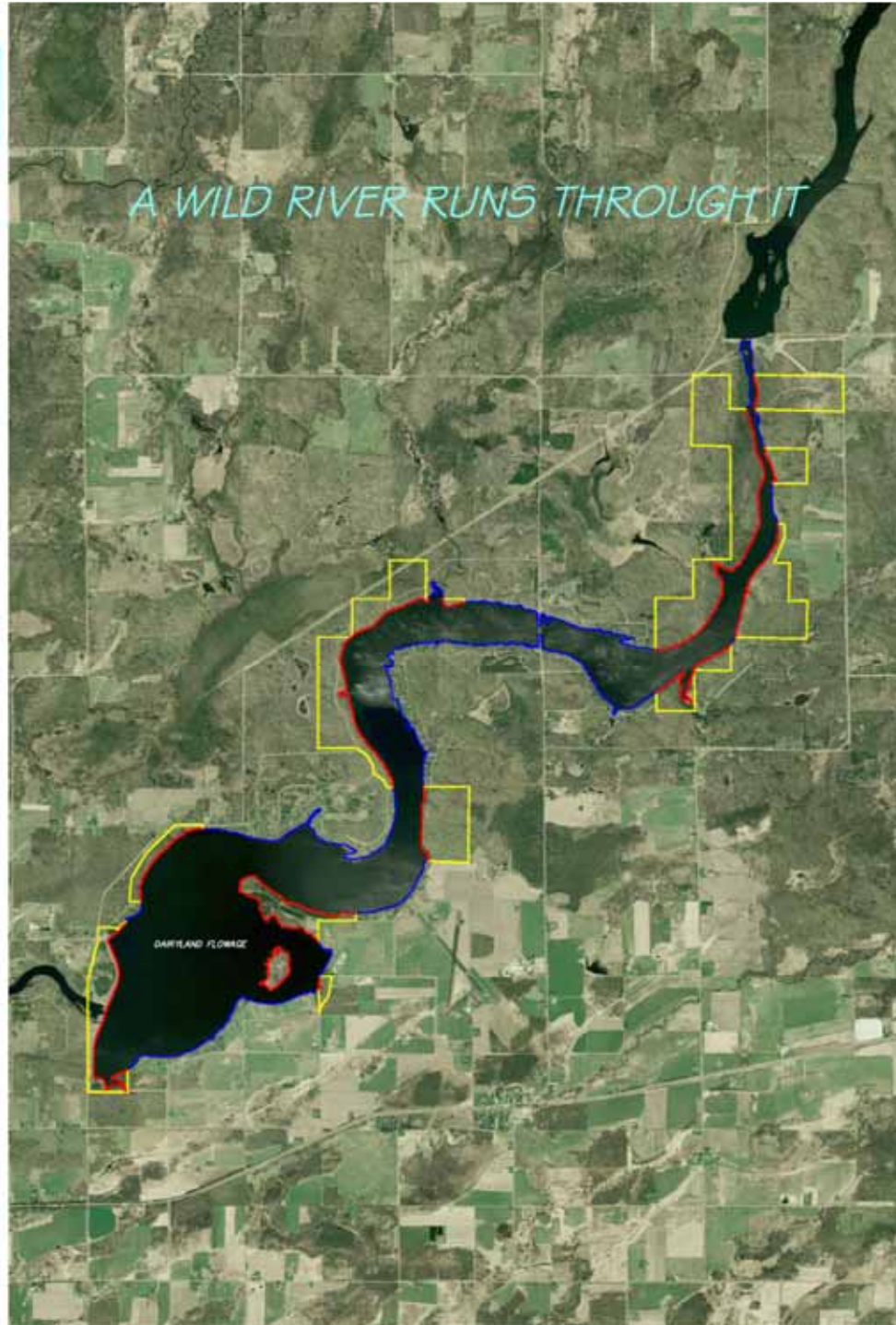
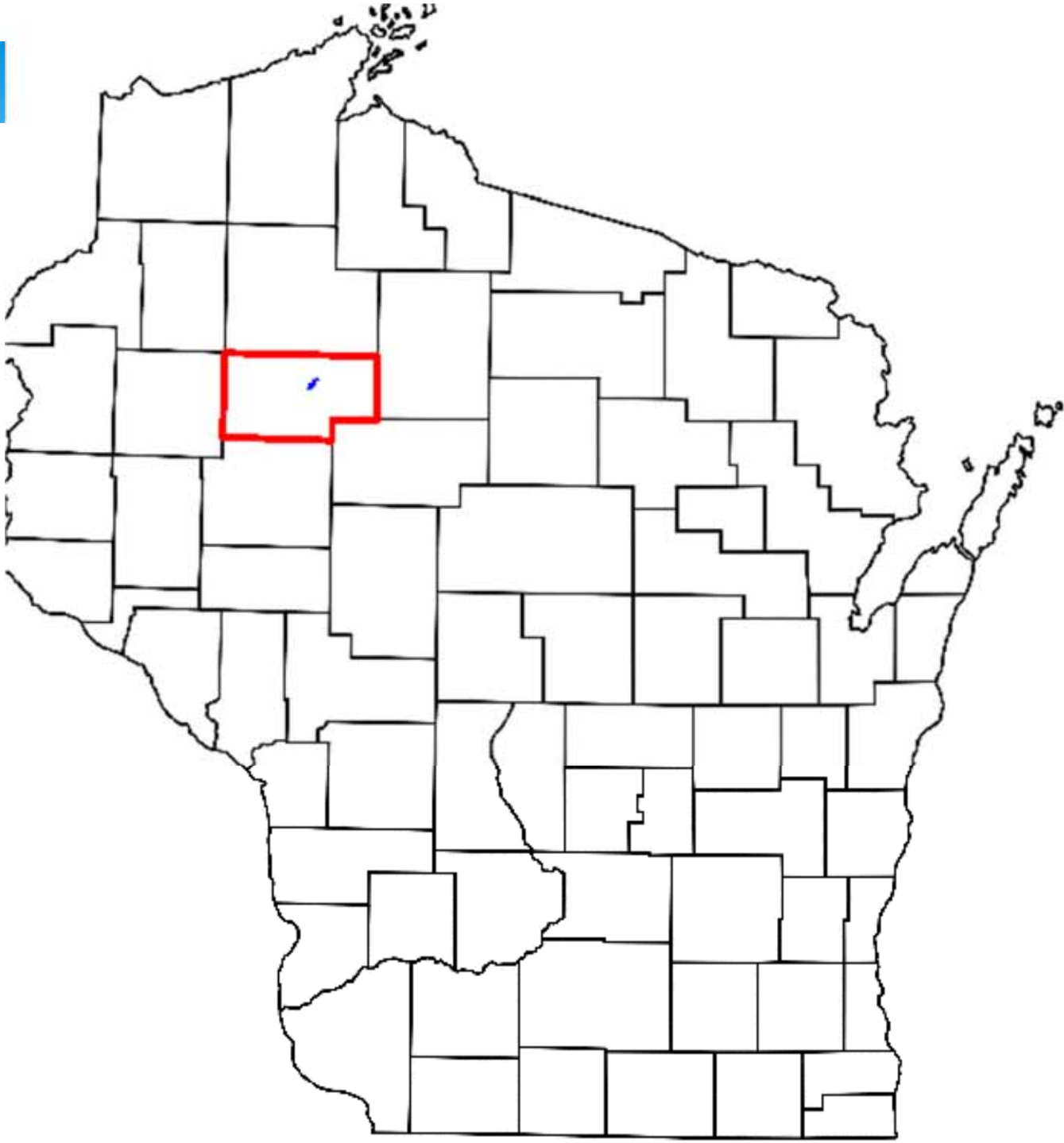
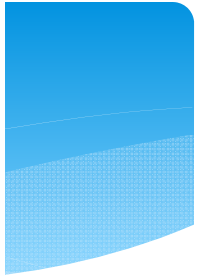


A WILD RIVER RUNS THROUGH IT



DARTLAND FLOWAGE









FLAMBEAU HYDRO DEVELOPMENT  
LADYSMITH WISC.

