

CRP and Duck Production in the Prairie Pothole Region

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Division of Migratory Bird Management Traditional Breeding Waterfowl Survey Units Population Data for 1994-2002

The US PPR
attracted 3X the
Density of
Breeding Duck
Pairs compared
to the PPR of
Canada

7% of the Area and
21% of the Duck Pairs



LIMITING FACTORS (Births)

- **SYSTEM-WIDE DECLINE IN PUDDLE DUCK NEST SUCCESS IN PPR (FROM 30-35% in 1930s TO 8-15% in 1980's) (Beauchamp et al. 1996, Klett et al. 1988).**
- **NEST FAILURE DUE PRIMARILY TO DEPREDATION ASSOCIATED WITH CHANGES IN LANDUSE.**

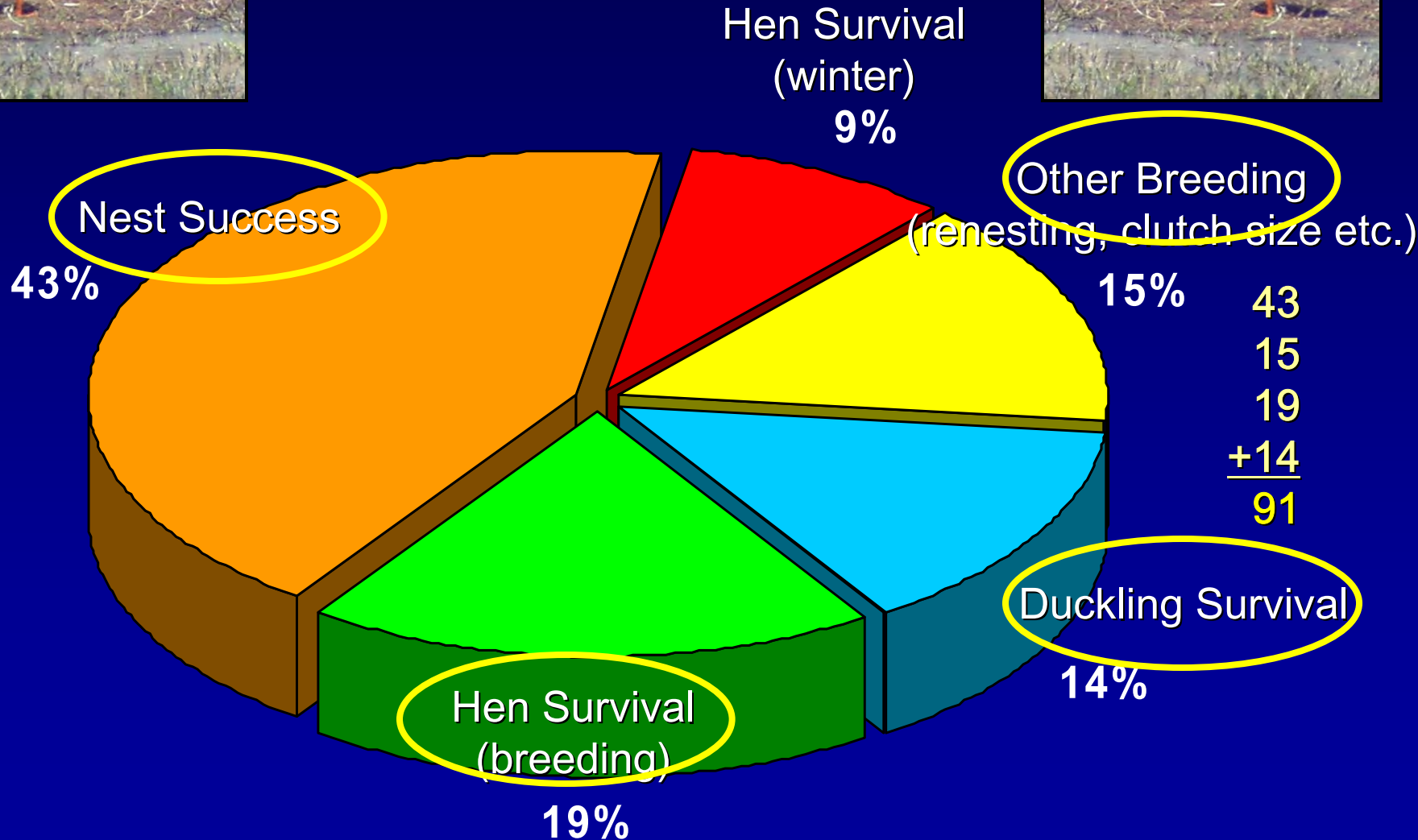
LIMITING FACTORS (Deaths)



Factors Influencing Change in Population Size of Mid-Continent Mallards

(Hoekman et al.)

