



# Jansen Habitat Compensation Trial Program

Holly Heffner, Advisor Environment, BHP

Susan Skinner, Assistant Project Manager, ERM

17 October 2018



Source: ERM

# Presentation outline

- **Jansen Project Background and EIS Commitment**
- **The Habitat Compensation Program**
- **The Trial Habitat Compensation Program**
  - Objectives
  - Design
  - Execution
  - Monitoring
  - Program Learnings
- **Q&A**



Source: Jansen toad translocation program

# The Jansen Project

**EIS approved in 2011 with 14 commitments, including:**

“BHP Billiton will develop a comprehensive habitat compensation plan to ensure no net loss of wetlands and associated habitat. The plan will be developed in cooperation with applicable government agencies and organizations.”



Source: BHP Jansen Image Library



# Jansen Habitat Compensation Program

## Program Objectives

- No net loss of wetland habitat and function.
  - Compensating at a 2:1 ratio (restored area: wetland lost/degraded)
- Restoration and enhancement of habitat for identified species.
- Utilize adaptive management practices to guide development of restoration/enhancement.

## Wetland Area disturbed

- To Date: 5.7 ha
- Overall Project: 54.8 ha
- Compensation Area: 109.6 ha

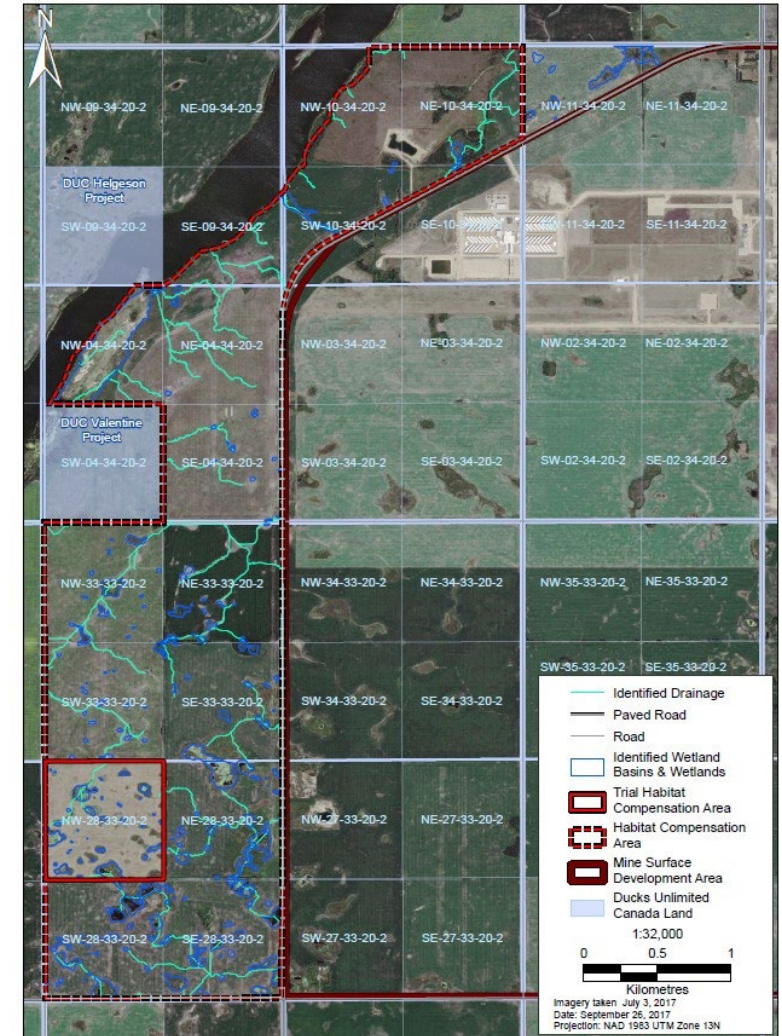


Source: Diane Taylor Photography

# Site Selection Criteria

## Criteria Included:

- Within the same ecoregion as the Jansen mine.
- Near an existing natural wildlife corridor (Jansen Lake).
- Has a suitable number of disturbed wetland basins for restoration and yet is not overly modified by current agricultural practices.