8-19-1949

DUBOIS STUDIO





09/17/2007



08/24/2007





08/24/2007







# Lakes are like fields...

Poor  
lake

200 pounds/acre

Pastured  
timber

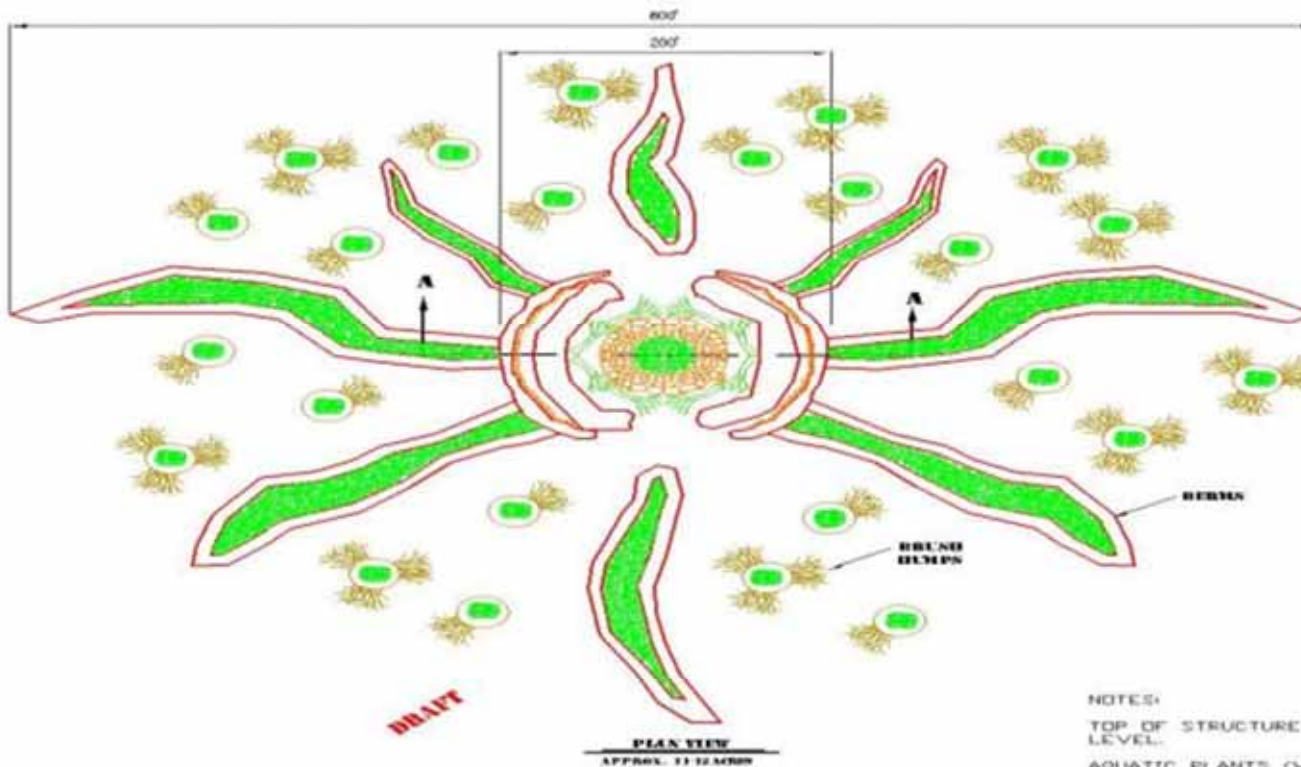
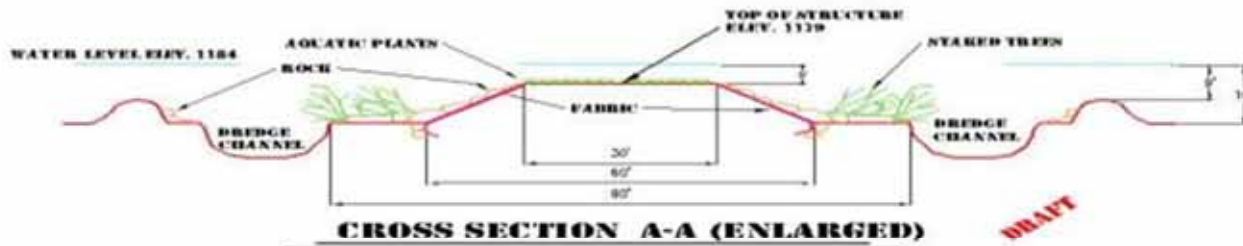
1-2 tons/acre

Good  
lake

400 pounds/acre

Irrigated  
agricultural  
crop

15-20 tons/acre



**PRODUCTION ISLANDS**

PRODUCTION ISLANDS ARE DESIGNED TO INCREASE SHALLOW WATER HABITAT, WHICH WILL HELP IMPROVE PRODUCTION OF FORAGE FISH AND HABITAT FOR GAMEFISH

**NOTES:**

TOP OF STRUCTURE SHALL BE > 5' BELOW NORMAL WATER LEVEL.

AQUATIC PLANTS (WILD CELERY) WILL BE PLANTED ON TOP OF STRUCTURE.

STRUCTURE SIZES AND SHAPES WILL VARY.

STRUCTURES WILL BE PLACED IN AREAS WITH NORMAL WATER DEPTHS OF 0'-20' ONLY.

STRUCTURE SIDE SLOPES WILL BE FLATTER THEN 1:1.























10/05/2007











**Before**



**After**

**East Point Ridge (1)**



**Long Point Ridge (2)**



**North Point Knob (3)**



**South Point Knob (4)**

















03/05/2008

Musky, walleye,  
smallmouth bass, channel catfish

Yellow bullhead, bluegill,  
crappie, yellow perch

Water bugs

Larvae & nymphs

Shrimps, crayfish,  
macro invertebrates

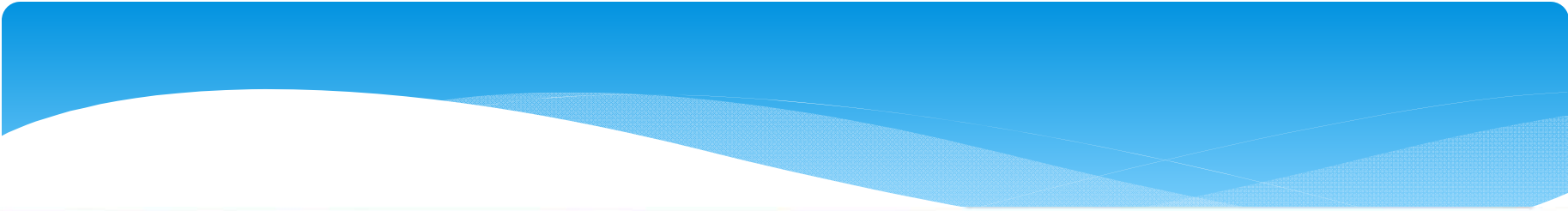
White sucker, emerald  
shiner, trout perch, lake  
sturgeon, mud puppies

