field. The described geomorphic and vegetative indicators were utilized by HDR environmental scientists to determine the OHWM at Chapman Islands.

**Table 1. Geomorphic and Vegetative Indicators of the OHWM Categorized by Location<sup>1</sup>**

|                              | Below OHWM   | At OHWM  | Above OHWM   |
|------------------------------|--|--|--|
| <b>Geomorphic Indicators</b> | <ul style="list-style-type: none"> <li>-Instream bedforms (ripples, dunes, etc.)</li> <li>-Evidence of bedload transport</li> <li>-Evidence of river erosion within the channel (scour holes)</li> <li>-Mudcracks</li> <li>-Narrow berms and levees</li> <li>-Knickpoints</li> </ul> | <ul style="list-style-type: none"> <li>-Grain size change (silt deposits)</li> <li>-River deposits (staining of rocks, organic litter)</li> <li>-River erosion (exposed roots below intact soil layer)</li> <li>-Channel morphology</li> </ul> | <ul style="list-style-type: none"> <li>-Soil development</li> <li>-Surface topography (relief, rounding, depositional topography, secondary drainage development)</li> </ul>   |
| <b>Vegetative Indicators</b> | <ul style="list-style-type: none"> <li>-Sparse vegetation</li> <li>-Annual herbs</li> <li>-Herbaceous marsh species</li> </ul>   | <ul style="list-style-type: none"> <li>-Annual herbs and early-successional species</li> <li>-Few perennial herbs</li> <li>-Pioneer tree seedlings and saplings</li> </ul>   | <ul style="list-style-type: none"> <li>-Perennial and annual herbs</li> <li>-Mature pioneer trees (less percentage of young trees)</li> <li>-Mature pioneer trees with some upland vegetation</li> <li>-Late-successional species</li> </ul> |

Note: 1. Table and indicators adapted from tables presented in USACE's *Synthesizing the Scientific Foundation for Ordinary High Water Mark Delineation in Fluvial Systems* (December 2016).

## **METHODOLOGY**

On September 22, 2020, HDR Engineering, Inc. (HDR) environmental scientists conducted a site visit at Chapman Islands to delineate the OHHM on a select number of areas. USACE defines the term “ordinary high water mark” as the line on the shore or bank established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris..” (33 CFR 329.11(a)(1); USACE 2005). The horizontal extent of the observed OHHM was delineated using indicators presented in Table 1 and were mapped to the greatest extent possible using GPS instrumentation. Representative photographs were taken to document conditions during the site visit and are provided in the attached photo page.

## **DISCUSSION**

Utilizing the indicators described in Table 1, HDR determined the OHHM at Chapman Islands. Figure 2 shows the approximate horizontal boundary of the OHHM. This boundary indicates that the islands are predominantly at an elevation higher than the OHHM. Representative site photographs documenting representative conditions are attached. No woody vegetation was observed growing below the OHHM along the banks of the islands. This is consistent with USACE’s definition of an active channel: “...portions of a channel without mature woody vegetation” (USACE 2016).

Woody vegetation on Chapman Islands consisted of eastern cottonwoods, green ash, honey-locust, Russian olive, eastern red cedar, and various willow species. This is a similar riparian composition as compared to what is found along the banks of the river. Select areas displayed exposed tree roots below the OHHM. Removal of these trees would not be considered an impact below the OHHM so long as the root ball of the tree remains intact.

The braided channels flowing around the islands are all considered active, with none of them displaying secondary channel or abandoned channel characteristics.

While no woody vegetation was observed below the OHHM of the Platte River, it is possible that there are depressional wetland areas within the interior of the islands that are below the OHHM. A wetland delineation was not performed as part of the site visit. Section 404 Clean Water Act

permitting should be considered as it relates to vegetation removal methods and actions. Due to the dynamic nature of the Platte River, the OHWM findings outlined in this memo, particularly the horizontal boundary, are subject to change based on future flooding events and the continued erosion and depositional processes of the Platte River system.

