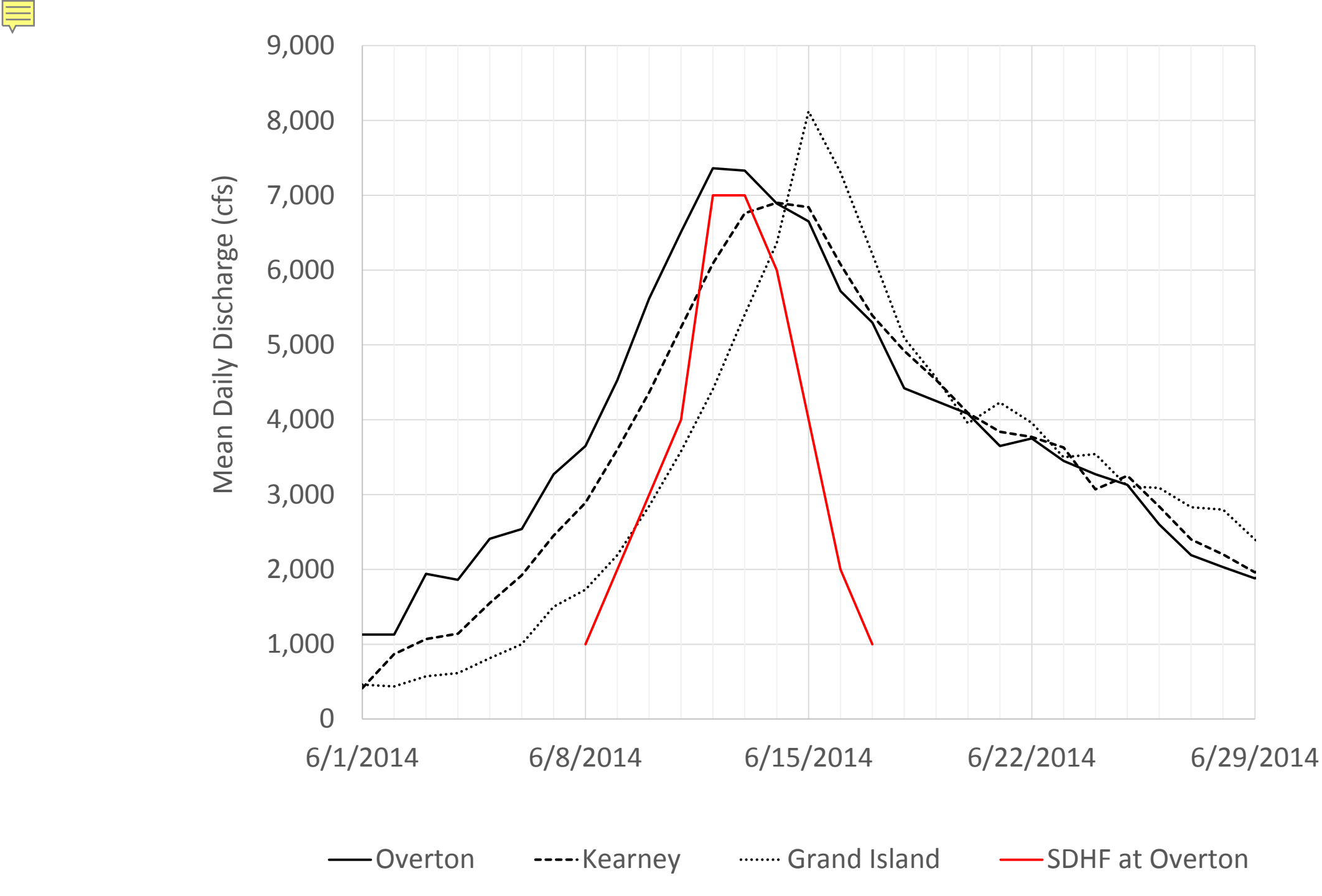
SDHF Performance Memo

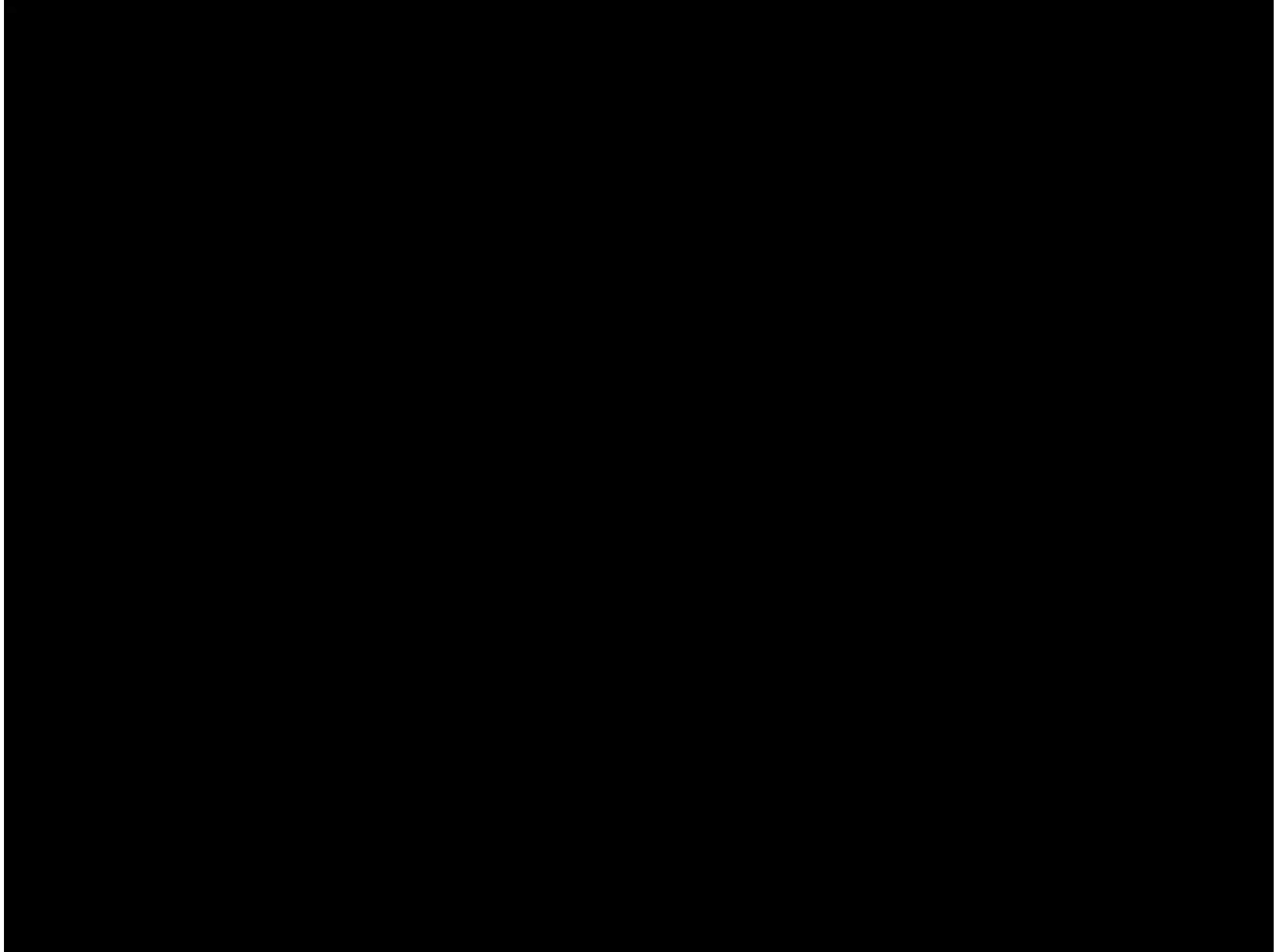
Short-Duration High Flow Memo

- SDHF
  - 5,000 cfs – 8,000 cfs for three days
  - 40,000 – 80,000 ac-ft
  - 38% of water in wet years, 76% normal, 100% dry
- Basis: Regime Theory
  - Assumed $Q_{1.5}$ = Bank-full discharge
  - No field verification
  - No incorporation of peak duration / volume
- Unobstructed Channel Width Analysis
  - Modeled 10 SDHF releases 1998 – 2015
  - Maximum UOCW increase = 12 ft
  - Will not create highly-suitable UOCW for whooping cranes

Comparison of mean observed and predicted unobstructed channel width (UOCW) in the AHR for the period of 2007-2015.

Year	Observed UOCW (ft)	Predicted UOCW (ft)	Error (ft)	Absolute Error (ft)	Error as % of Observed
2007	300	386	86	86	29%
2008	443	450	7	7	2%
2009	373	342	-31	31	8%
2010	409	429	20	20	5%
2011	481	455	-26	26	5%
2012	454	378	-76	76	17%
2013	483	437	-47	47	10%
2014	**431**	**423**	**-9**	**9**	**2%**
2015	625	564	-60	60	10%
MEAN	444	429	-15	40	10%


9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
Mean Daily Discharge (cfs)
6/1/2014
6/8/2014
6/15/2014
6/22/2014
6/29/2014
Overton
Kearney
Grand Island
SDHF at Overton




Disking: $68,000
Phrag Control: $100,000

How will SDHF perform?

DRY YEAR ASSESSMENT

- Use ~100% of Manageable Program water
- Water Cost: ~$9 M
- Maximum UOCW increase of ~12 ft (380 – 400 ft)
- No reduction in phragmites spraying effort
- Reduce disking effort by ~5%
- Disking savings for PRRIP: ~$4,500
- Disking saving for AHR: ~$13,500

Why the disparity?

EXISTING CHANNEL-FORMING DISCHARGE			
Method	***Discharge*** (cfs)	***Volume*** (KAF)	***Return Interval*** (years)
Natural Bank-full	7,000 - 8,000	200 - 260	2.4 - 3.0
Effective Discharge	1,500 - 2,000		N/A
Geomorphic Change	16,000	1,000	16.0

