

# **Blacklock Restoration Project in Suisun Marsh 5 Years of Post-Breach Monitoring**

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Suisun Marsh Program**



A satellite map showing a large river system with several reservoirs. A blue diamond marker is placed on a tributary river, with a black arrow pointing to it from the right. The text 'Blacklock Restoration Project' is written in bold black font next to the arrow. The map shows a mix of green vegetation, brownish-tan dry land, and grey urban areas. A scale bar and 'Google earth' logo are visible at the bottom.

**Blacklock  
Restoration  
Project**

4.53 mi

Google earth



**Blacklock  
Restoration  
Project**

**To  
Sacramento/  
San Joaquin  
River Delta**

**To San Francisco Bay**

4.53 mi

Google earth



# Interim Water Management – Long Hydroperiod

April 20, 2004



May 10, 2005





**Brush Box  
Installed**

**Tules Planted**



**April 2006**

**August 2007**

**Intentional Breach  
October 3 and 4 2006**



**Unintentional Breach July  
2006**



# 10 Year Monitoring Plan

**Inundation Regime**

**Methyl Mercury**

**Levee Breach Geometry**

**Water Quality:  
Temperature, EC, DO**

**SET Measurements**

**Vegetation**

**Topographic Surveys**

**Invasive Plant Control**

**Erosion of Adjacent  
Sloughs**

**Avian Surveys**

**Channel Network  
Evolution**