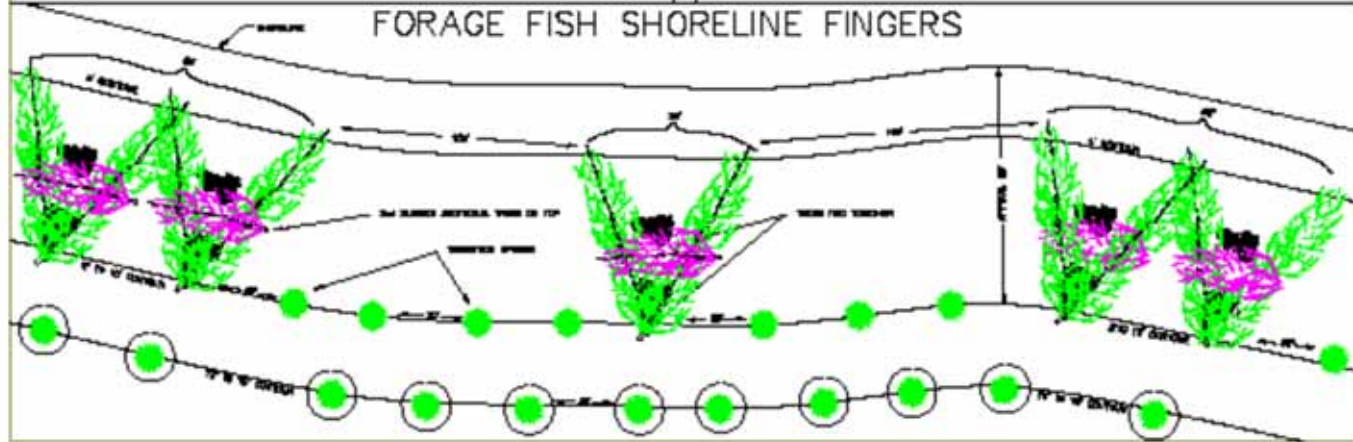
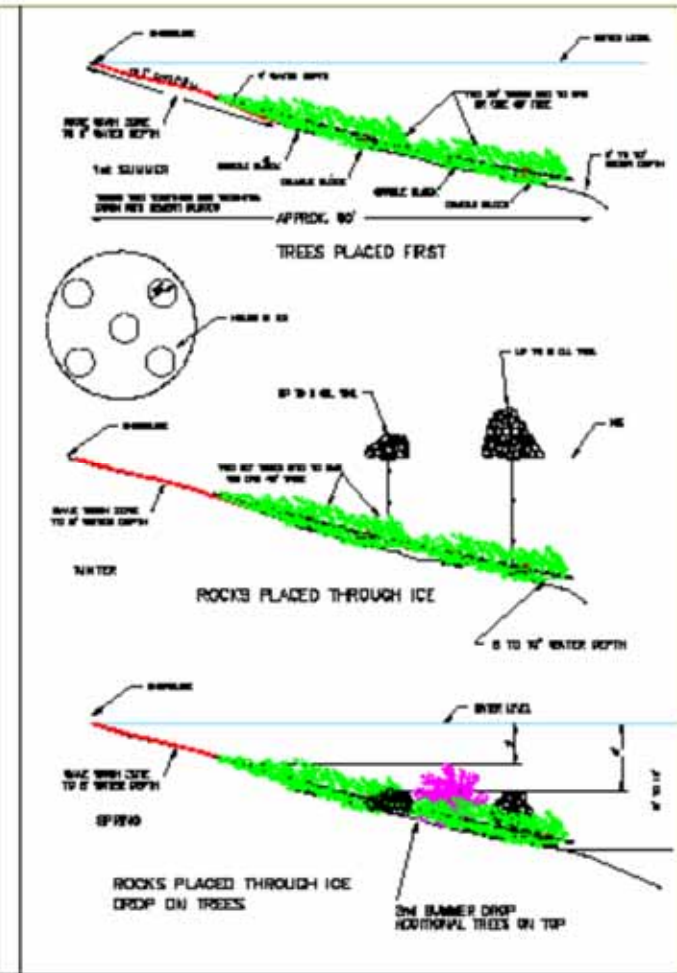
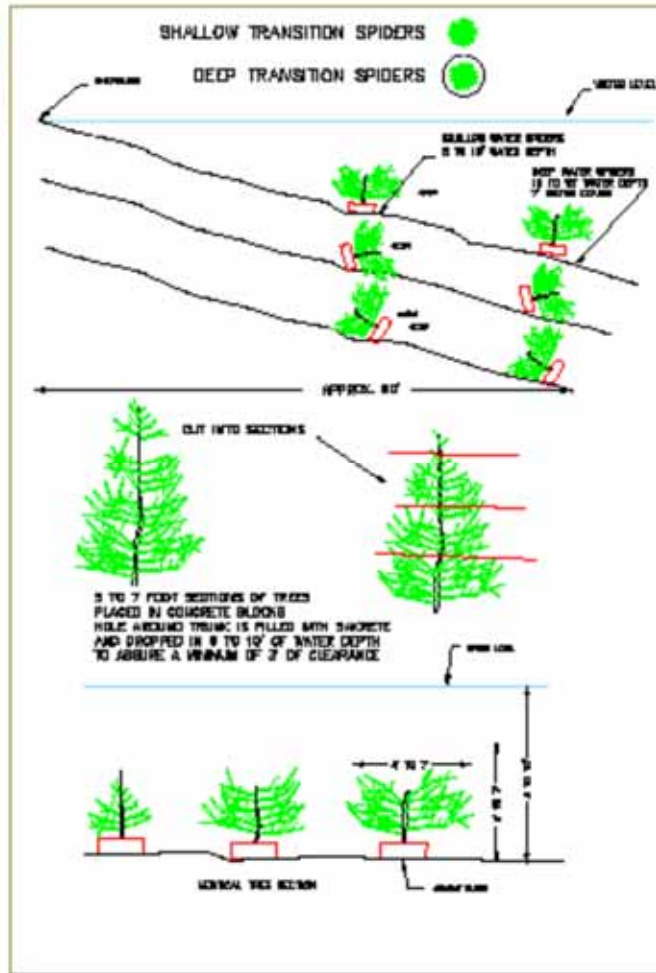
Tadpoles