Source: Jansen Habitat Compensation Plan

# Trial Habitat Compensation Program (THCA)

## Goals

- To study and understand the methodology to use for the overall habitat compensation program.
- To compensate for the current wetland disturbance/loss.



Planning



Baseline



Execution



Monitoring

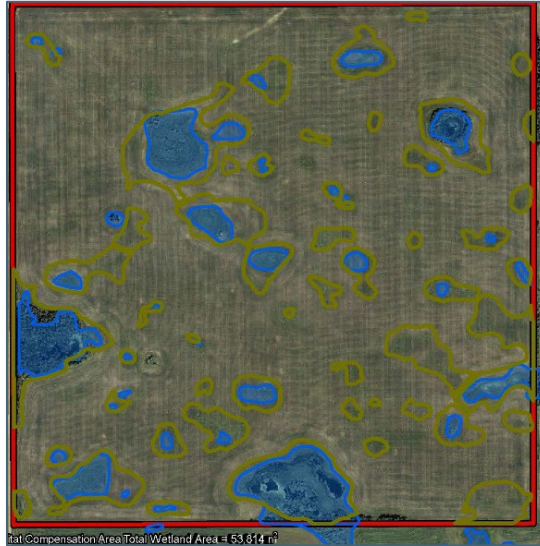
# Trial Habitat Compensation Program





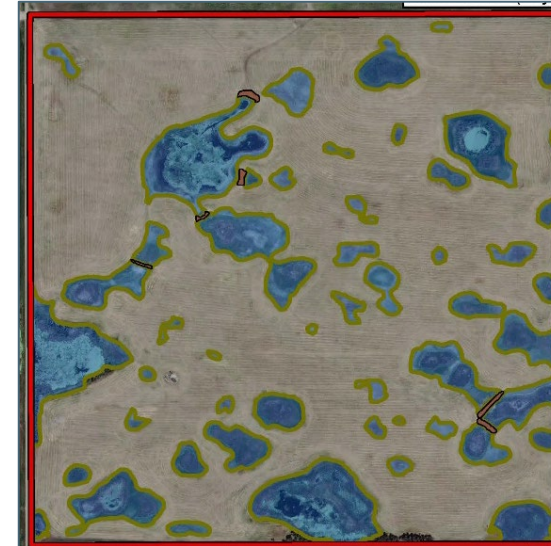
# Planning: Program Design

Pre-Restoration (Baseline – 2014)



Source: ERM

Post-Restoration (2017)



Source: ERM



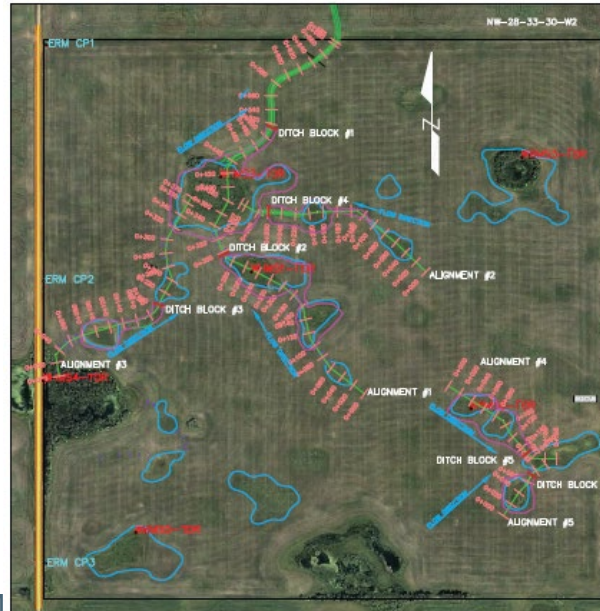
# Planning: Baseline Studies/ Earthworks

## Baseline Studies:

- Wetland ecosystems/hydrology
- Aquatic resources
- Upland ecosystems
- Wildlife