(Journal of Wildlife Management 2002)



**USDA Conservation Reserve Program Resulted
in Over 4.5 Million Acres of Cropland Being
Converted To Perennial Grass Cover in the
PPR of the Dakotas and northeast Montana**



CRITERIA FOR SUCCESSFUL NESTING COVER PROGRAMS

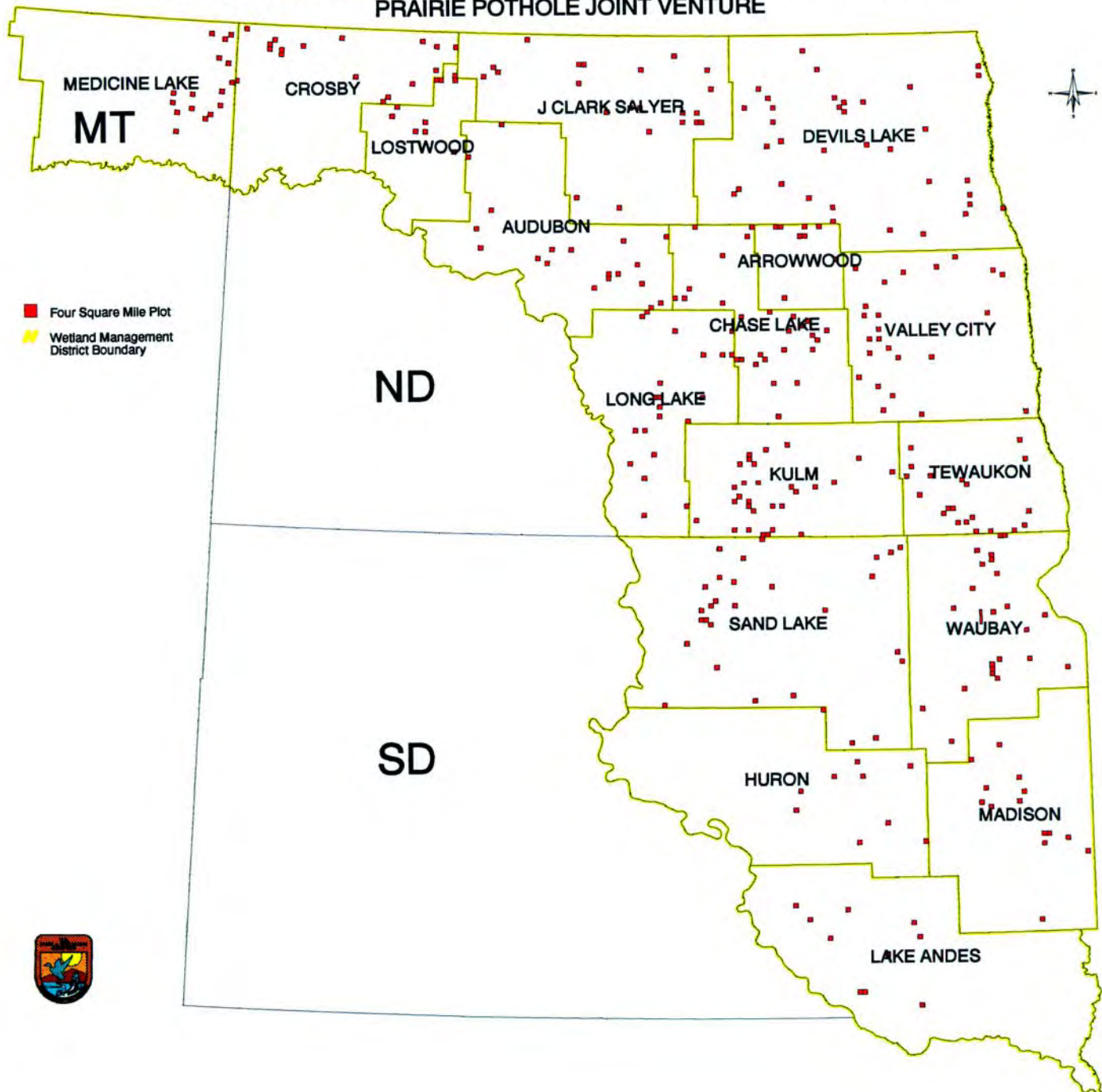
- **CHARACTERIZED BY NEST SUCCESS HIGHER THAN OTHER MAJOR COVER TYPES**
- **MORE ATTRACTIVE TO NESTING HENS THAN COMPETING COVER**
- **DISTRIBUTED TO BE ACCESSIBLE BY A LARGE PORTION OF NESTING HENS.**