Zooplankton

Phytoplankton

Algae







04/16/2008









04/16/2008







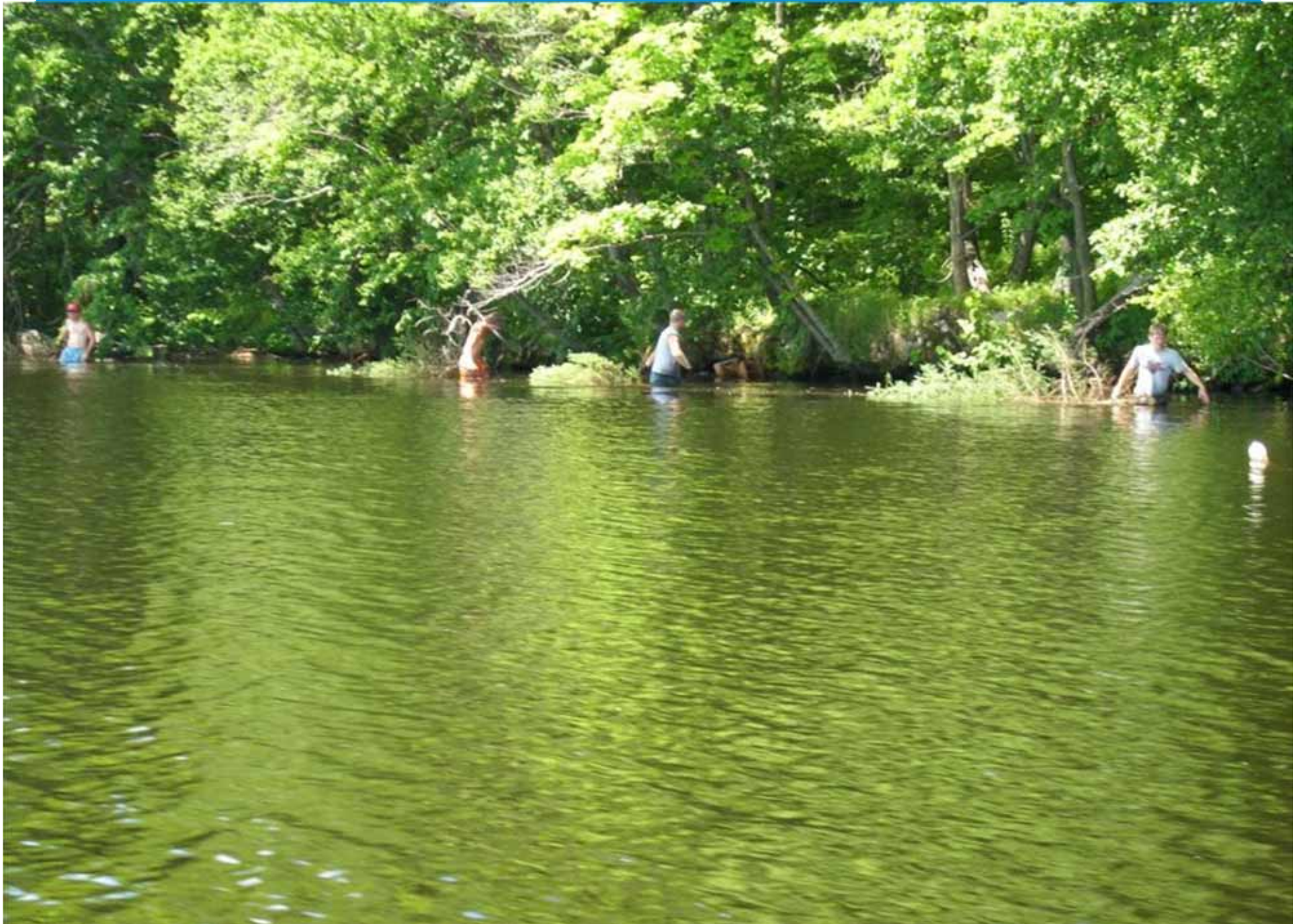






2011/07/05 08:55



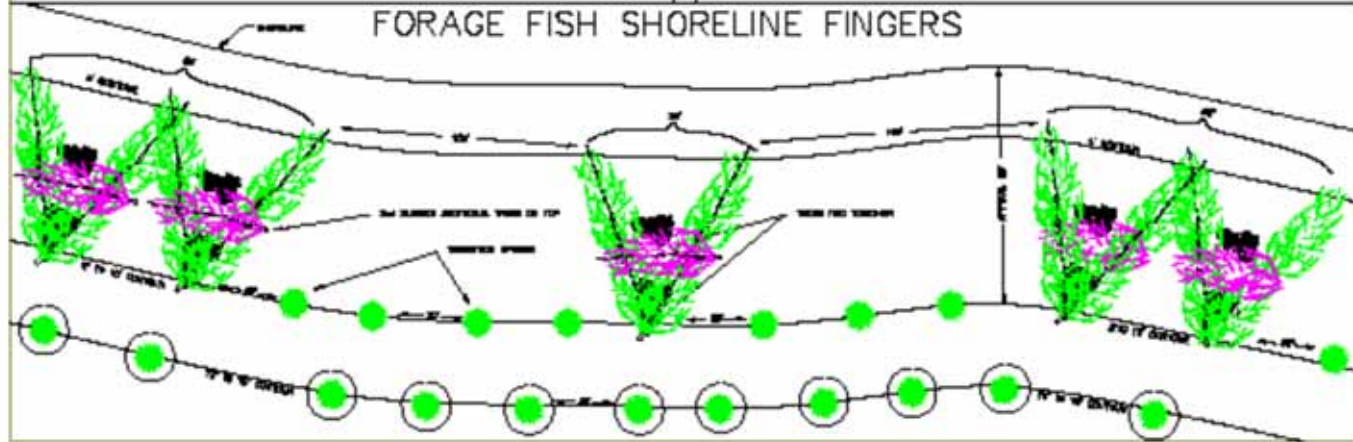
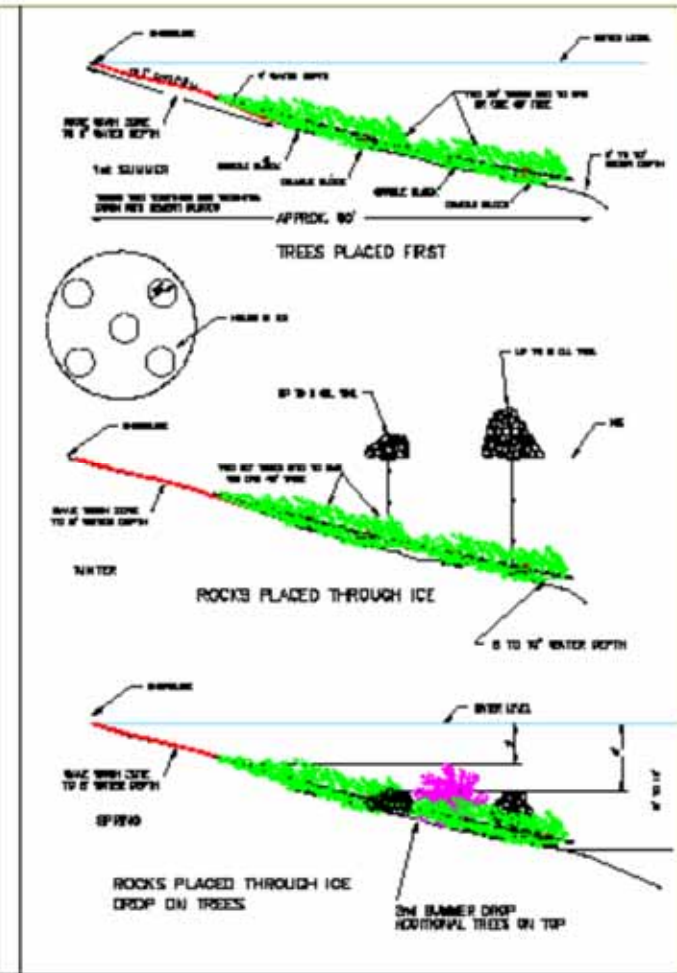
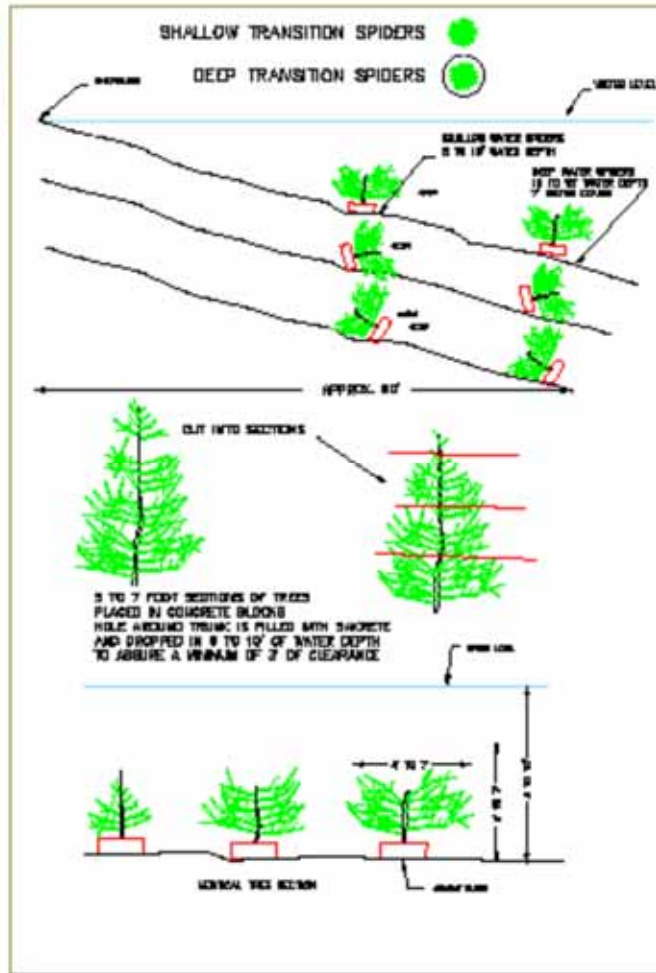




























2011/06/30 09:16





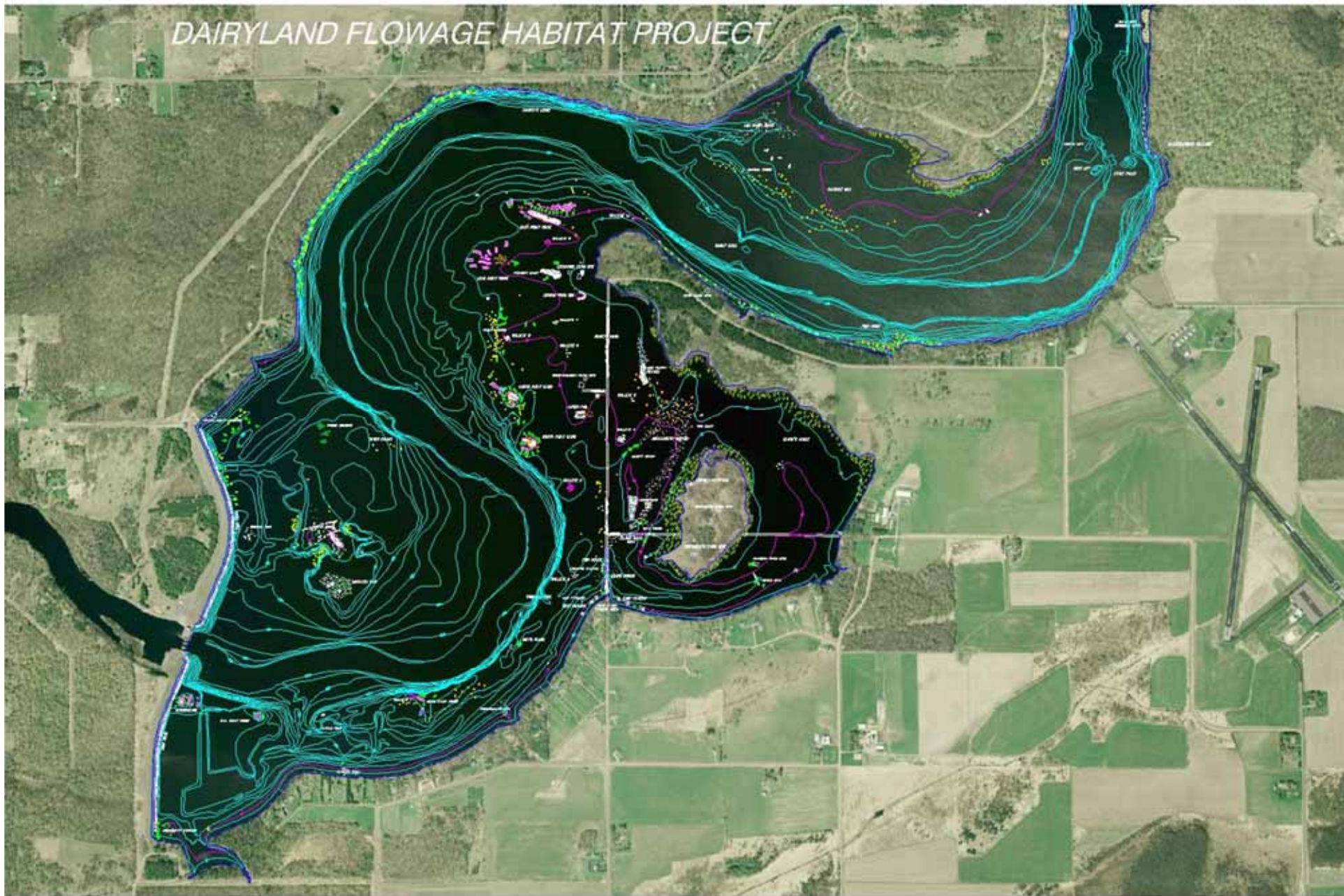
# Dairyland Flowage Forage Production (Below Matlack Bridge to Dam)

- 15.7 miles of main flowage shoreline (Dairyland Power, 7.0 miles)
- 4.1 miles of main flowage shoreline improved and protected with production structures.
- 26.1% main flowage shoreline improved and protected.
- 29.8 acres of improved littoral zone production structures.