## Earthworks planning and design

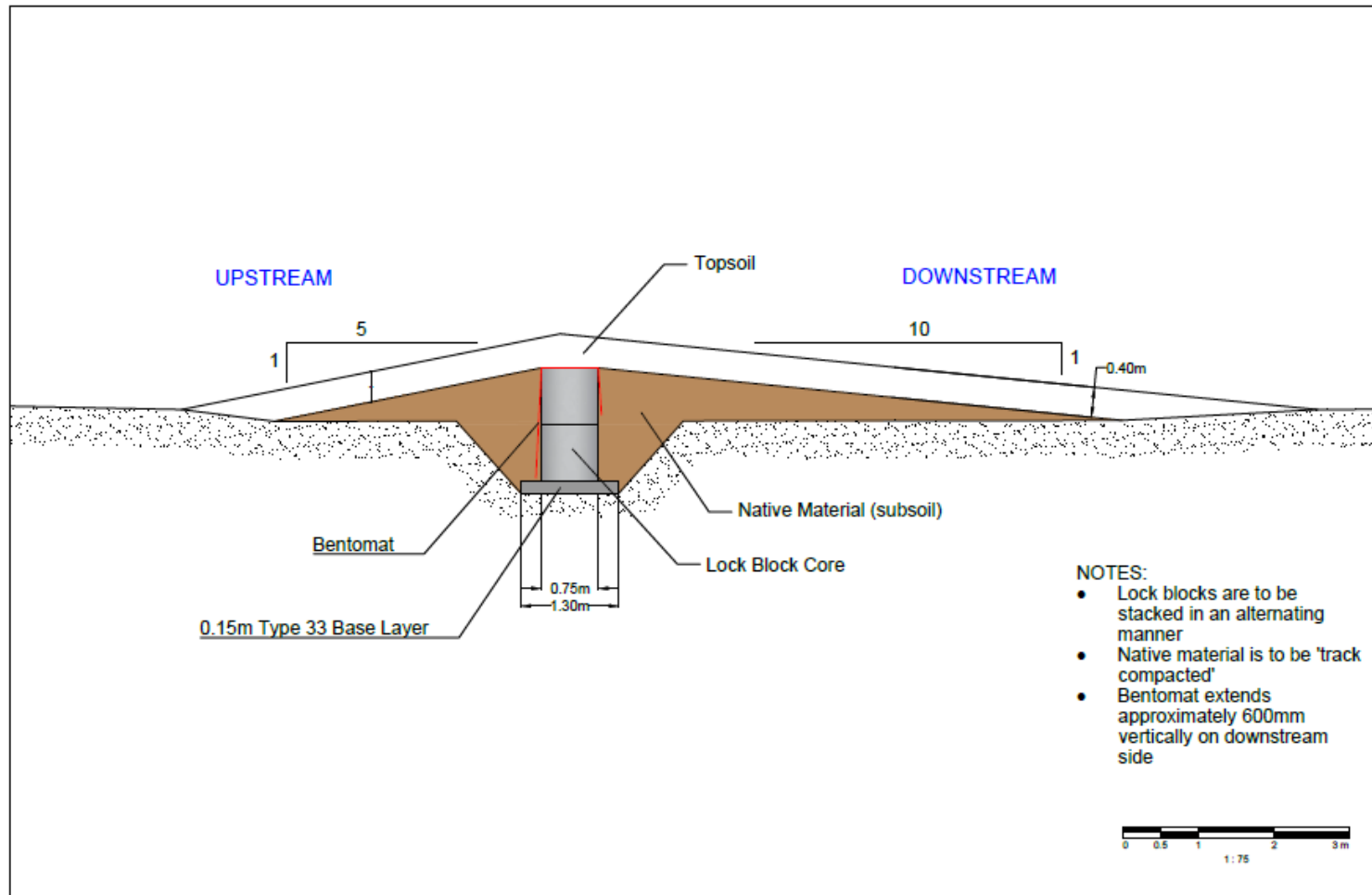
- Site selection
- Topographic surveys
- Ditch-block design
- Seeding plan (upland/wetland)