**Salt Marsh Harvest Mouse**

# **Elevation Change Monitoring**

**What Did Not Work Well:  
Surface Elevation Tables**

**What Did Work Well:  
Bathymetric Surveys  
Topographic Transect Surveys**



**1.**



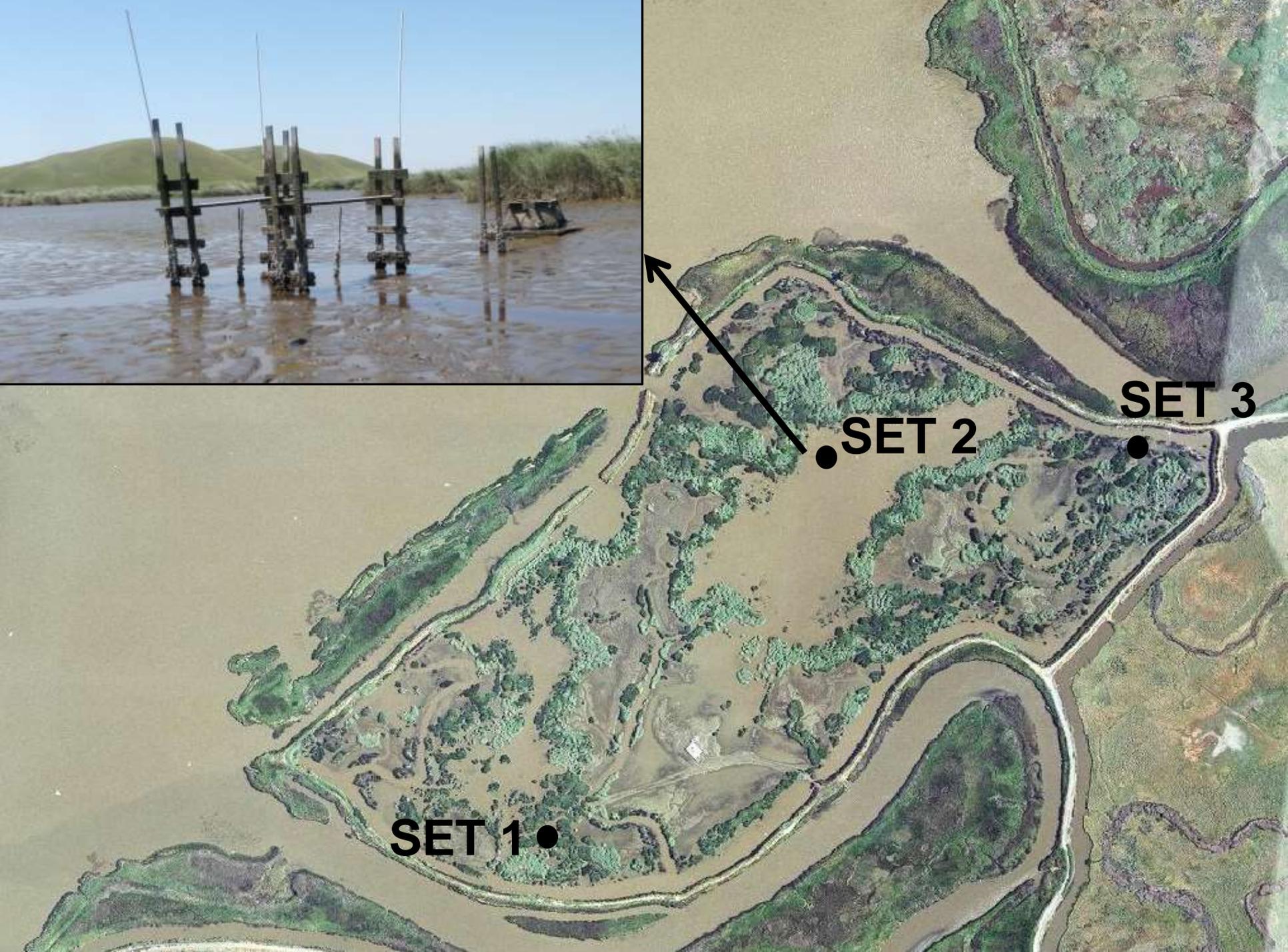
**2.**



**3. Measure Distance**

**Surface Elevation  
Tables**



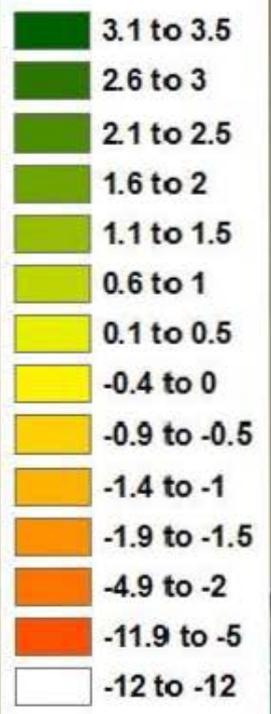


**SET 1** ●

**SET 2** ●

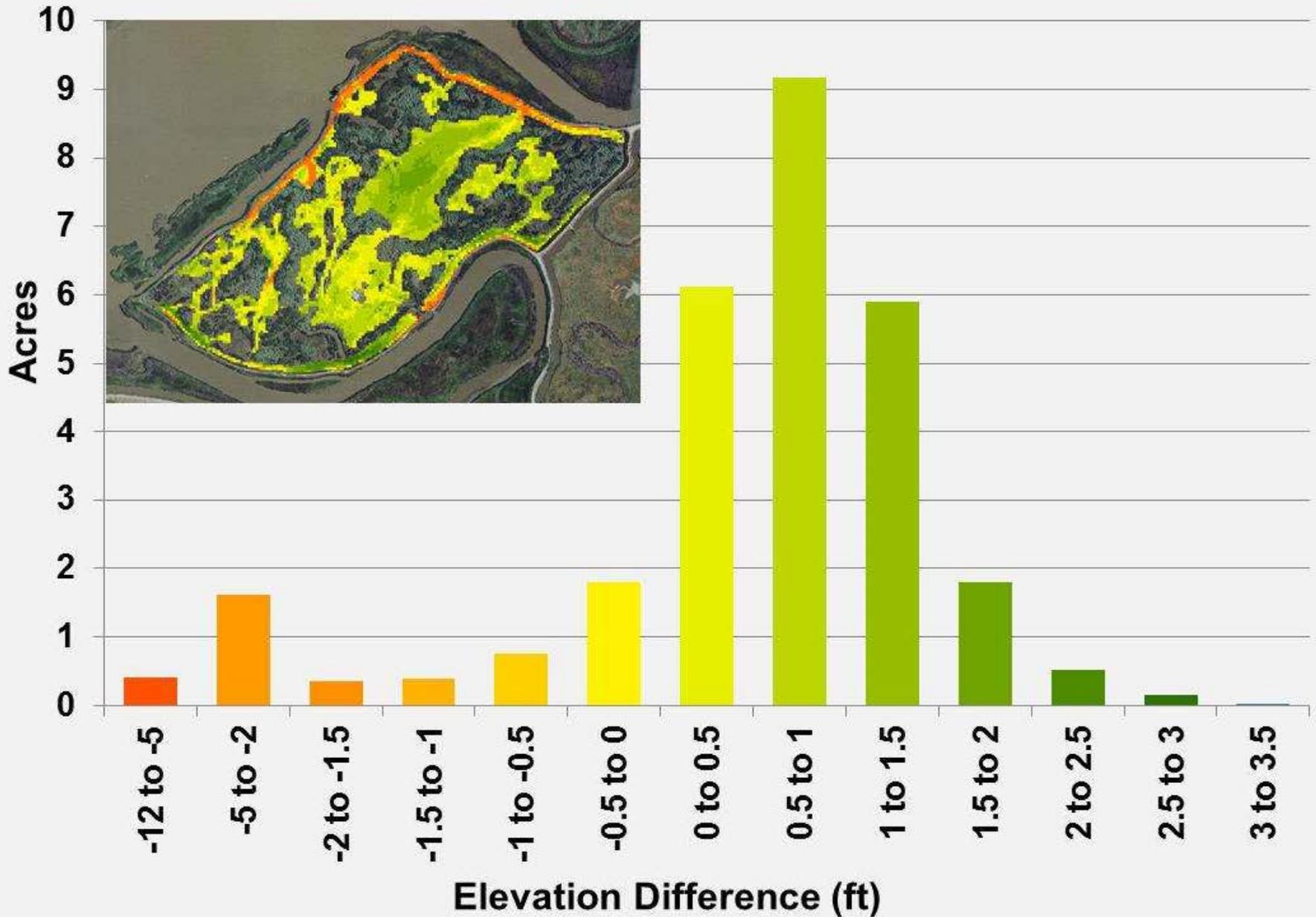
**SET 3** ●

**Elevation  
Change (ft)  
2003 - 2013\***

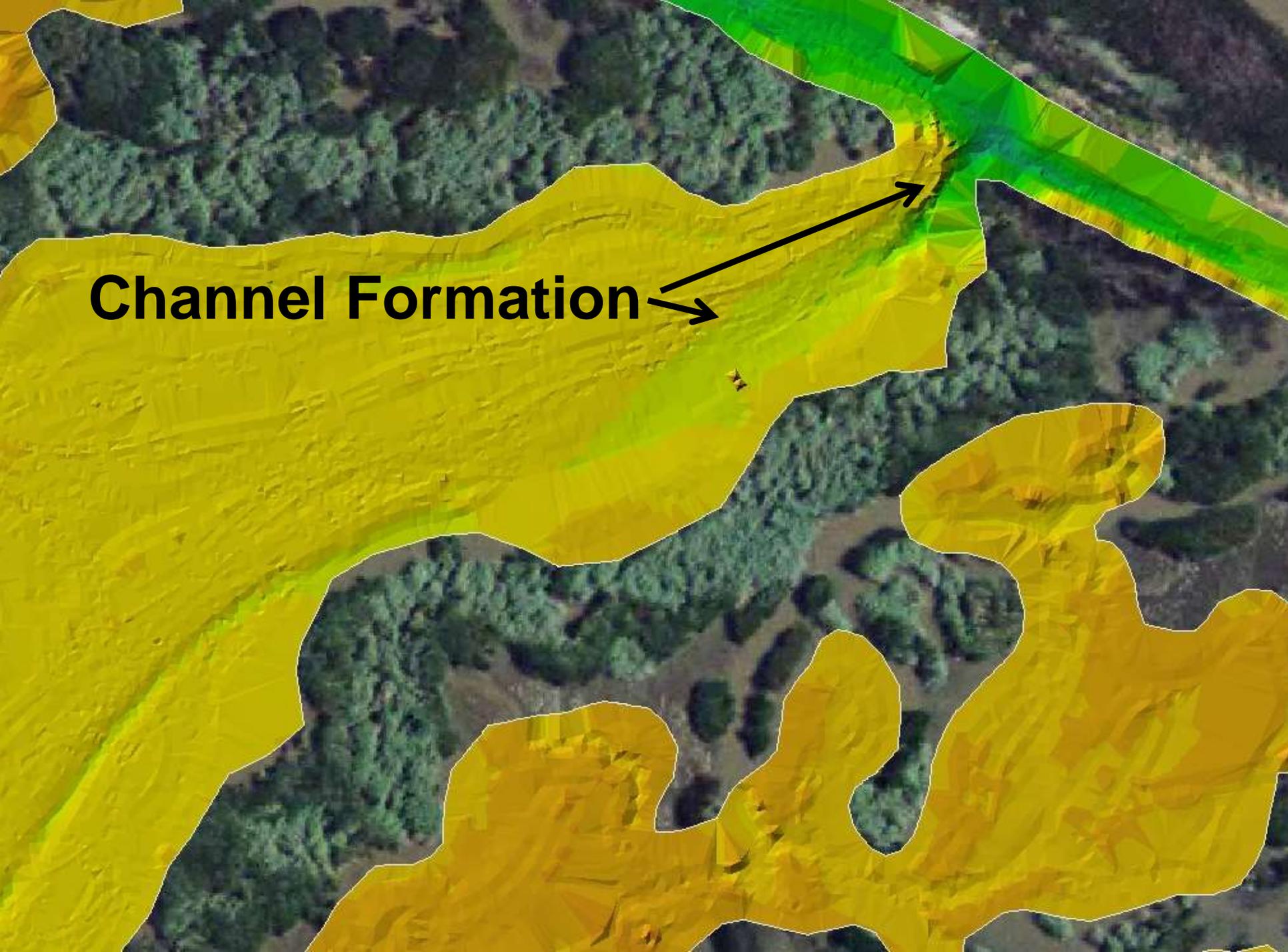


**\*Data collection methods in 2003 were not as accurate as in 2013, resulting in less accurate elevation change results.**