## REFERENCES

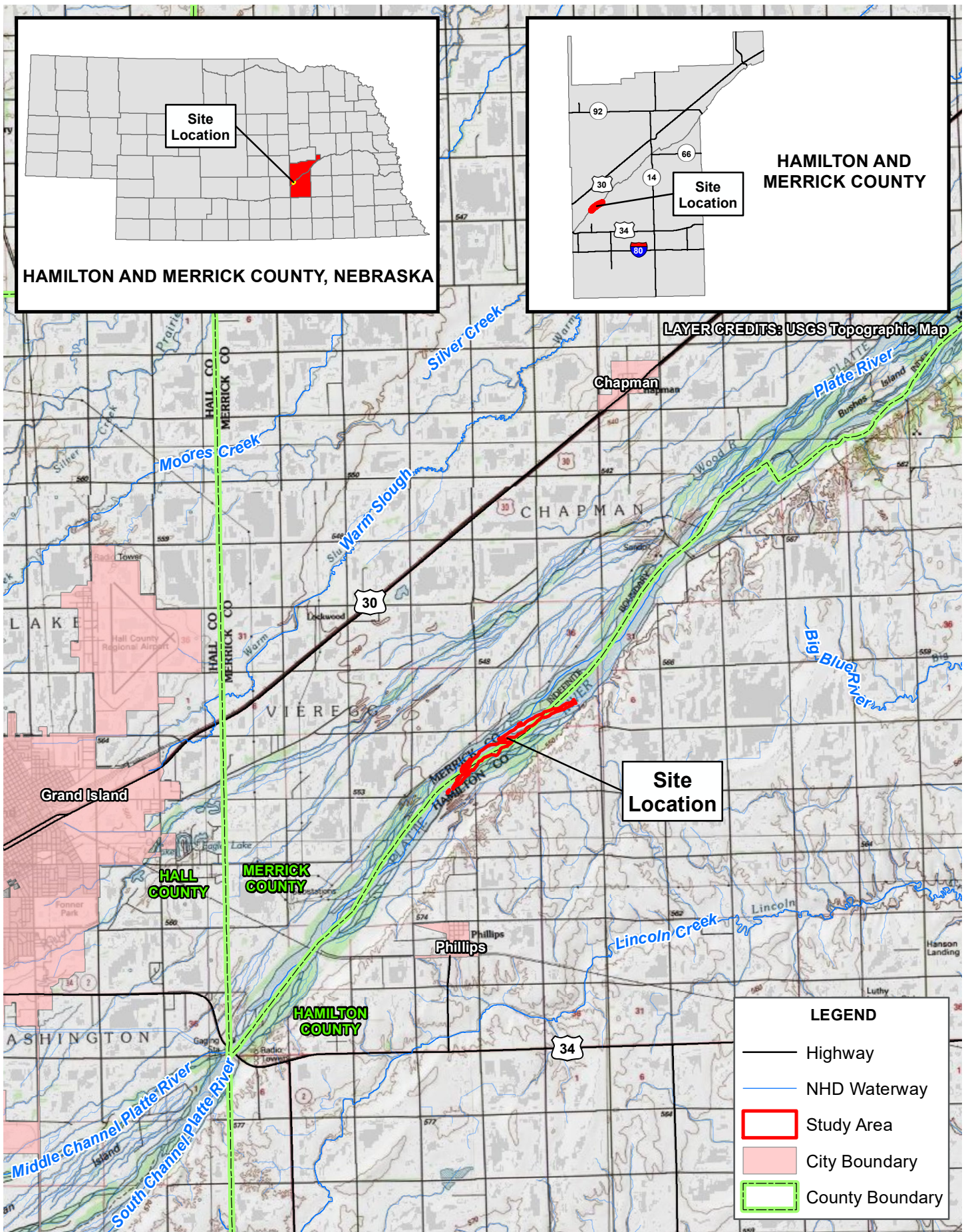
- US Army Corps of Engineers. 2005. "Ordinary High Water Mark Identification." Regulatory Guidance Letter December 7. <https://www.nap.usace.army.mil/Portals/39/docs/regulatory/rqls/rql05-05.pdf>.
- US Army Corps of Engineers. 2016. "Synthesizing the Scientific Foundation for Ordinary High Water Mark Delineation in Fluvial Systems." Wetlands Regulatory Assistance Program (WRAP). December. <http://hdl.handle.net/11681/20650>