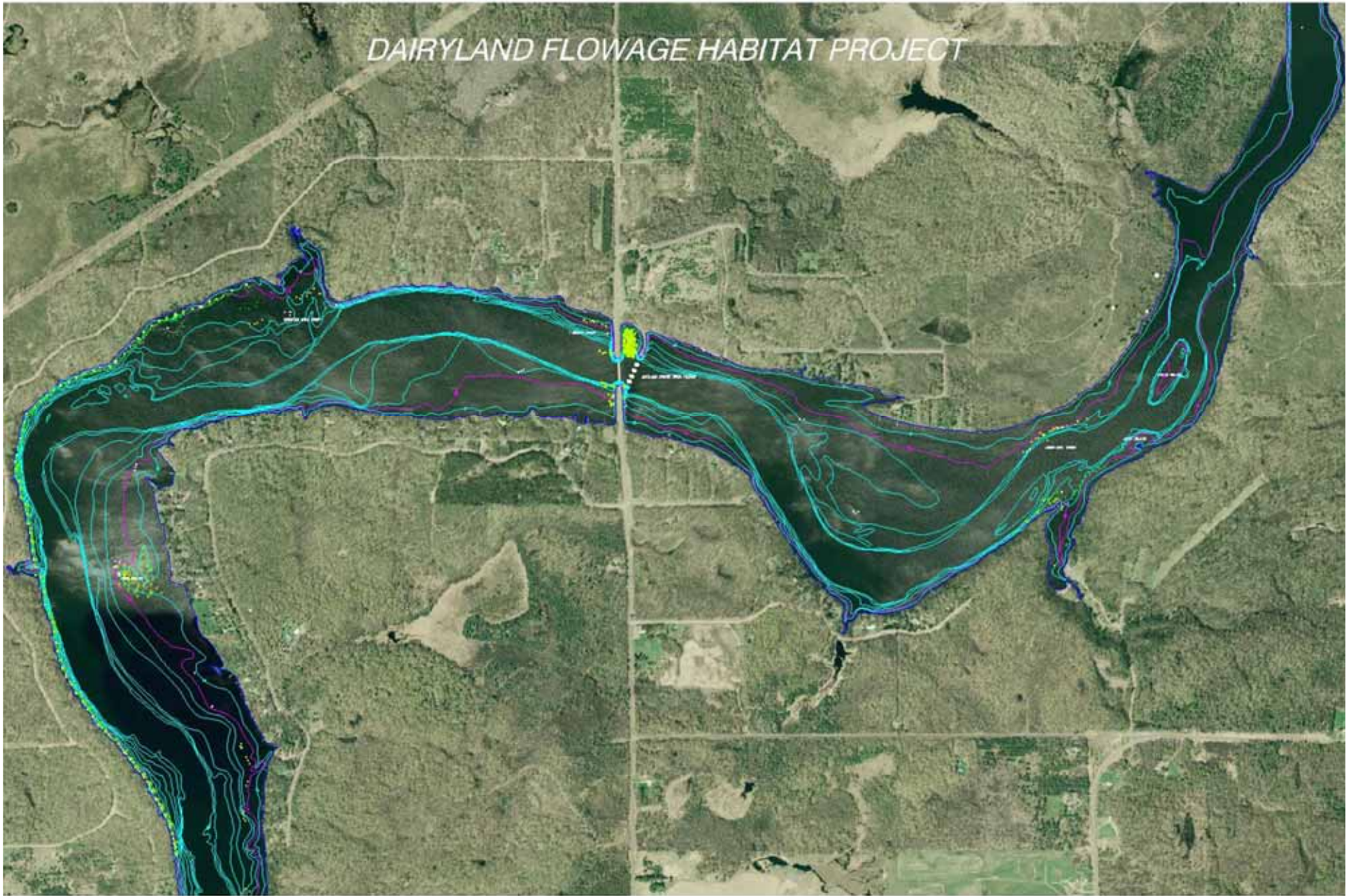
29.8 acres improved of 309.3 acres under 8 ft. = 9.6% of all littoral zone in the main flowage area below Matlack bridge.