# Blacklock Elevation Change 2003-2013



**Channel Formation**



**5/2014**

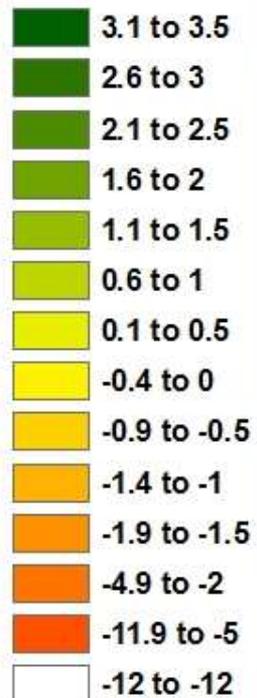
**Channel Formation**



**2003**

**Vegetation -  
50 Foot Width**

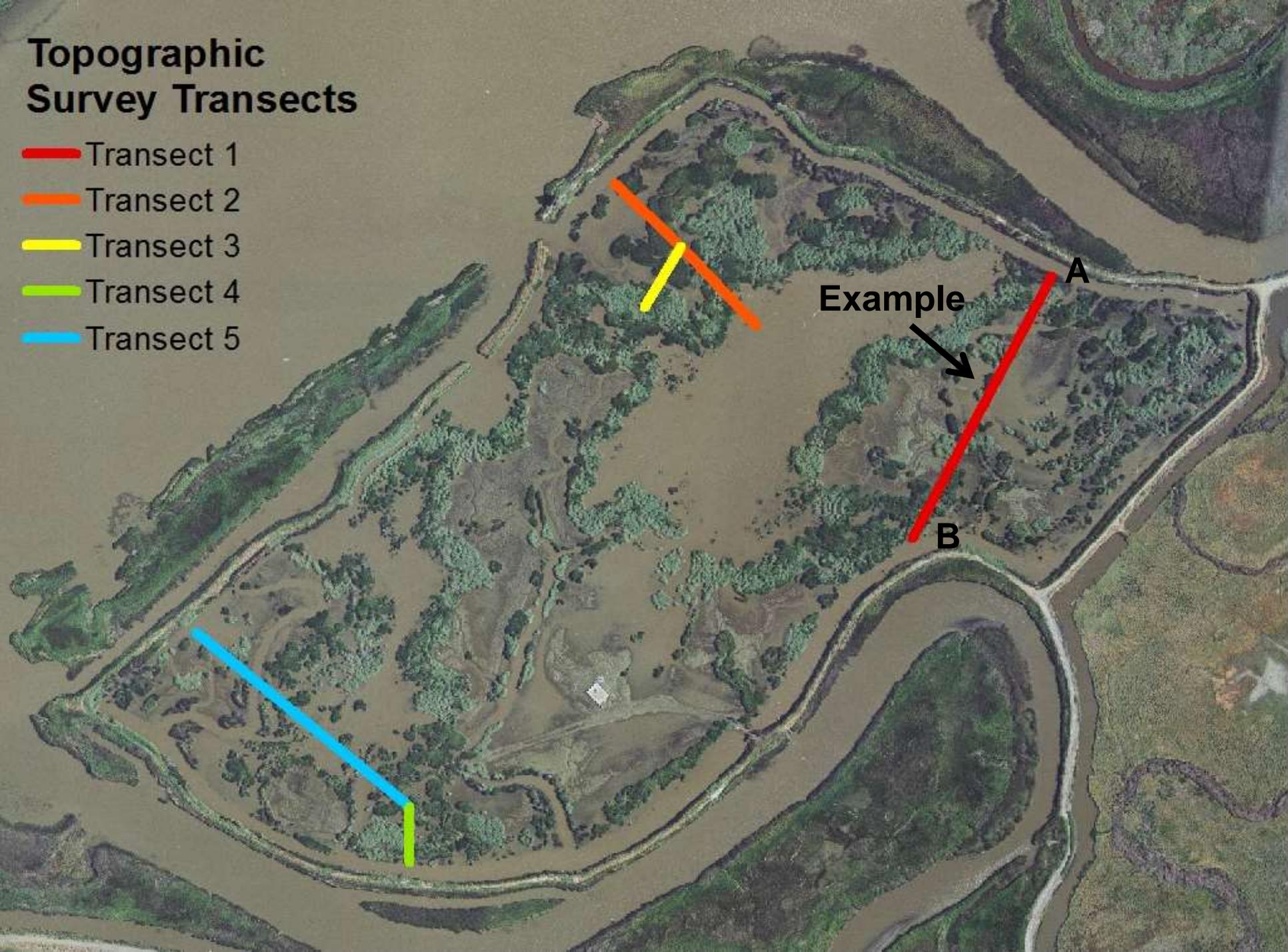
**Elevation  
Change (ft)  
2003 - 2013\***



\*Data collection methods in 2003 were not as accurate as in 2013, resulting in less accurate elevation change results.