From 1992-1997 the R6 HAPET Office Lead a Study of the Impact CRP on Duck Production in the PPR

(mallard, gadwall, blue-winged teal, n.shoveler, n. pintail)

**Cooperators--USGS Northern Prairie Wildlife
Research Center, Ducks Unlimited, Central Flyway,
Mississippi Flyway, Bureau of Reclamation, North
Dakota Game and Fish Department, South Dakota
Game Fish and Parks, Prairie Pothole Joint Venture,
Wildlife Management Institute.**

FOUR SQUARE MILE PLOTS IN THE USFWS REGION 6 PORTION OF THE PRAIRIE POTHOLE JOINT VENTURE



DURING 1992-95

- **SEARCHED OVER 30,000 ACRES OF CRP**
- **STUDIED 10,700 DUCK NESTS**
- **APPLIED OUR RESULTS TO PEAK CRP PERIOD (1992-1997).**



RESULTS

- **NEST SUCCESS IN CRP (= 23%) WAS HIGHER THAN ANY OTHER MAJOR NEST COVER TYPE.**
- **CRP WAS THE MOST PREFERRED COVER TYPE ON THE LANDSCAPE BY NESTING HENS.**
- **DUE TO THE MAGNITUDE AND DISTRIBUTION OF CRP, IT WAS AVAILABLE TO A LARGE PORTION OF NESTING HENS (30% OF HATCHED NESTS IN THE PPR WERE IN CRP)**

RESULTS

- **OVERALL NEST SUCCESS IN ALL COVER TYPES WAS HIGHER DURING THE CRP PERIOD VS. PRE-CRP PERIOD**
- **NEST SUCCESS IN CRP WAS POSITIVELY RELATED TO THE PERCENT OF TOTAL GRASS COVER ON THE LANDSCAPE**

UTM North.= 52.00

East. = 4.75

(x 10-5)

DSR

0.97

0.96

0.95

0.94

0.93

SHOV.

BWT

GAD.

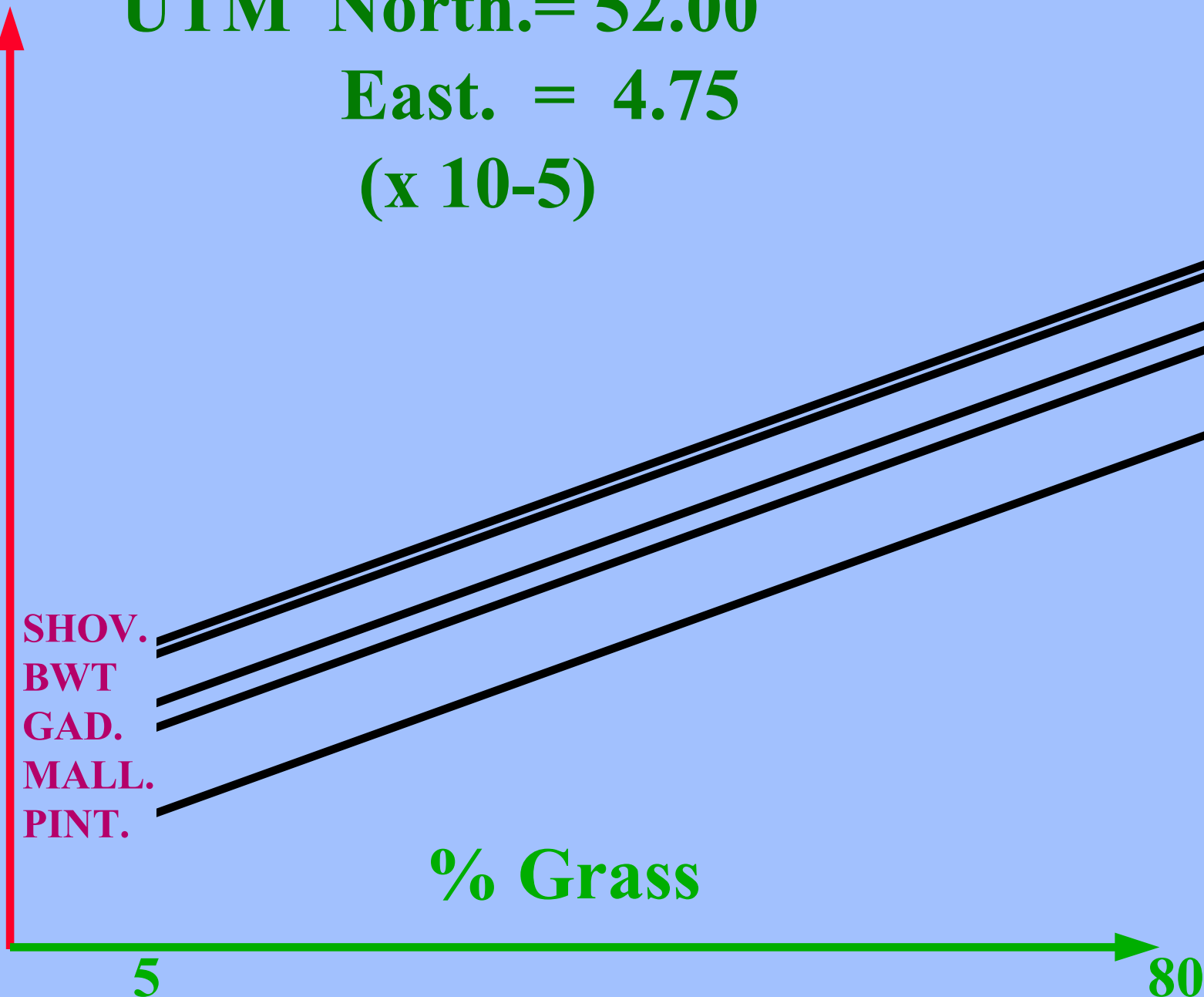
MALL.