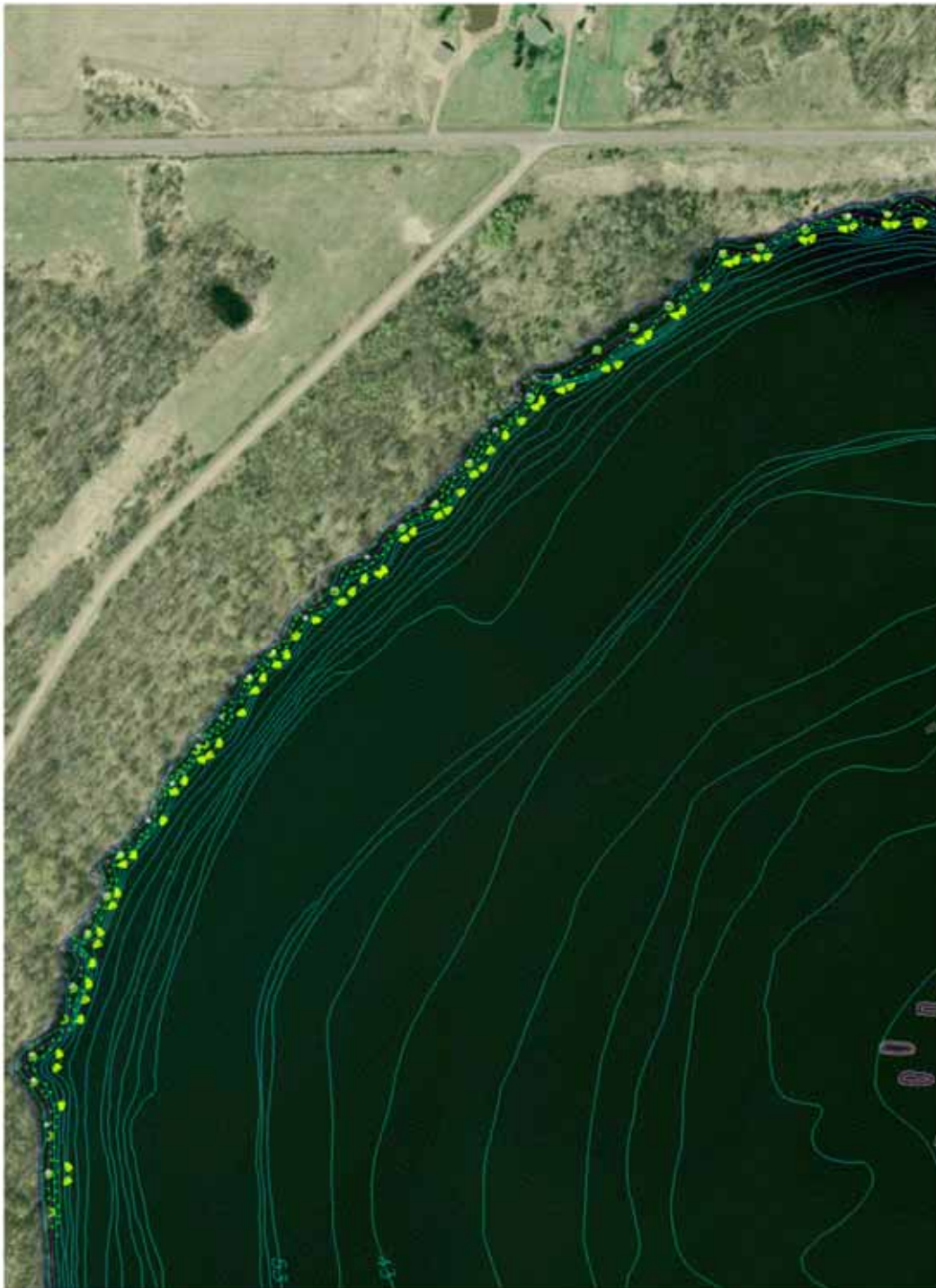


DAIRYLAND FLOWAGE HABITAT PROJECT



*DAIRYLAND FLOWAGE HABITAT PROJECT*































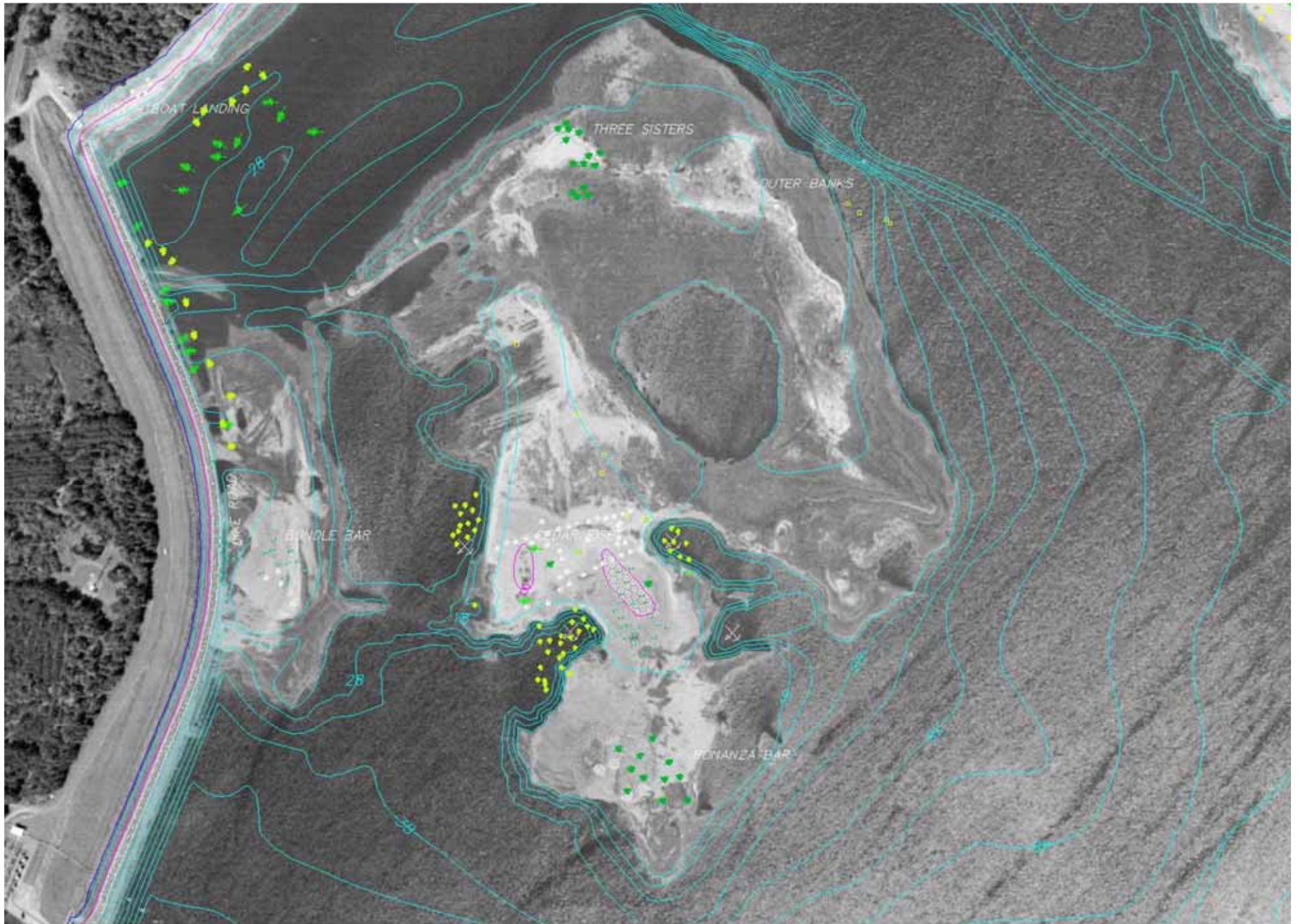








04/16/2008













2011/07/11 14:31





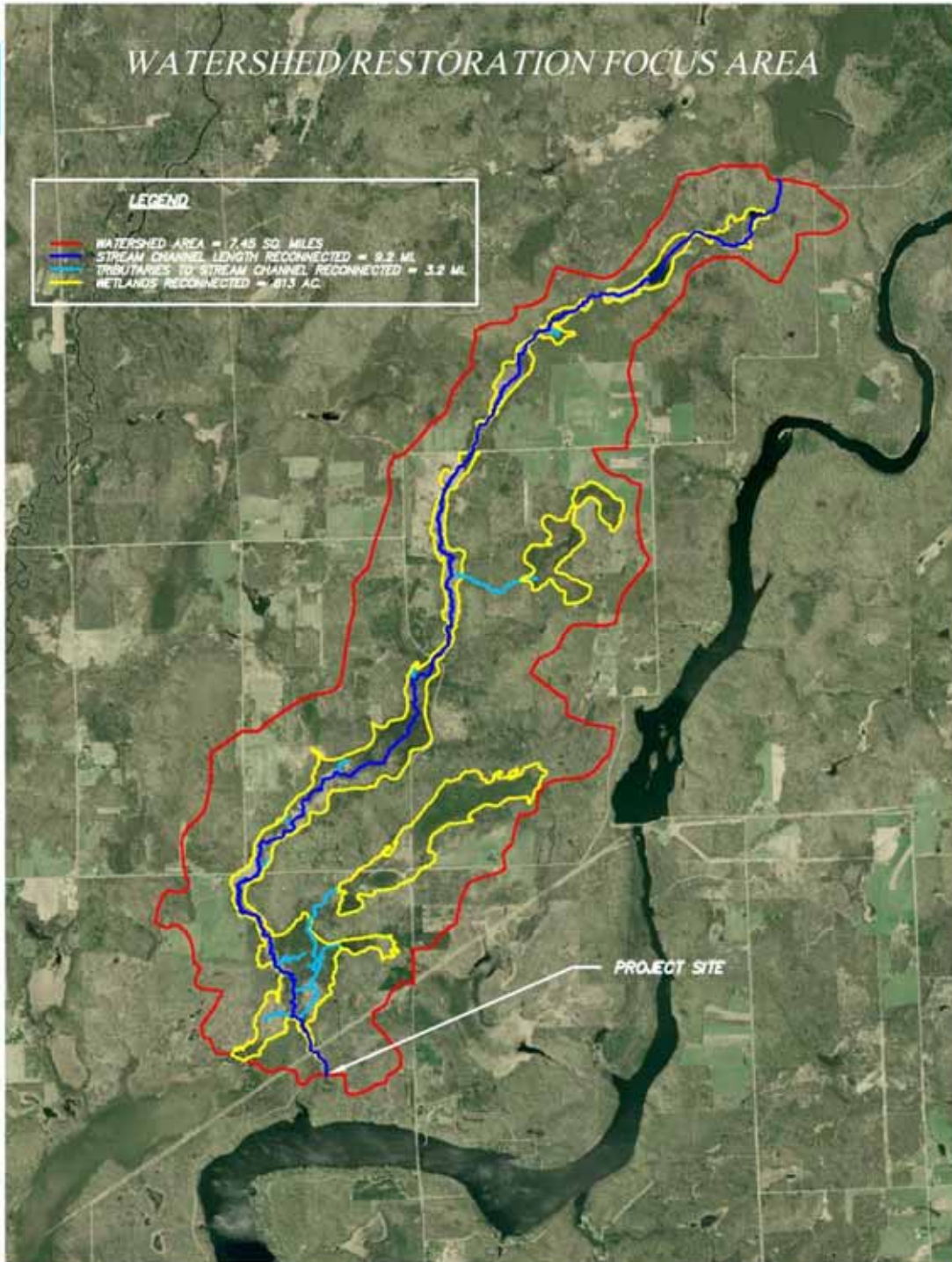




# WATERSHED/RESTORATION FOCUS AREA

**LEGEND**

- WATERSHED AREA = 7.45 SQ. MILES
- STREAM CHANNEL LENGTH RECONNECTED = 9.2 MI.
- TRIBUTARIES TO STREAM CHANNEL RECONNECTED = 3.2 MI.
- WETLANDS RECONNECTED = 413 AC.



PROJECT SITE















I BRIDGE CRIBS

MATLACK BRIDGE ROCK PILINGS



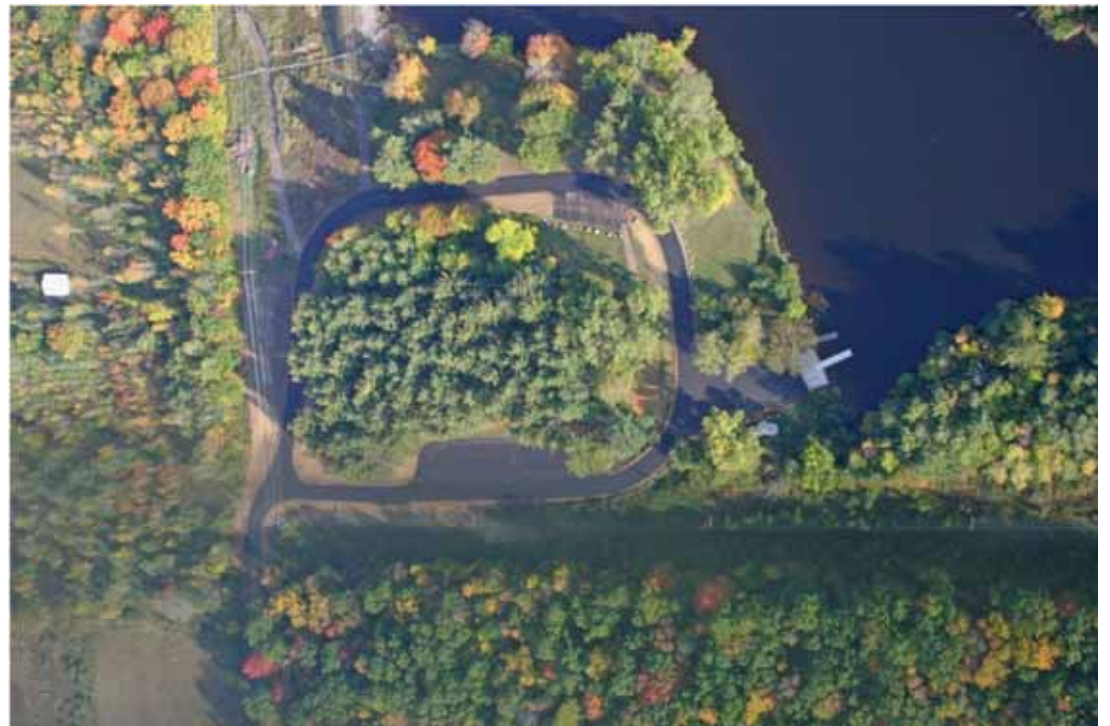


10/04/2007





Pre-drawdown (2007)