Mechanical Costs Memo

Costs

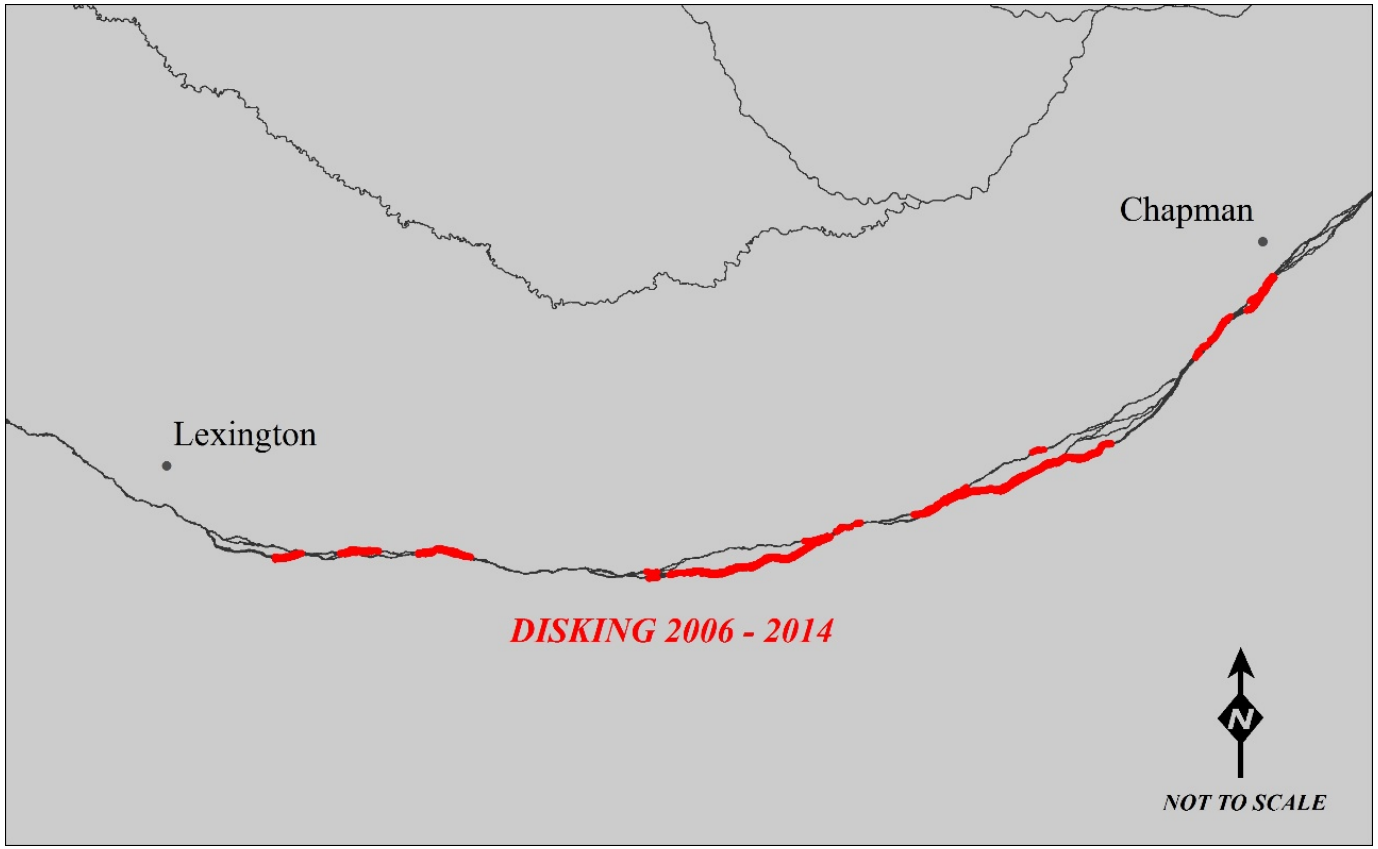
- Phragmites Control (Lake Mac - Columbus)
  - $400,000
  - PRRIP typically contributes $200,000
- Channel Disking
  - Program lands = $90,000
  - Associated Habitat Reach = $270,000
- Coordination and Funding
  - Coordination framework largely inactive or unfunded
  - High potential for phragmites control funding shortfall
  - Future contributions towards disking unknown

If mechanical control lapses…

- Phragmites control
  - Reinfestation within two to five years
  - Loss of channel conveyance capacity
  - Loss of suitable whooping crane habitat

If mechanical control lapses…

- Channel disking
  - Minimal consequences during wet periods
  - Channel narrowing and loss of suitable whooping crane roosting habitat during normal to dry periods



Future Costs

Minimum = $400,000 for phrag control and $90,00 for disking on Program lands

Comprehensive = $750,000 (includes coordination)