PINT.

% Grass

5

80





BOTTOM LINE (PEAK CRP 1992-97)

- **ESTIMATED 12.4 MILLION (2.1 MILLION/YEAR) ADDITIONAL DUCKS FLEDGED WITH CRP ON LANDSCAPE**
- **30% INCREASE IN PRODUCTION, COMPARED TO EXPECTED W/O CRP ON LANDSCAPE**

1998-2000?

- CAN 1992-97 RESULTS BE EXTRAPOLATED TO 1998-03 (AND BEYOND) POPULATIONS?

- YES, IF?

- 1. CURRENT SPATIAL DISTRIBUTION OF CRP CAN BE MADE AVAILABLE.
- 2. ASSUME NEST SUCCESS HAS NOT CHANGED.
- 3. SIZE/DISTRIBUTION OF BREEDING DUCKS CAN BE DETERMINED.



EXTRAPOLATED TO 1998-2002 (With Caution)

- **ESTIMATED 12.4 MILLION (2.5 MILLION/YEAR) ADDITIONAL DUCKS FLEDGED WITH CRP ON LANDSCAPE**
- **31% INCREASE IN PRODUCTION, COMPARED TO EXPECTED W/O CRP ON LANDSCAPE**



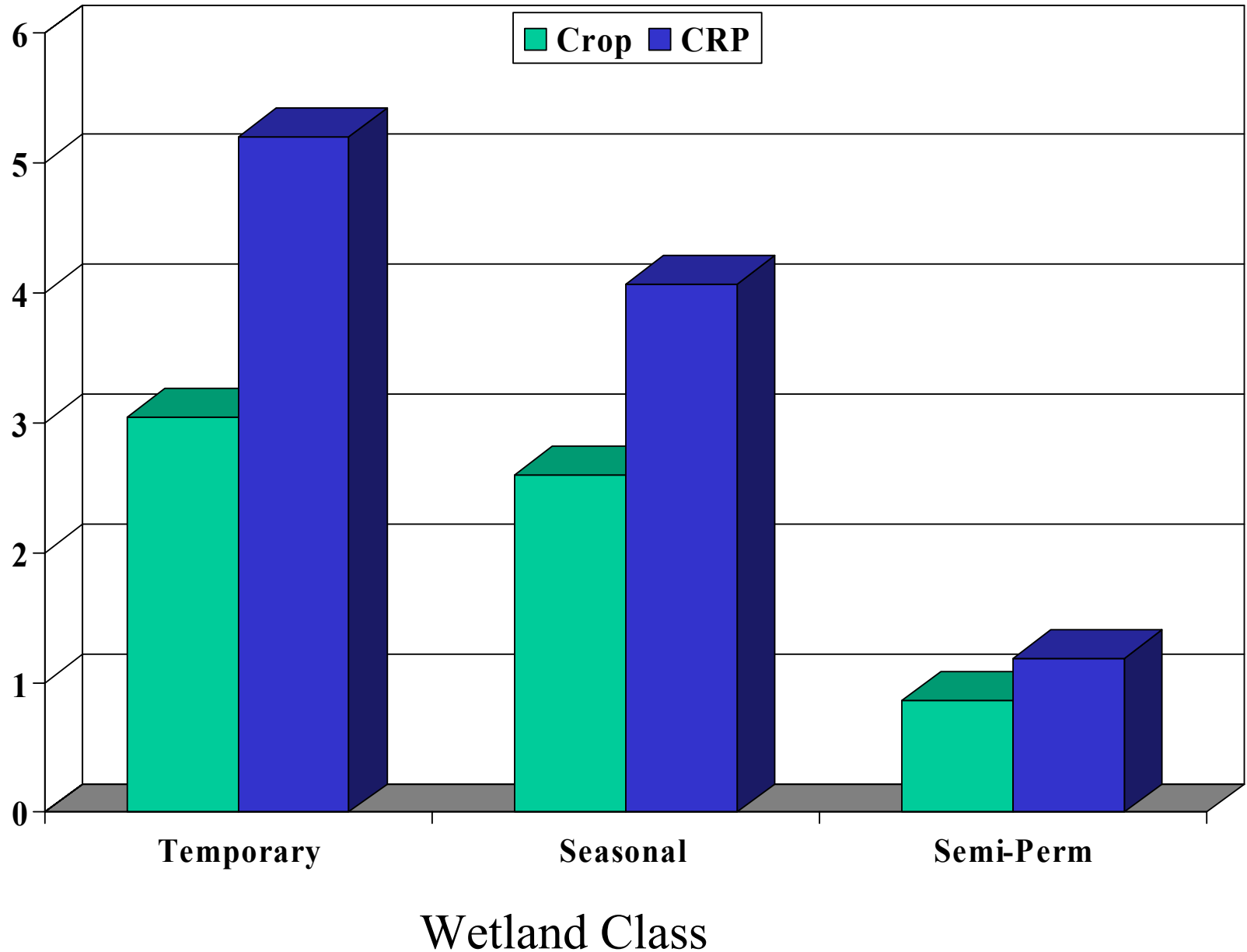
OVERALL 1992-2002

- **ESTIMATED 24.8 MILLION
ADDITIONAL DUCKS FLEDGED
WITH CRP ON LANDSCAPE.**

**Annually Count Pairs
on 2,860 Wetlands of
Known Size and Class, and
Upland Habitat Association**



Duck Pairs/Wet Acre (13 Species Combined) On Wetlands Occurring in Crop Fields Vs. CRP Fields during Spring 2000-2003