# Topographic Survey Transects

- Transect 1
- Transect 2
- Transect 3
- Transect 4
- Transect 5



Example

A

B





# Blacklock Restoration Project 2009

-  Vegetated
-  Unvegetated

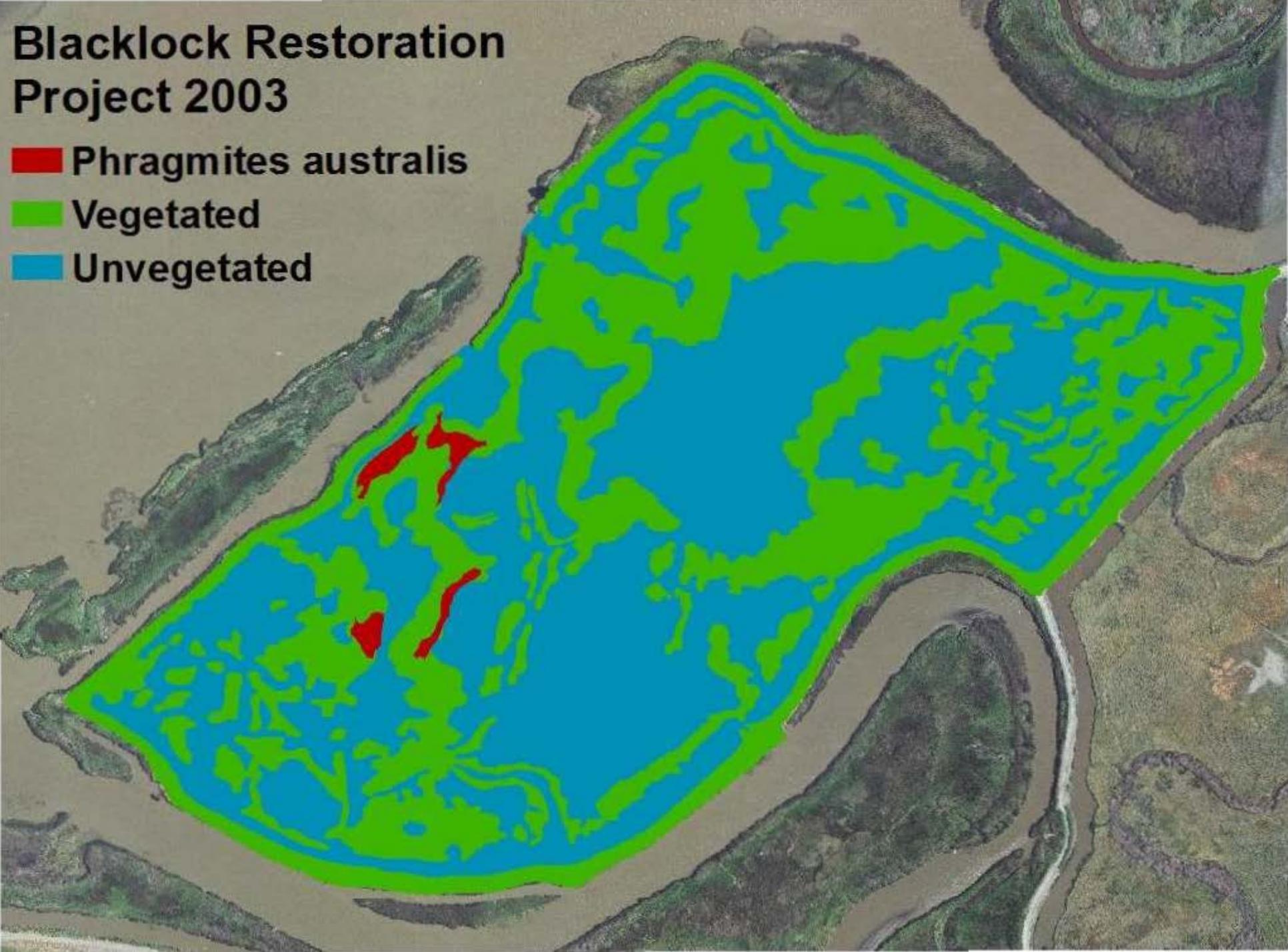


# Blacklock Restoration Project 2003

 *Phragmites australis*

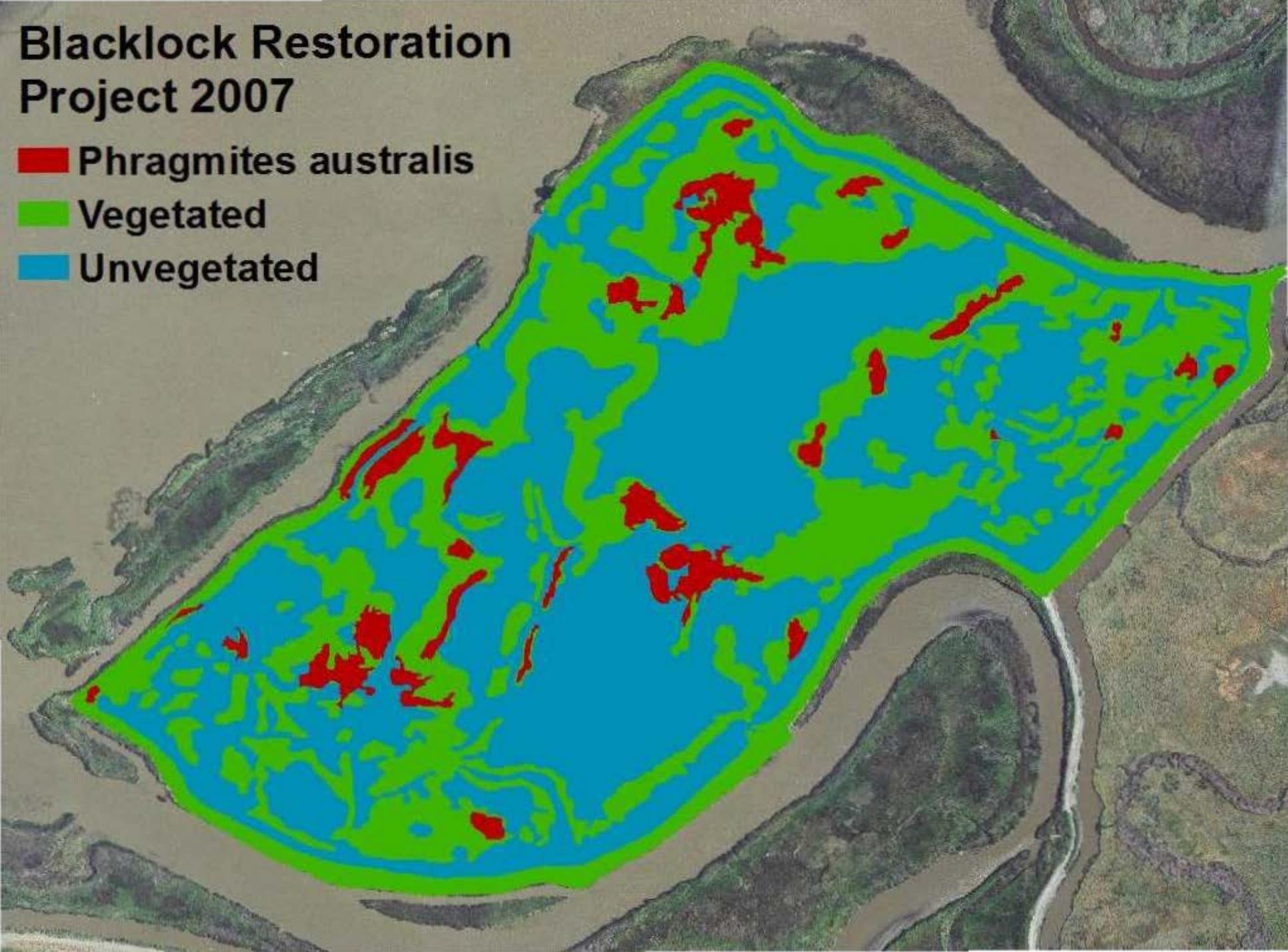
 Vegetated

 Unvegetated



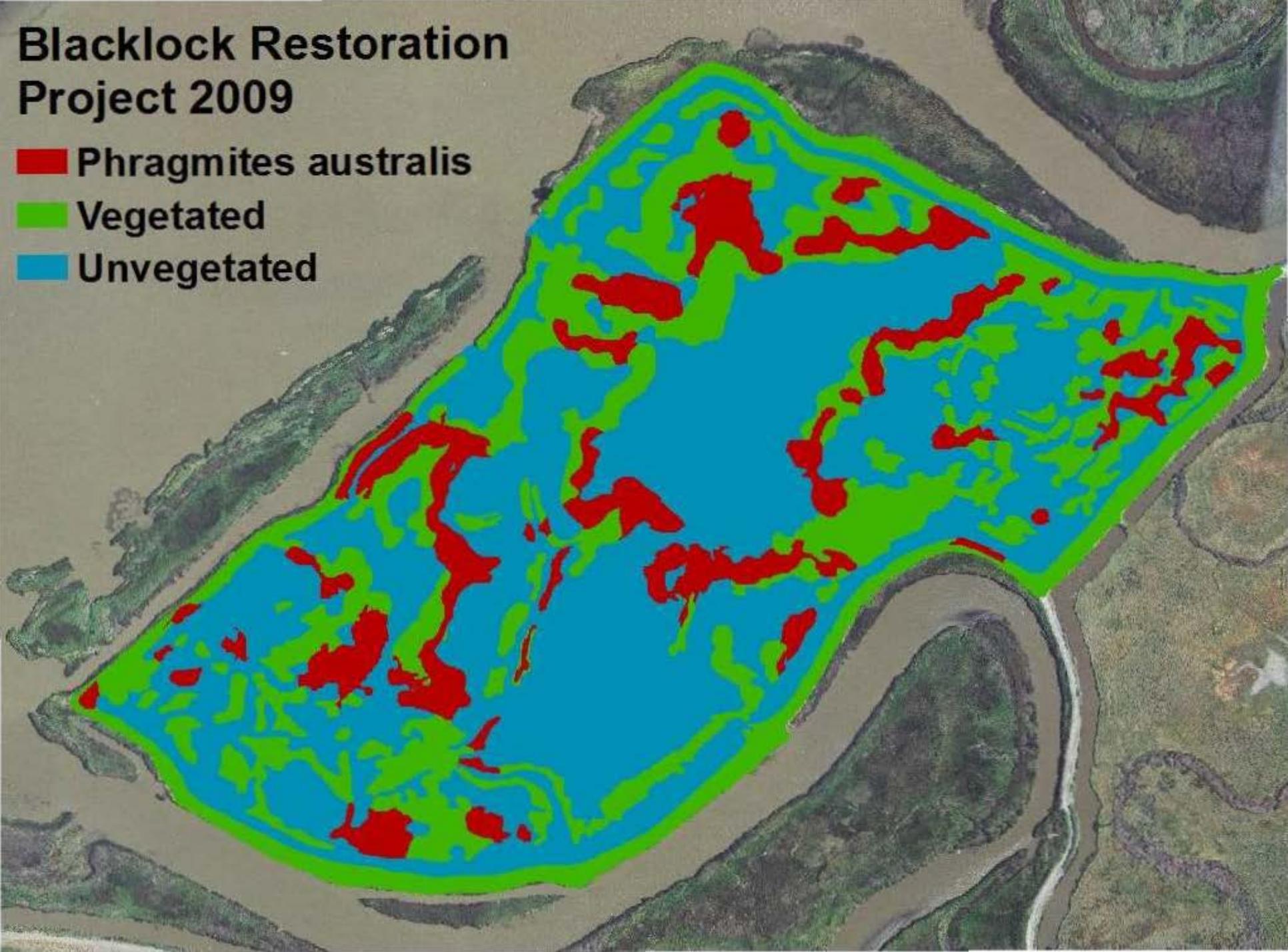
# Blacklock Restoration Project 2007

- *Phragmites australis*
- Vegetated
- Unvegetated