Extension cost for comprehensive = $7.5 M

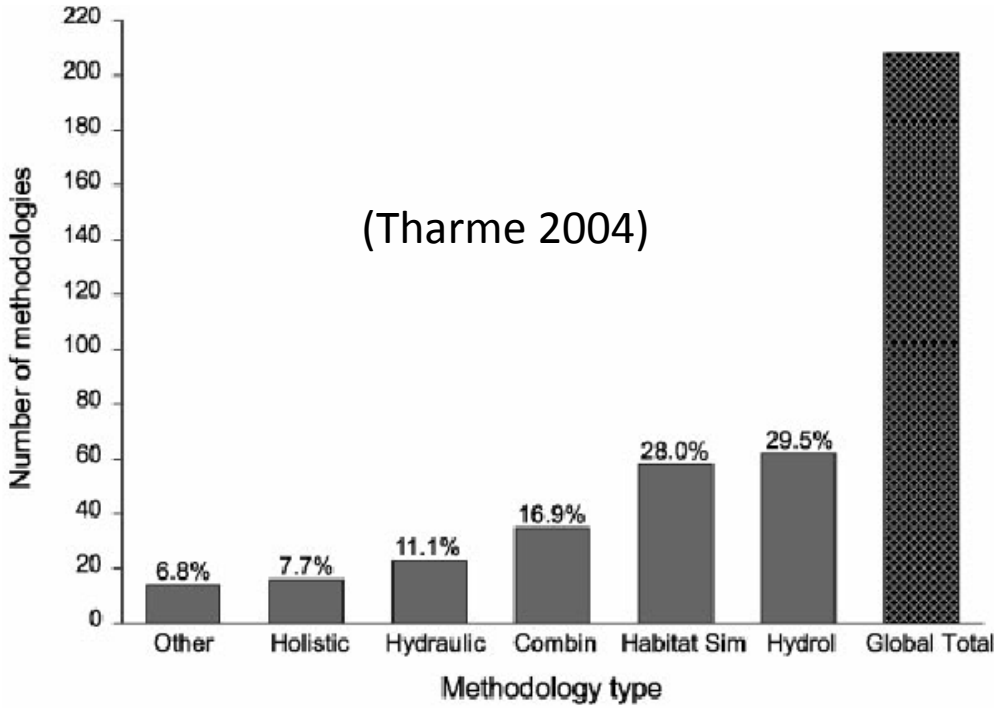
20-year conservation endowment = $12.7 M

50-year conservation endowment = $26.7 M

Species Target Flow Memo

Species Target Flow Background

- Developed during 1994 workshop
- Expert testimony and best available technical resources (no comprehensive methodology)
- Largely unconstrained habitat availability optimization
- Temporally rigid



(Tharme 2004)