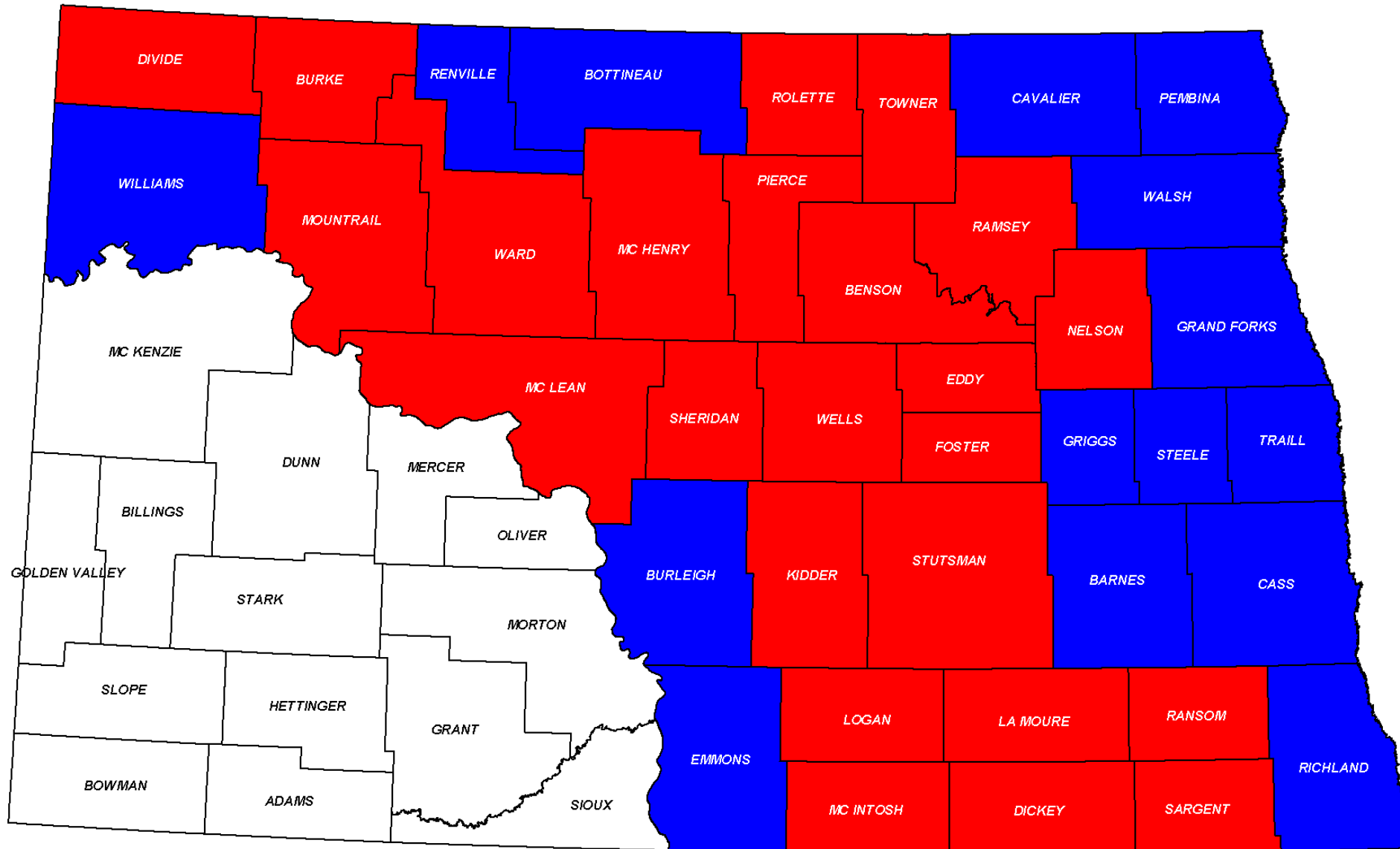


Identifying Waterfowl Nesting Priority Areas

Duck Pairs
Per Square Mile



Changes in CRP Acreage Relative to Duck Density



**COUNTIES WITH HIGH DUCK
POPULATIONS=11% INCR. IN CRP**



**COUNTIES WITH LOW DUCK
POPULATIONS=78% INCR. IN CRP**

CHANGES IN EBI AFTER 15TH SIGNUP THAT HAVE A NEGATIVE IMPACT ON CRP ENROLLMENT IN THE PRAIRIE POTHOLE REGION

- PROXIMITY TO WETLANDS
- PROXIMITY TO PROTECTED AREAS
- UPLAND TO WETLAND RATIO
- WATER QUALITY AREA
- PPR AS A CONSRVATION PRIORITY AREA.