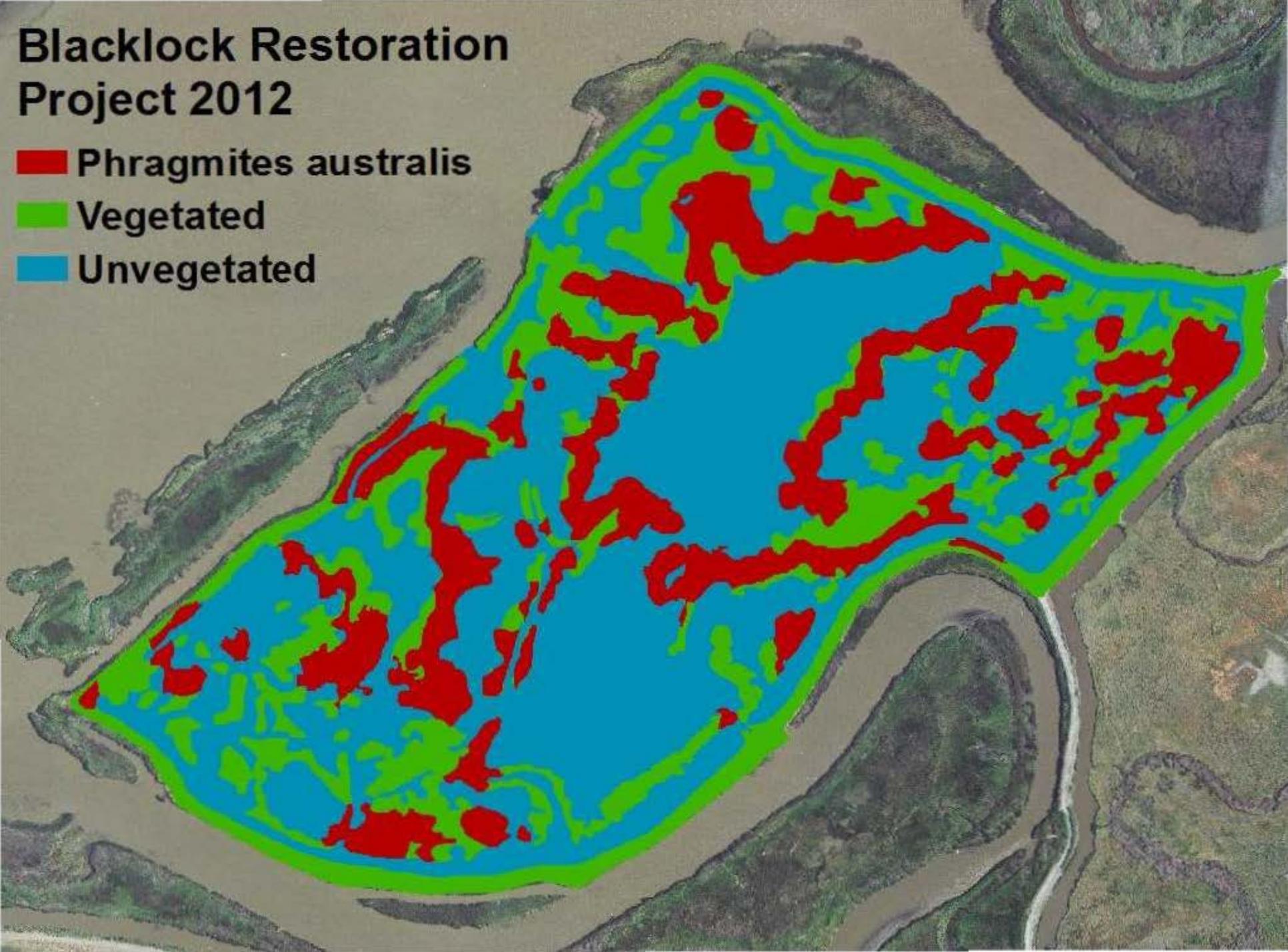
# Blacklock Restoration Project 2009

- *Phragmites australis*
- Vegetated
- Unvegetated



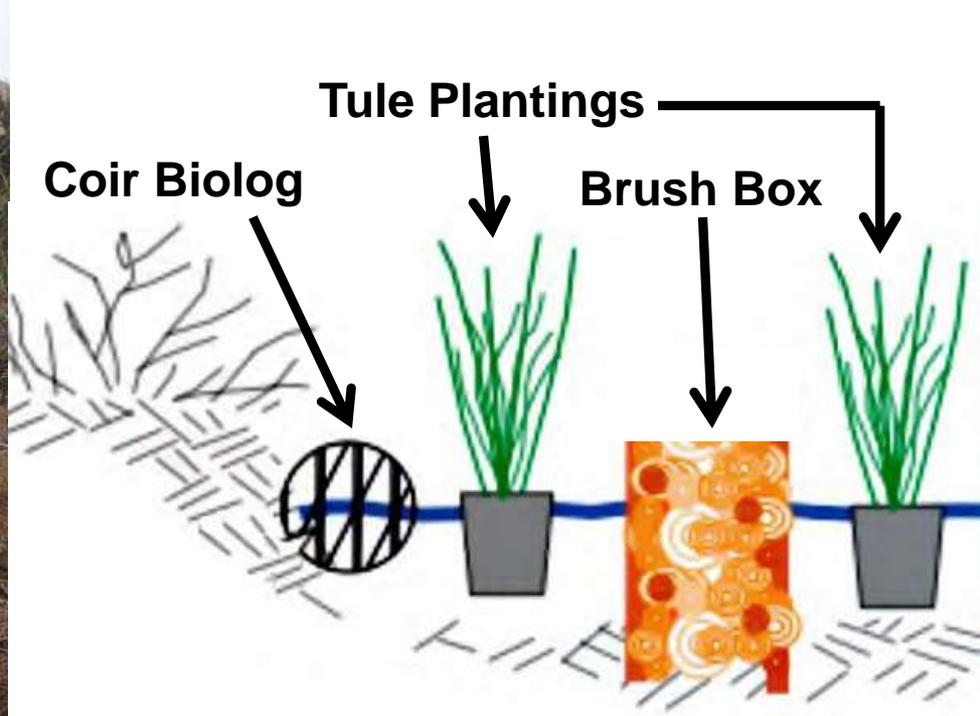
# Blacklock Restoration Project 2012

- *Phragmites australis*
- Vegetated
- Unvegetated



# Remove Infrastructure Prior to Breaching





**2006**



**2009**



**2007**



**2010**



**Vertical Mowing**

# **Other Monitoring Results**

## **Water Quality:**

**There were similar concentrations of dissolved oxygen within the restored area and the adjacent slough.**

## **Avian Surveys:**

**There is a diverse range of avian species using the site.**

## **Fish Surveys:**

**Data collection recently started through separate project.**

# **Other Monitoring Results**

## **Channel Network Evolution:**

**Total channel length within the site increased by 26%.**

## **Methyl Mercury:**

**Concentrations in water, sediment, and fish tissue were, overall, higher immediately post-breach and decreased to lower concentrations within 2 years.**

## **Suisun Marsh Program Website:**

**<http://www.water.ca.gov/suisun/>**

# Thank You!

**Analysis, slides, pictures for this presentation:**

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**DWR, North Central Region Office**

**DFW, Region 3 Suisun Marsh Monitoring and Compliance Unit**

**DFW, Vegetation Classification and Mapping Program**

**DFW, Moss Landing Marine Laboratory**

**Point Reyes Bird Observatory**