Fish-Related Flows

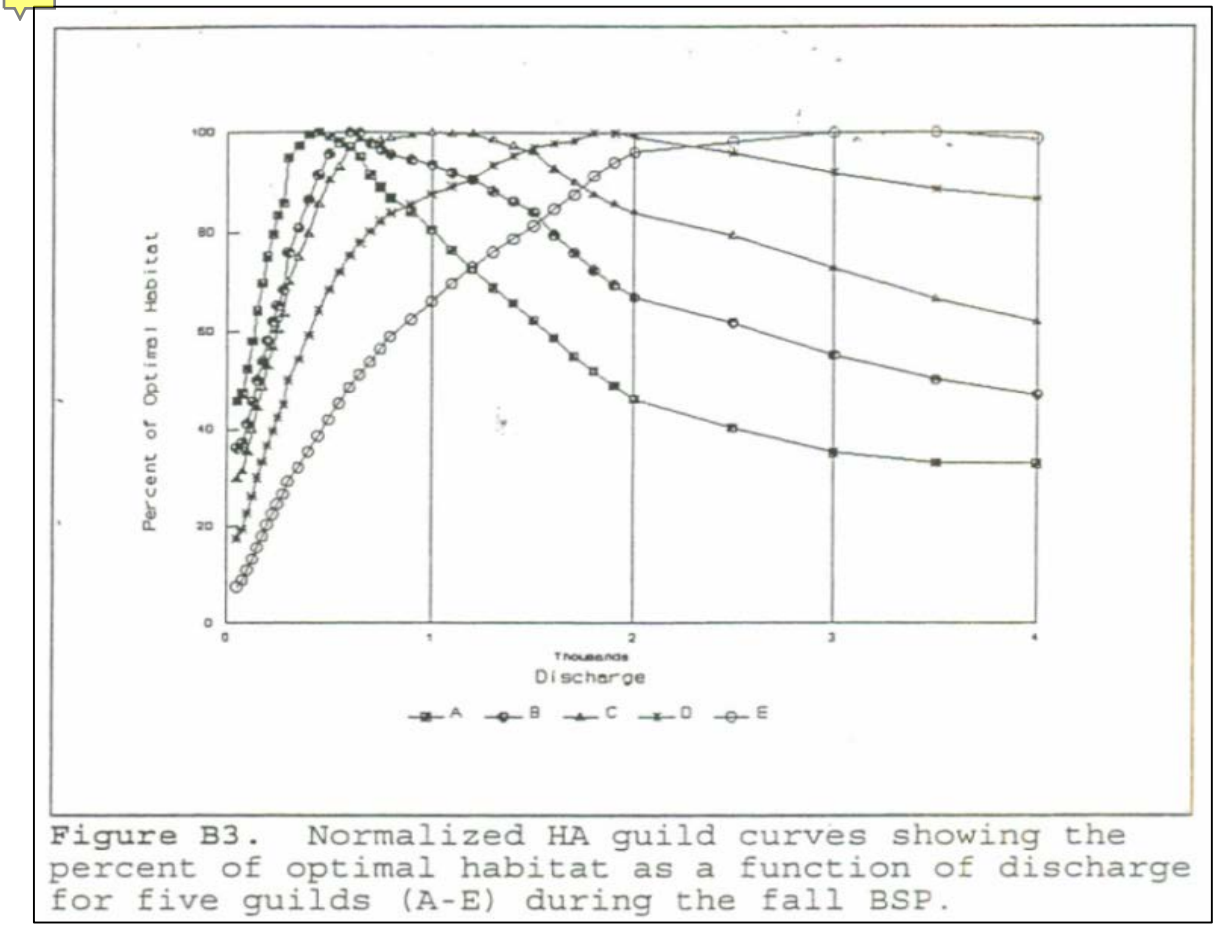