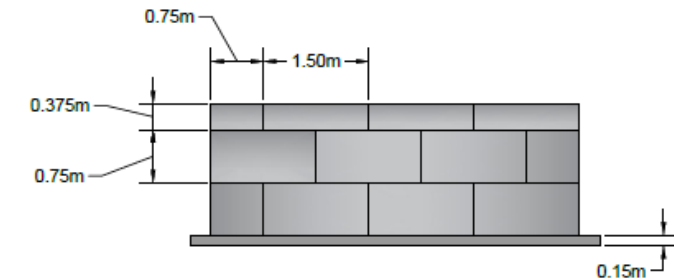
Source: ERM



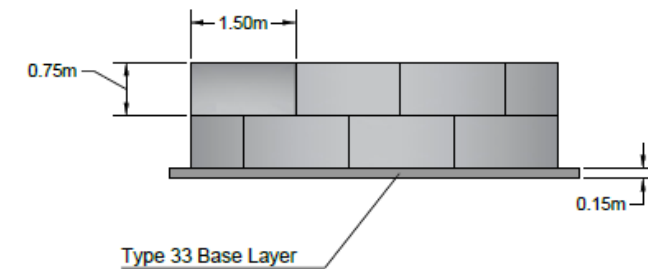
# Ditch Block Design



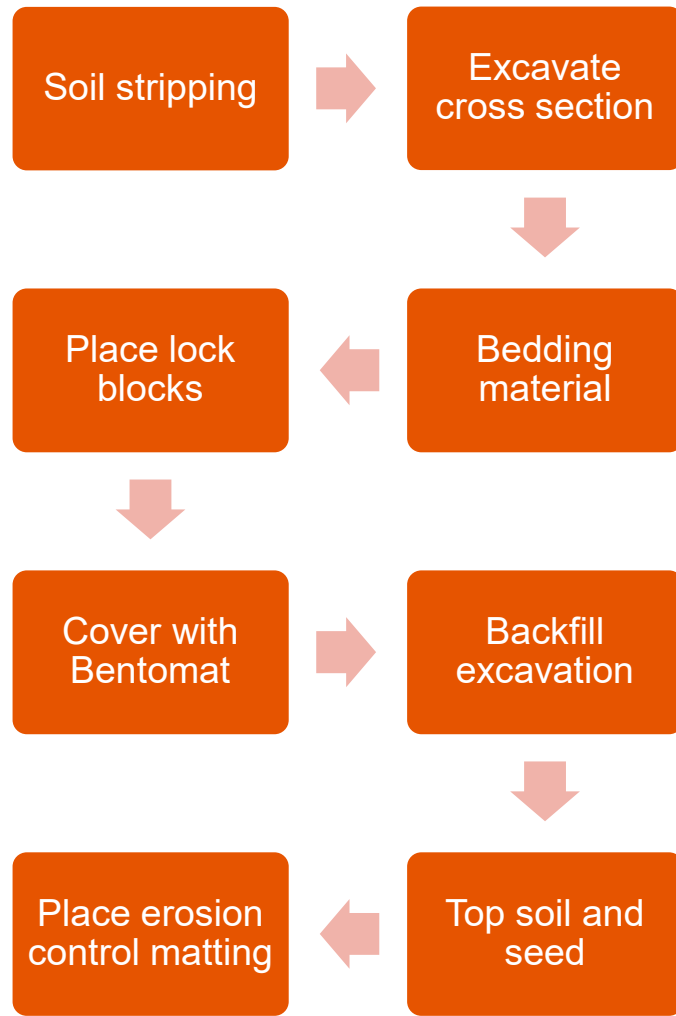
Three Level Design



Two Level Design



# Execution: Ditch Block Construction



Source: THCA Execution Report



# Execution: Seeding

## Wetland vegetation species

- Upland side of the ditch block seeded with wheatgrass species.
- Wetland seeding of ditch blocks using reclaimed native seed bank.
- Willow stakes were planted around ditch blocked wetlands.