Post-drawdown (2007)



Pre-drawdown (2007)

Post-drawdown (2007)



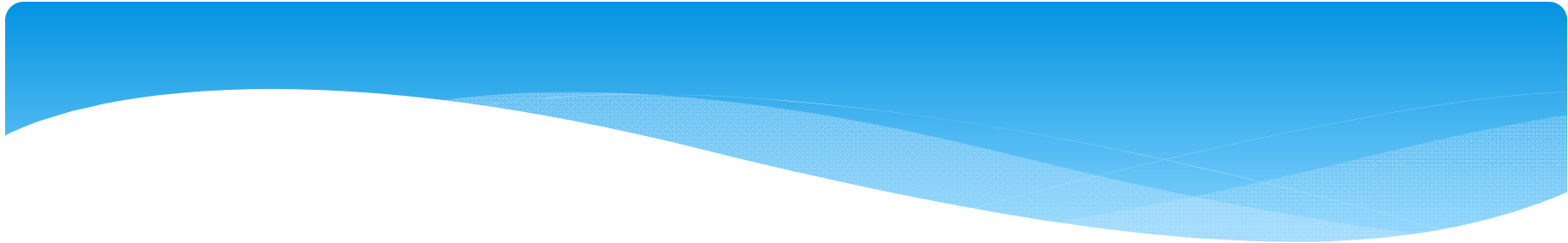


2009/07/16 03:13











2009/07/16 03:39















# FISH BOARD 2012



# Project Assessment

- \* Best method to gauge project's success or failure is to look at the reservoir's fishery
  - \* Creel survey(s)
  - \* Netting
  - \* Electrofishing
  - \* Combination?
- \* Netting and creel survey data limited
- \* Numerous electrofishing surveys of the reservoir conducted during the 1990's and 2000's by Dairyland Power Cooperative (DPC)
  - \* Not conducted with the habitat project in mind
  - \* Data was, however, available and easily accessible
- \* Based on the resources, a decision was made to compare reservoir electrofishing data from pre- and post-drawdown years

# Pre-drawdown (Baseline) Survey Data

- \* Electrofishing surveys conducted in the lower half of the reservoir
  - \* Boom shocking
  - \* Conducted at night
  - \* Three person crew, i.e., two netters and one driver
- \* Spring surveys, i.e., April and/or May
- \* 1993 and 1994 surveys matched criteria and used as baseline
- \* Additional observations
  - \* No habitat improvement work done on the reservoir from 1993 through 2006 (other than fish cribs)
  - \* No significant changes in daily bag limits or fish size limits
    - \* Walleye
      - \* No size limit prior to 1998
      - \* Only one fish over 14" from 1998 to present
- \* Reservoir water quality data collected by Dairyland Power Cooperative on various occasions from 1993 through 2006 showed little annual variability
  - \* Dissolved oxygen
  - \* Temperature
  - \* pH
  - \* Specific conductance
  - \* Alkalinity
  - \* Secchi depth
  - \* Apparent color

# Post-drawdown Survey Data

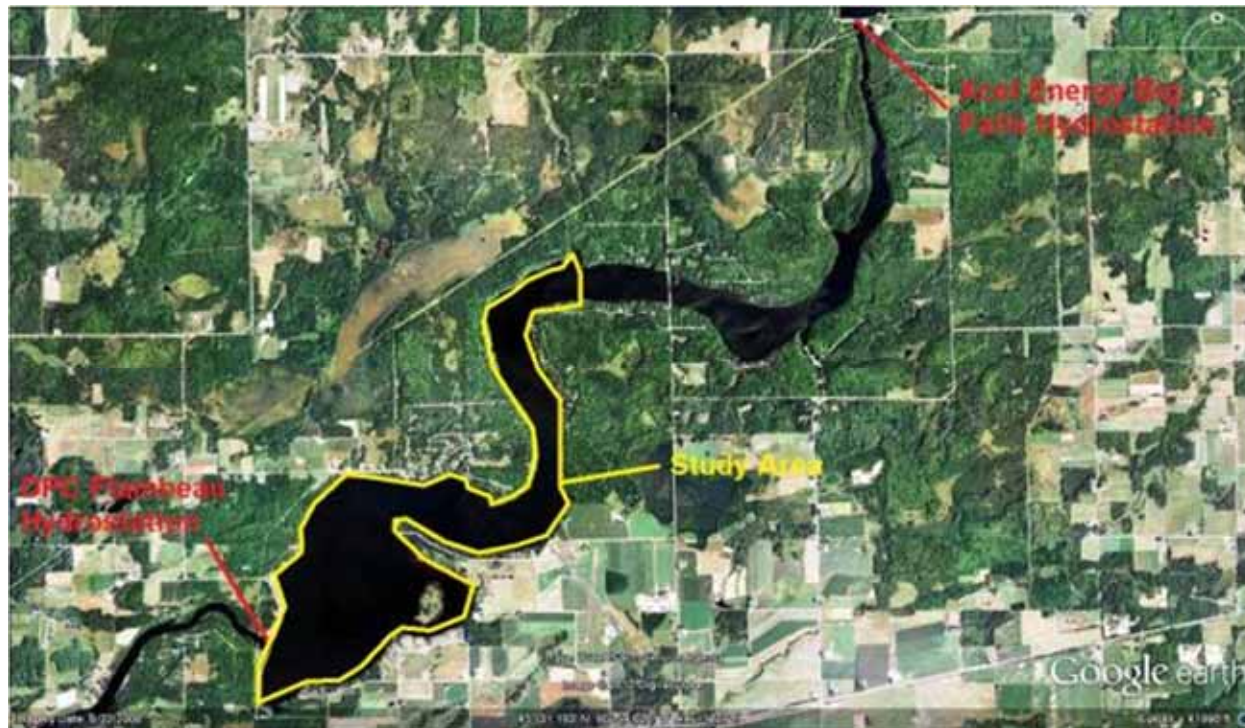
- \* Same as pre-drawdown data
  - \* Electrofishing surveys conducted in the lower half of the reservoir
    - \* Boom shocking
    - \* Conducted at night
    - \* Three person crew, i.e., two netters and one driver
  - \* Spring surveys, i.e., April and/or May
- \* So far, data collected during 2009, 2010, and 2011

# Survey Equipment

- \* Same electrofishing gear used for pre- and post-drawdown surveys
  - \* 20' Kann boat
  - \* Coffelt Mark-22/Smith-Root VP-15B electrofishing unit
  - \* DC pulse current (Complex Pulse System)
  - \* 400 to 600 volts
  - \* 0.5 to 3.0 amps
  - \* Nets with ¼" mesh
  - \* 3-person crew (1 driver and 2 netters)