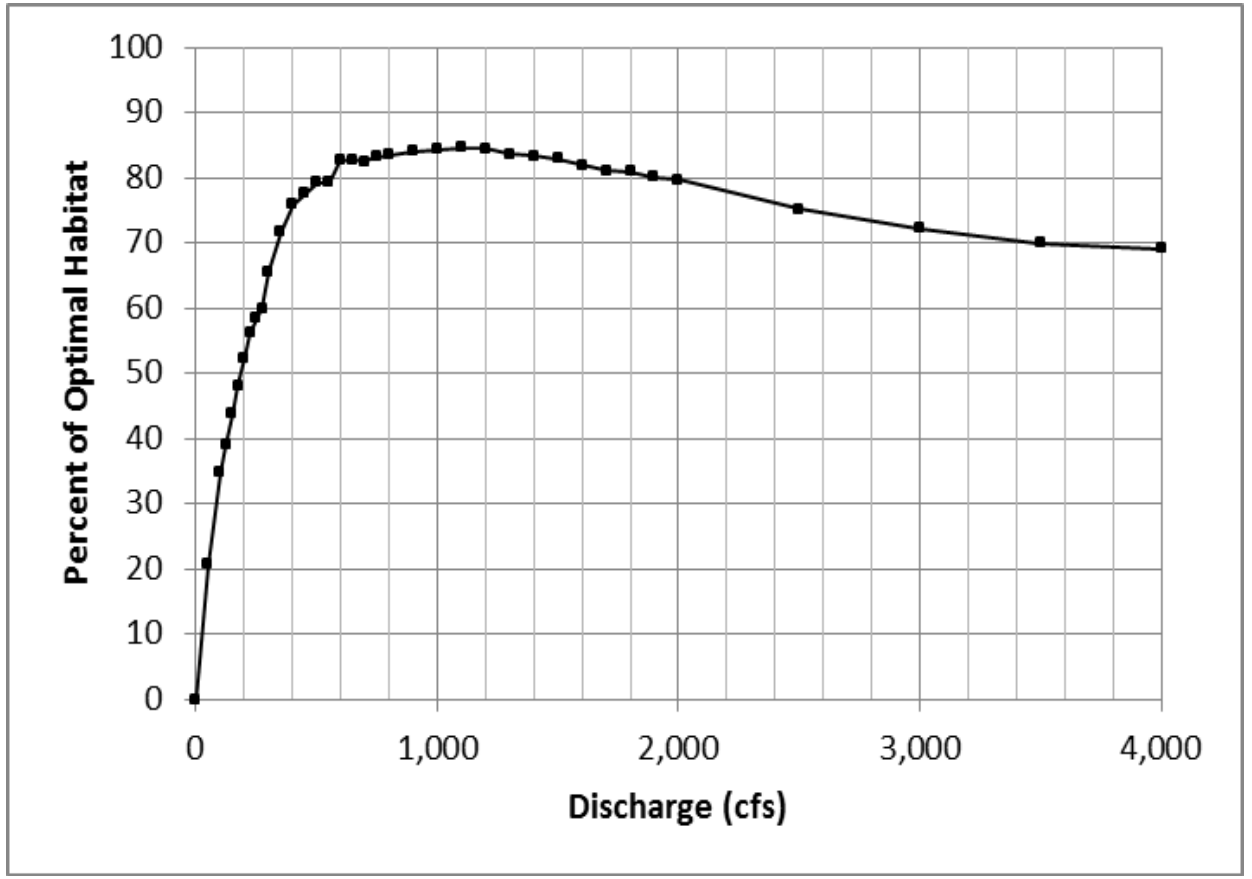