Source: BHP



Source: ERM (2)

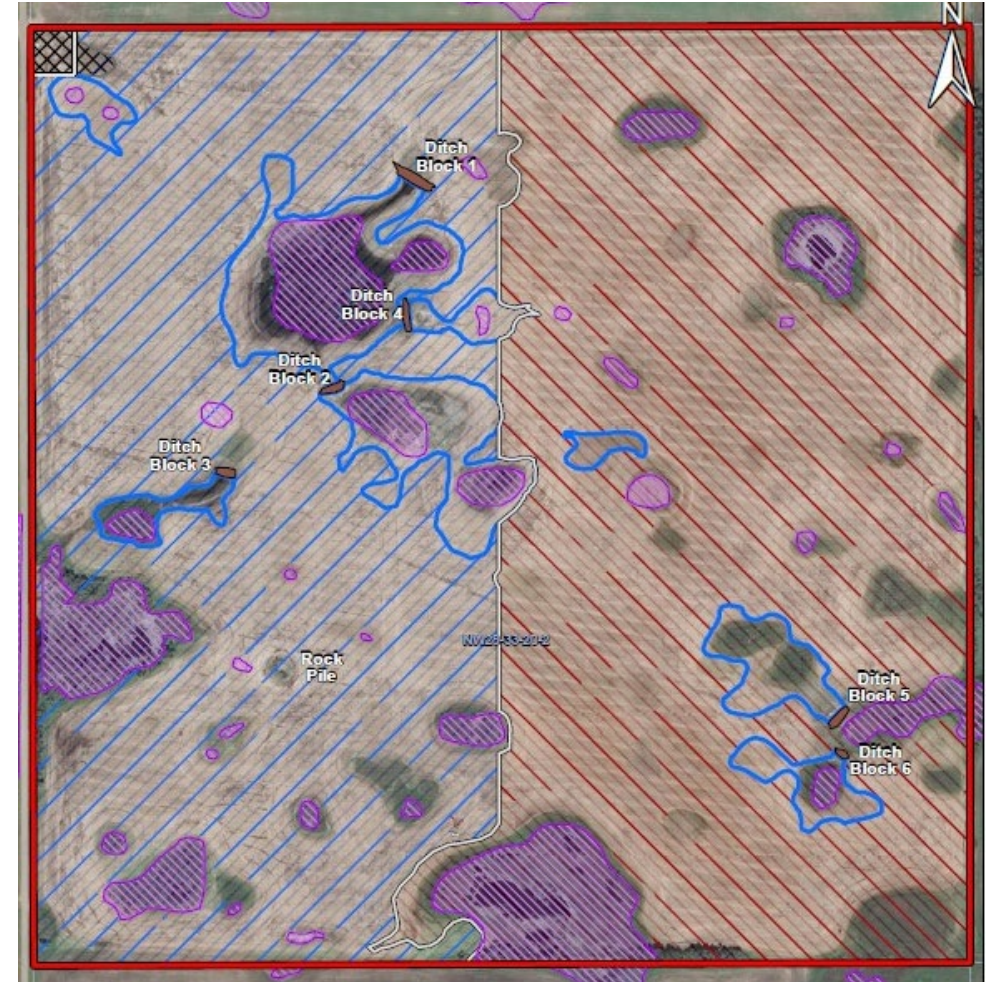


Source: ERM

# Execution Seeding (Spring 2016)

- **Upland vegetation:**

- Two seed mixes for the trial.
- Cover crop was planned however not planted.
- Full-field glyphosate application prior to seeding.
- Ditch and field margins also sprayed with glyphosate.