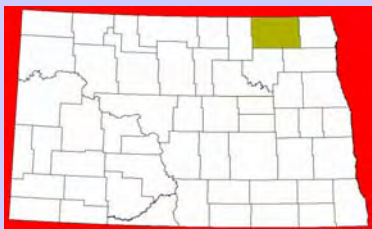




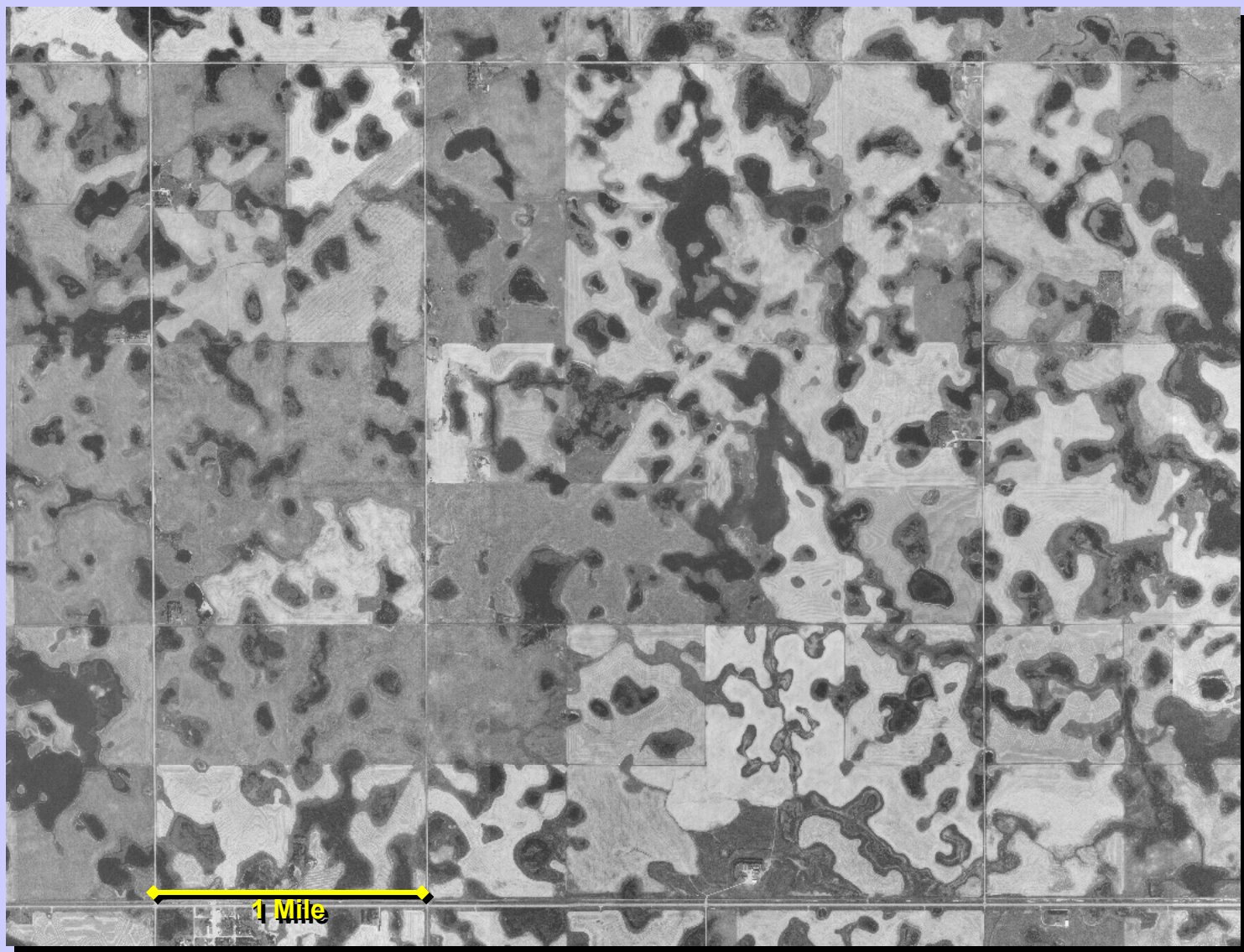
Wetland Resources



North Dakota



Cavalier County



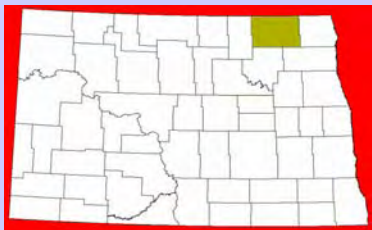
Area With Mostly Intact Wetlands



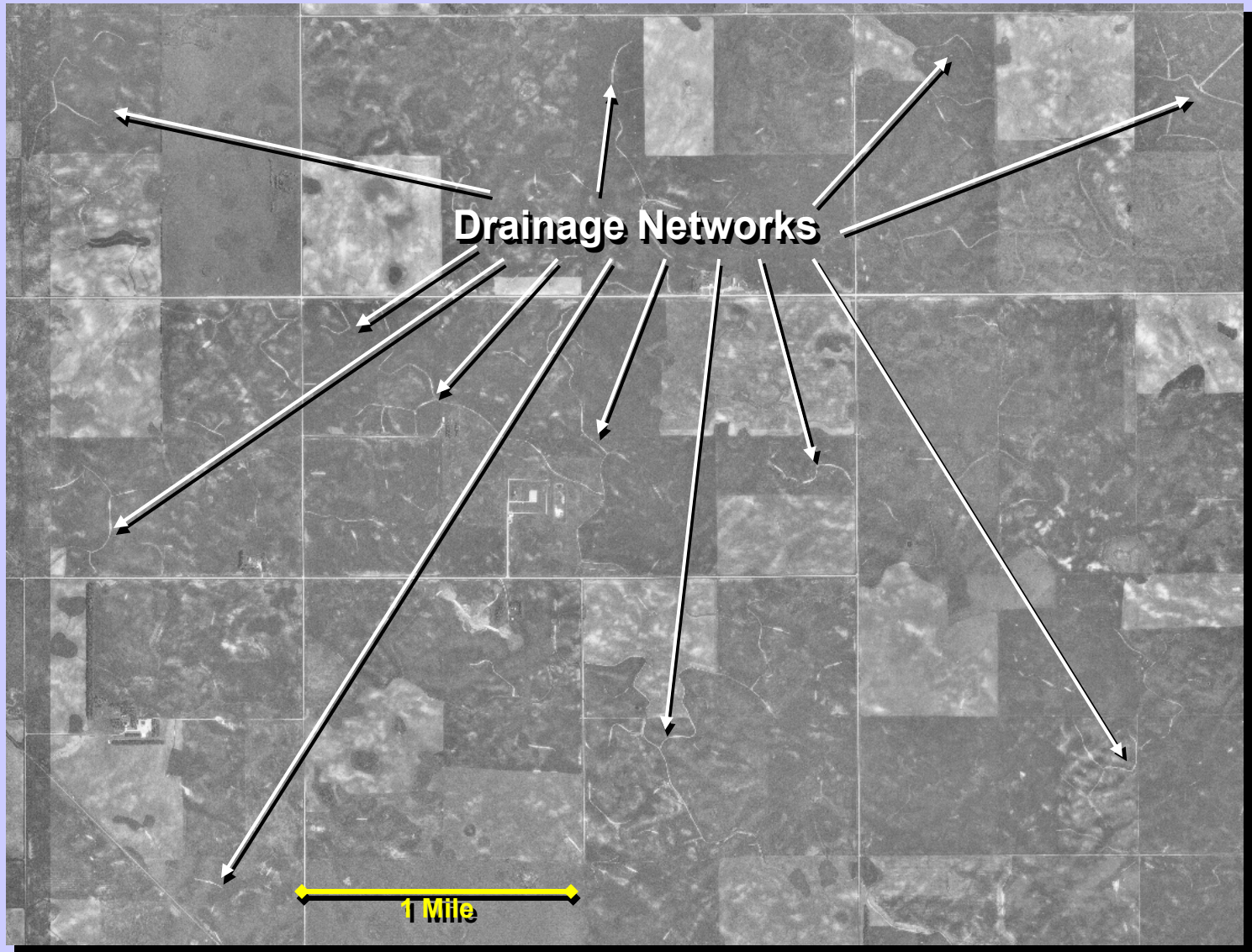
Total Loss of The Wetland Resource



North Dakota



Cavalier County



Area 6.5 Miles South Where Most Wetlands Have Been Completely Drained



Annually Count Pairs on 2,860 Wetlands of Known Size and Class, and Upland Habitat Association



**HAPET and NPWRC Developed Pair-Wetland
Regression Models -- Predictive Variables
Include Wetland Class, Size, and Geographic