Figure B3. Normalized HA guild curves showing the percent of optimal habitat as a function of discharge for five guilds (A-E) during the fall BSP.

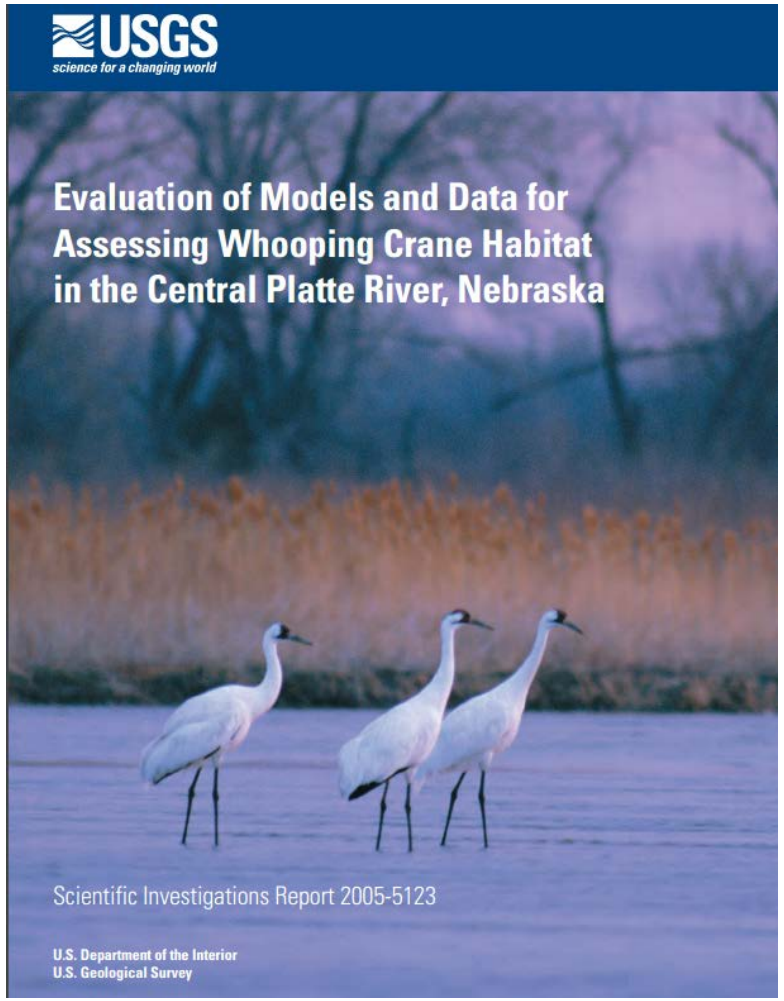
Target Flow Analysis Fish Guild Habitat Area Curves