# Execution Seeding (Spring 2016)

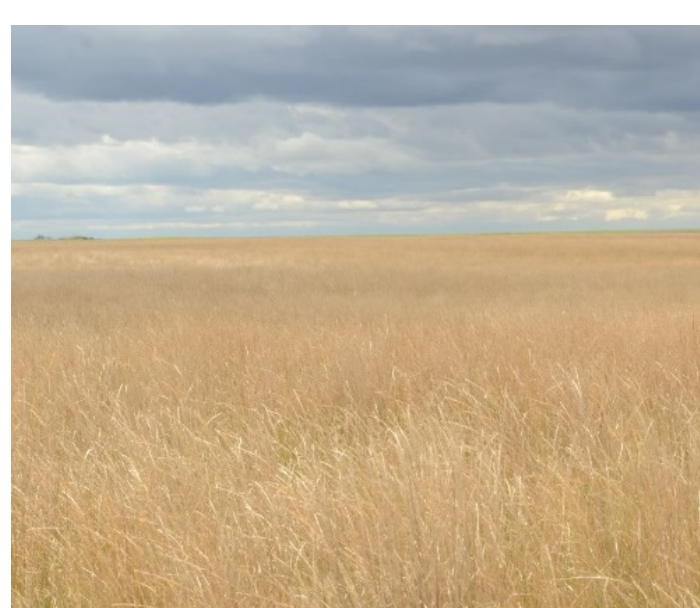
**Mix #2 = West Side**



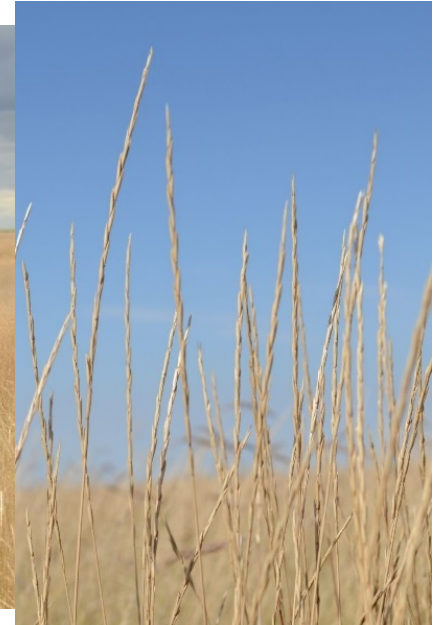
Source: ERM



**Mix #1 = East Side**

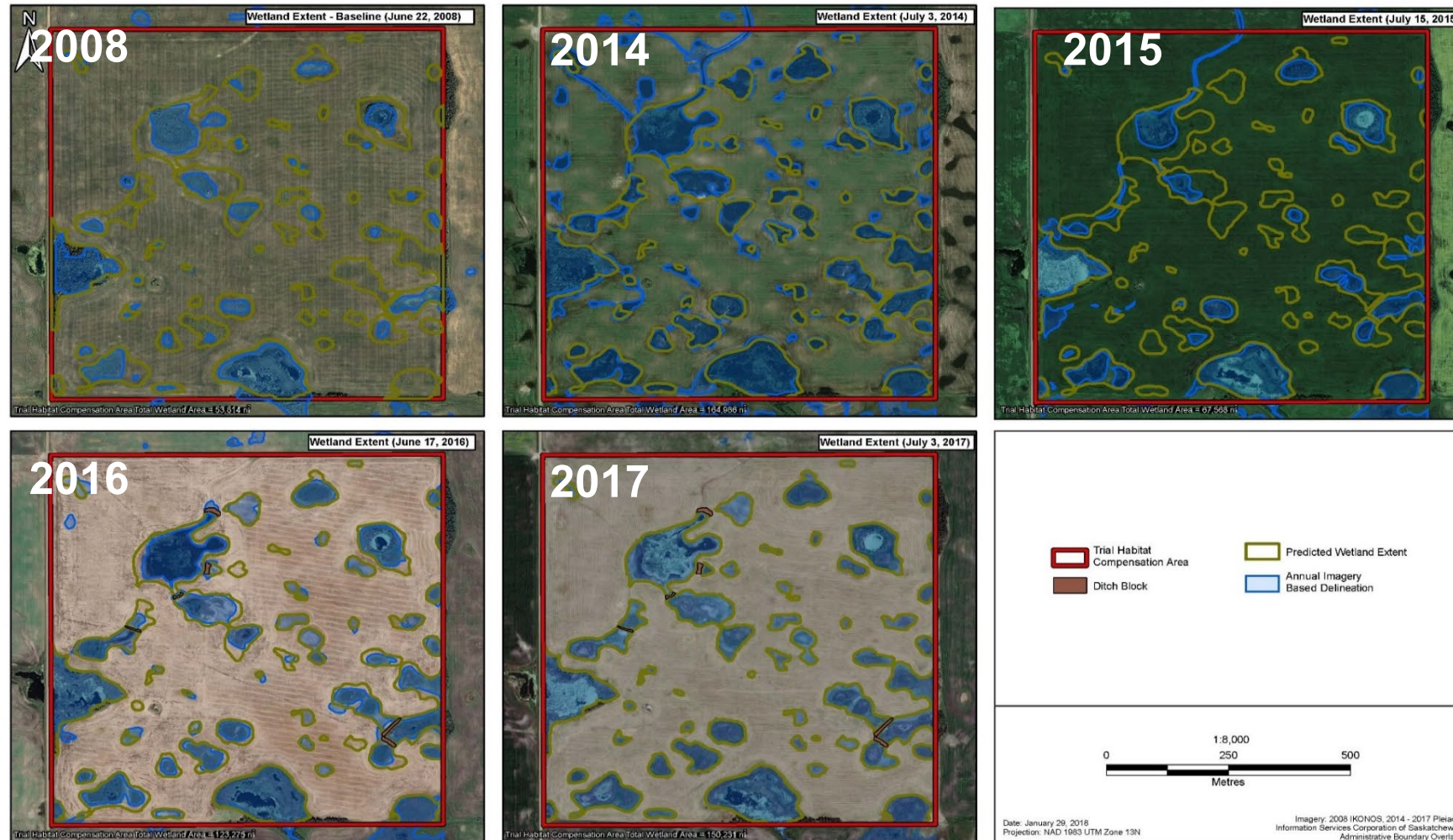


Source: ERM





# Monitoring: Wetland Extent (2008-2017)





# Monitoring: Uplands

Pre-Restoration (Baseline – 2014)



Post-Restoration (2018)



Post-Restoration (2016)



Post-Restoration (2018)



Source: ERM (4)

# Monitoring: Weed Management

## Monthly Weed checks

## Monthly Herbicide Spot Spray

- Field edges, ditch, rock pile – Roundup® (non selective herbicide).
- Seeded areas – Milestone® (selective herbicide, low toxicity).

## Full-field Management

- Mowing - 2016 and 2017- required to control volunteer oats.
- Spray (Milestone) – 2017.

## Re-Seeding

- 2017/ 2018 – Reseeded approximately 2 ha of upland – due to poor establishment.





# Key Lessons Learned

## 57+ Lessons learned to date including but not limited to:

- The program is best executed at a small scale
- Lock block core design worked well
- The importance of cereal crop prior to restoration and correct time of harvest
- The importance of site prep prior to seeding
- 2:1 wetland compensation ratio metric isn't necessarily the best