# Figures

**Figure 1 – Project Location**

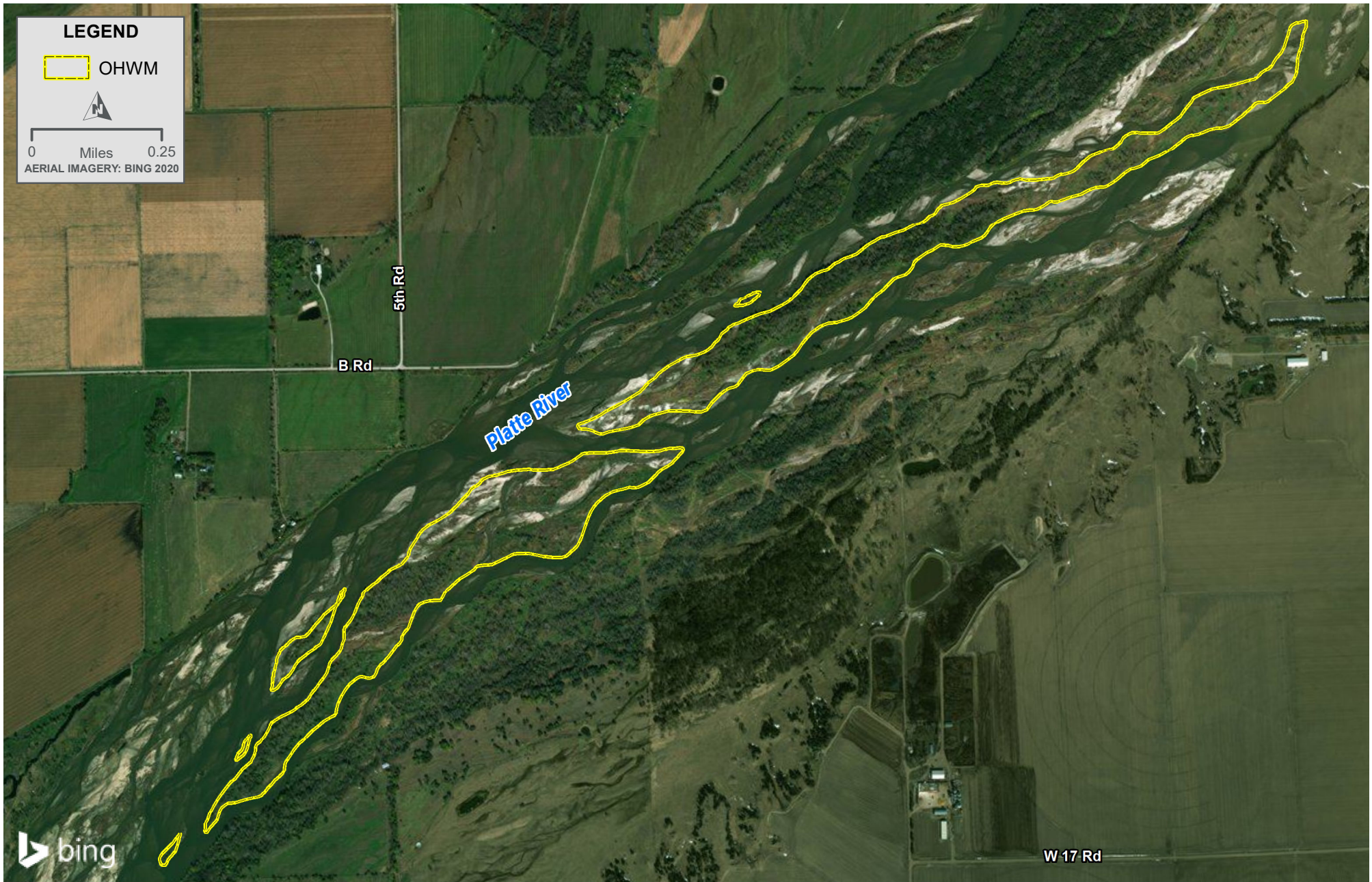
**Figure 2 - OHWM**





**PROJECT LOCATION**  
**CHAPMAN ISLAND OHW DELINEATION**  
**PRRIP**  
**FIGURE 1**





OHWM  
CHAPMAN ISLAND OHWM DELINEATION  
PRIP  
FIGURE 2

# Photographs





**Photo 1.** View of riparian vegetation growing above the OHWM at Chapman Islands. Orientation south.



**Photo 2.** View of riparian vegetation growing above the OHWM at Chapman Islands. Orientation north.





**Photo 3.** View of OHWM along the bank of one of the Chapman Islands. Orientation southeast.



**Photo 4.** View of OHWM along the bank of one of the Chapman Islands. Orientation northeast.





**Photo 5.** View of OHWM along the bank of one of the Chapman Islands. Orientation southwest.



**Photo 6.** View of OHWM along the bank of one of the Chapman Islands. Orientation northeast.





**Photo 7.** View of OHWM along the bank of one of the Chapman Islands. Orientation southwest.



**Photo 8.** View of area above the OHWM at one of the Chapman Islands. Area displays mature woody vegetation and upland vegetation. Orientation southeast.