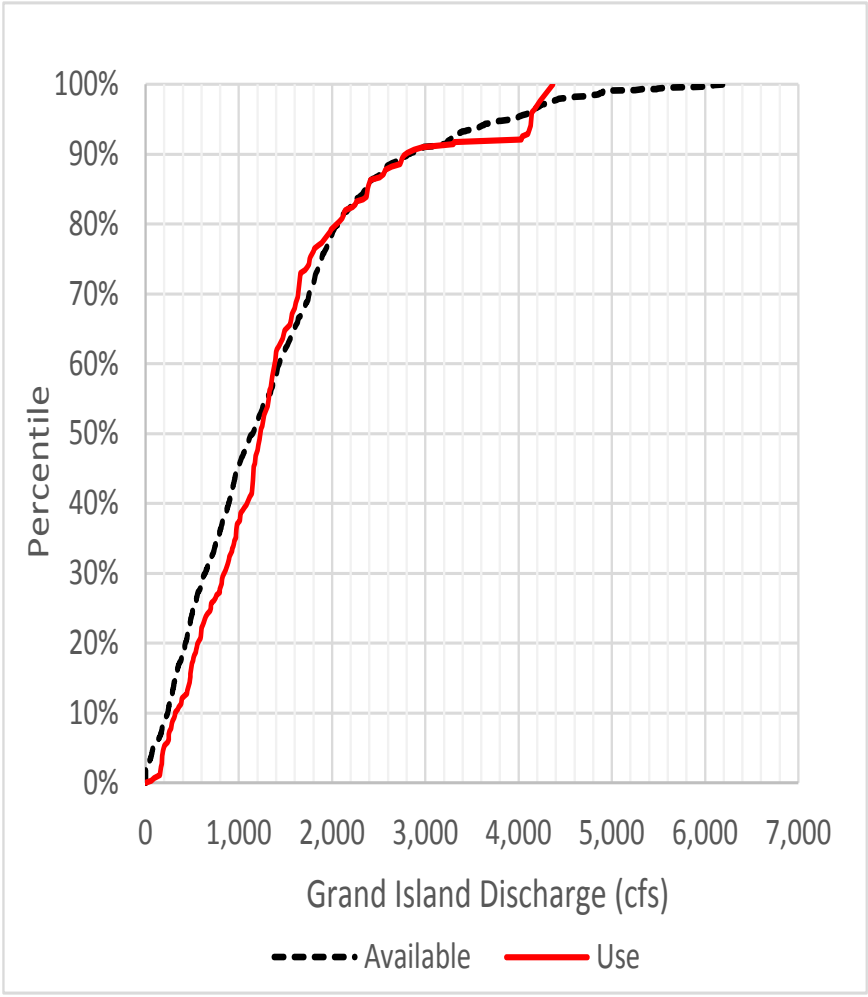


Averaged Habitat Area curve for all guilds showing the percent of optimal habitat as a function of discharge.

Tern and Plover Flows

Whooping Crane Flows





Species Target Flow Deficits

Hydrologic Year Type	USFWS Species Target Flow Deficits (acre-ft)	Forage Fish (600 cfs) and Whooping Crane (1,350 cfs) Optimized Deficits (acre-ft)
WET	180,000	22,000
NORMAL	370,000	100,000
DRY	330,000	240,000

Species Flows in Relation to Physical Process Target Flows…