- Intensive weed monitoring and control is critical
- **Have patience and be flexible in planning and delivery!**



Source: ERM

# Next steps

## 1. Continue environmental monitoring

- Intermittently for the lifetime of the project.

## 2. Adaptive management including

- Weed control as necessary.
  - Incorporate goat grazing for weed control.
  - Re-seeding as necessary.
  - Grazing (> 3 years).
  - Controlled burning (> 15 years).
- ## 3. Planning for next restoration phases within the Habitat Compensation Area.



Source: ERM

# Acknowledgments

Jason Rempel, MSc, PGeo – Partner, ERM Consultants Canada Ltd.

Robyn Pollock, MSc – Project Manager, ERM Consultants Canada Ltd.

Susan Skinner, MSc – Asst. Project Manager, ERM Consultants Canada Ltd.

Wade Brunham, BSc., M.Sc., PWS, EP – Partner & Wetland Lead, ERM Consultants Canada Ltd.

Chet Neufeld, B.Sc., P.Ag. – Native Plant Society of Saskatchewan

Renny Grilz, P.Ag. - Prairie Conservation Services

Reed Hentze, P. Biol., PWS, Manager Environment, WSP Canada Inc.

Cole Kirkham, BSc, P.Biol. – Environmental Scientist, Wildlife and Wildlife Habitat, WSP Canada Inc.

Anthony Lambert, P. Eng. – Manager Canadian Closed Sites, BHP

Diane Taylor Photography



# Questions and Answers



Source: Diane Taylor Photography

**BHP**