# Study Area





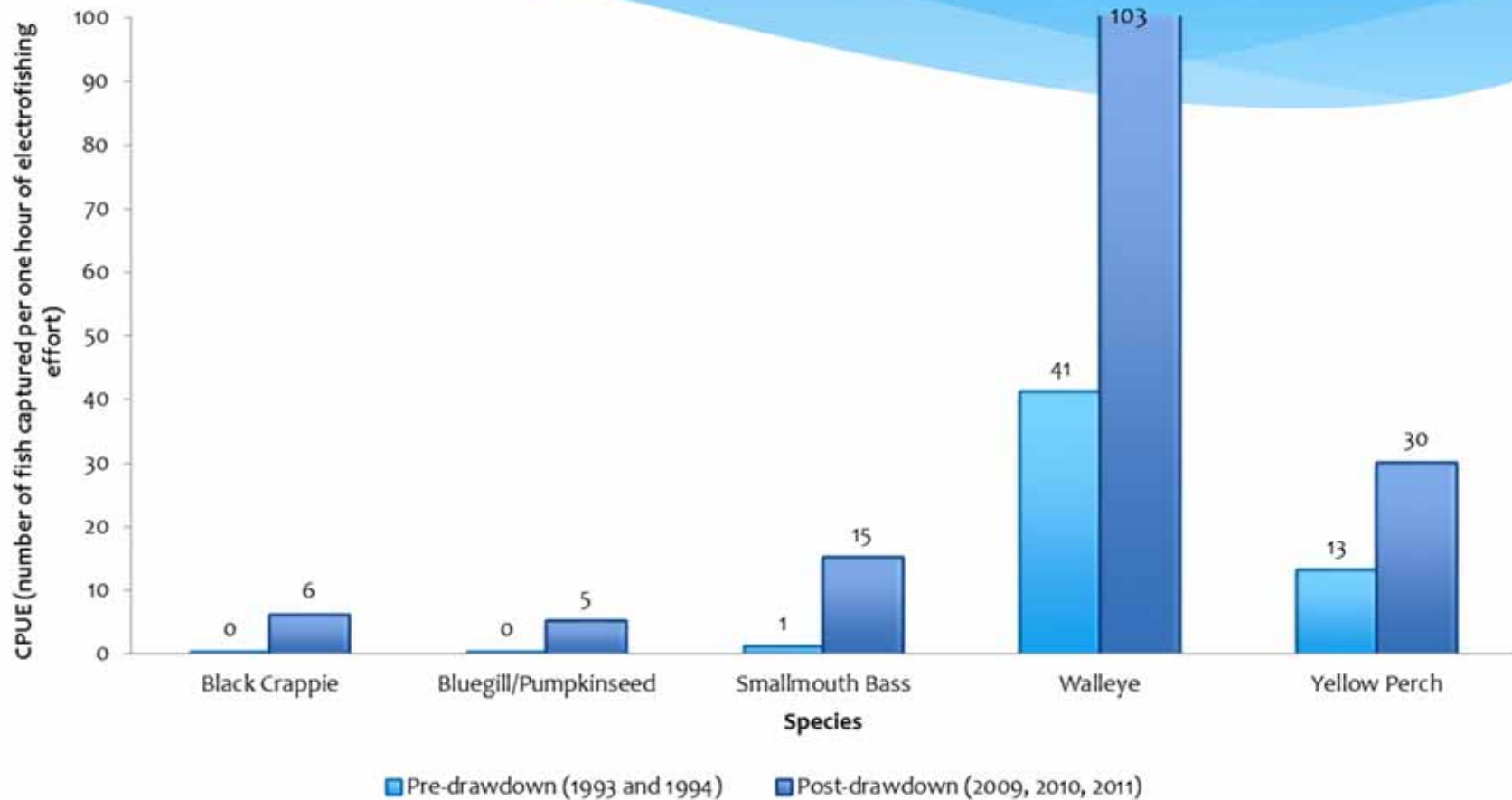
# Target Species

- \* All species encountered during surveys were collected
- \* Select gamefish picked as target species
  - \* Black crappie (*Pomoxis nigromaculatus*)
  - \* Bluegill (*Lepomis macrochirus*)
  - \* Smallmouth bass (*Micropterus dolomieu*)
  - \* Walleye (*Sander vitreus*)
  - \* Yellow perch (*Perca flavescens*)
- \* Target species comparison
  - \* Mean length(s)
  - \* CPUE (number of fish captured per hour of electrofishing effort)

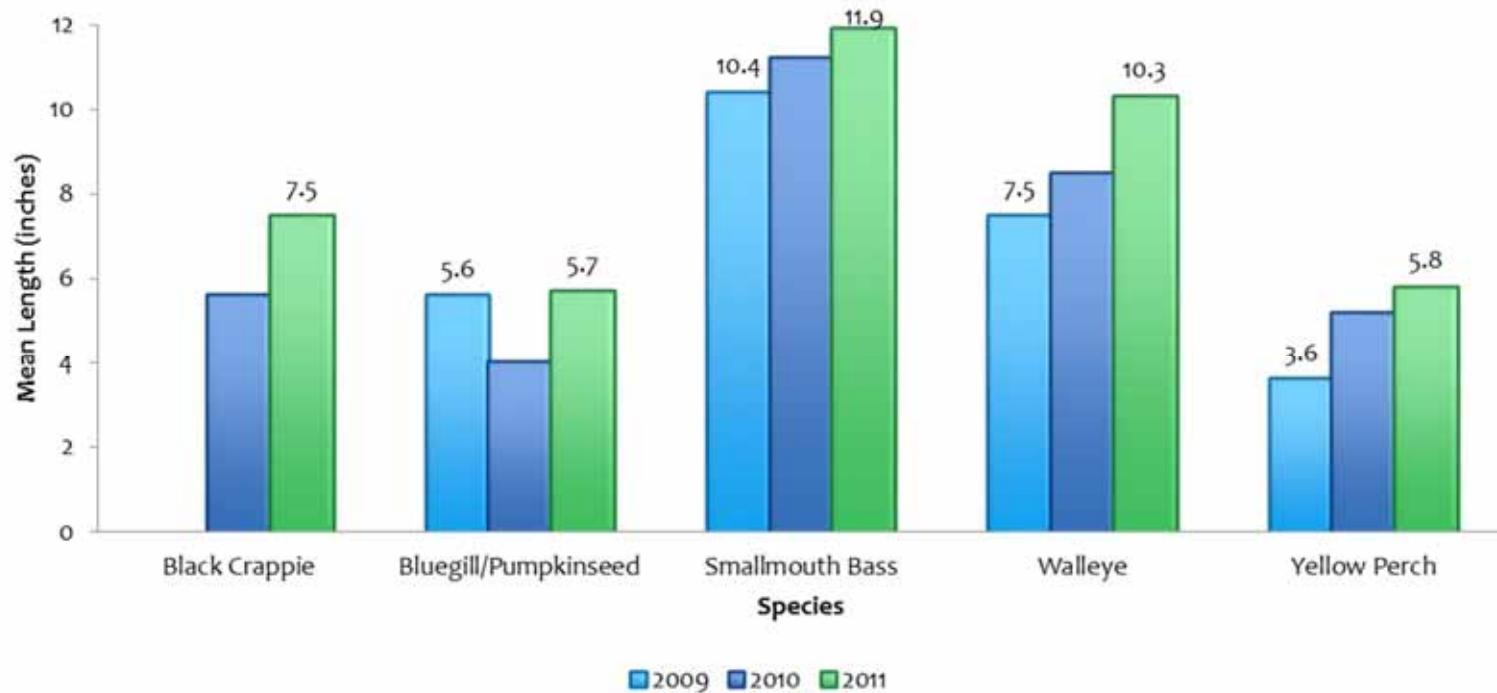
# Results



# Pre- Versus Post-drawdown Target Species Electrofishing CPUE



# Post-drawdown Target Species Mean Lengths by Year



# Observations

- \* Black crappie
  - \* One black crappie was collected during the pre-drawdown surveys and 46 have been collected in the post-drawdown surveys
- \* Bluegill/pumpkinseed
  - \* No bluegill/pumpkinseed were collected during the pre-drawdown surveys and 38 have been collected in the post-drawdown surveys
- \* Smallmouth bass
  - \* Four smallmouth bass were collected during the pre-drawdown surveys and 118 have been collected in the post-drawdown surveys

# Observations (cont.)

- \* General

- \* CPUE for each target species, post-drawdown, is at least 2.3-times greater than each species' pre-drawdown CPUE
- \* Mean length of captured fish for each target species has increased in each of the three post-drawdown years with the exception of black crappie (no fish in 2009 and increase in mean length from 2010 to 2011) and bluegill/pumpkinseed
- \* Post-drawdown
  - \* Richer species composition
  - \* Increased abundance(s)
  - \* Increased average size of survey fish

# Future Plans

- \* Permit to place habitat structure on the bed of the Dairyland Reservoir extended through November 1, 2014
  - \* Continue placing new structure in select areas
  - \* Maintain or “season” existing structures
- \* Continue with spring electrofishing surveys
- \* Continue with fall electrofishing surveys (started 2011)
  - \* Black crappie CPUE = 7
  - \* Bluegill/pumpkinseed CPUE = 24
  - \* Smallmouth bass CPUE = 22
  - \* Walleye CPUE = 72
  - \* Yellow perch CPUE = 5
- \* Continue with spring and fall fyke net surveys (started 2011)
  - \* Fall survey
    - \* 8 fyke nets - 50' lead, 3' x 6' frame, ½" mesh, 24-hour soak
      - \* 397 bluegill/pumpkinseed
      - \* Primarily young-of-year

# Acknowledgements

- \* John Thiel - Dairyland Power Cooperative
- \* Mike Zimmer - Rusk County Land and Water Conservation Department
- \* Paula Carow - Rusk County Land and Water Conservation Department (retired)
- \* Flambeau Lake Association
- \* Flambeau Bassmasters
- \* Muskies Inc.