Location**

Mallard Pair/Wetland Regression Model (Temporary Basin Class)

Pairs =

$$\frac{-(0.304 * A) + (35.492 * A) - (0.052 * \sqrt{A * X1000}) - (0.006 * \sqrt{A * Y1000}) + (0.000009 * \sqrt{A * X1000 * Y1000})}{1}$$

Where: A = Area of pond (pt_i), calculated as basin size * {e [b₀ + b₁*log(x) + b₂*log(y) + b₃*log(x)*log(y) + b₄*log (acres)]} - 0.5 + Est{z₁}

and The mean square root of A (pt_i), calculated as {e [c₀ + c₁*log(x) + c₂*log(y) + c₃*log(x)*log(y) + c₄*log (acres)]} - 0.5 + Est{w₁}

b₀, b₁, b₂, b₃, b₄, c₀, c₁, c₂, c₃, c₄ are regression coefficients

X and Y are Universal Transverse Mercator coordinates



Present Size and Distribution of the Breeding Duck Population

4,249,823 Duck Pairs

(Mallard, Northern Pintail, Gadwall, Blue-winged Teal, Northern Shoveler)



Duck Pairs



**Pairs Remaining if
Small-Shallow Unprotected
Wetlands Were Lost
(38% Decline in Total Pairs)**



Duck Pairs



More Opportunities Than Money

Grassland Easement Opportunity Backlog in North and South Dakota:

- 900 Interested Landowners
- 285,000 Acres

**This 640 Acres of Grassland was
Converted to Cropland while an
Opportunity for Protecting this Area
Waited on a Referral List for
2 Years**

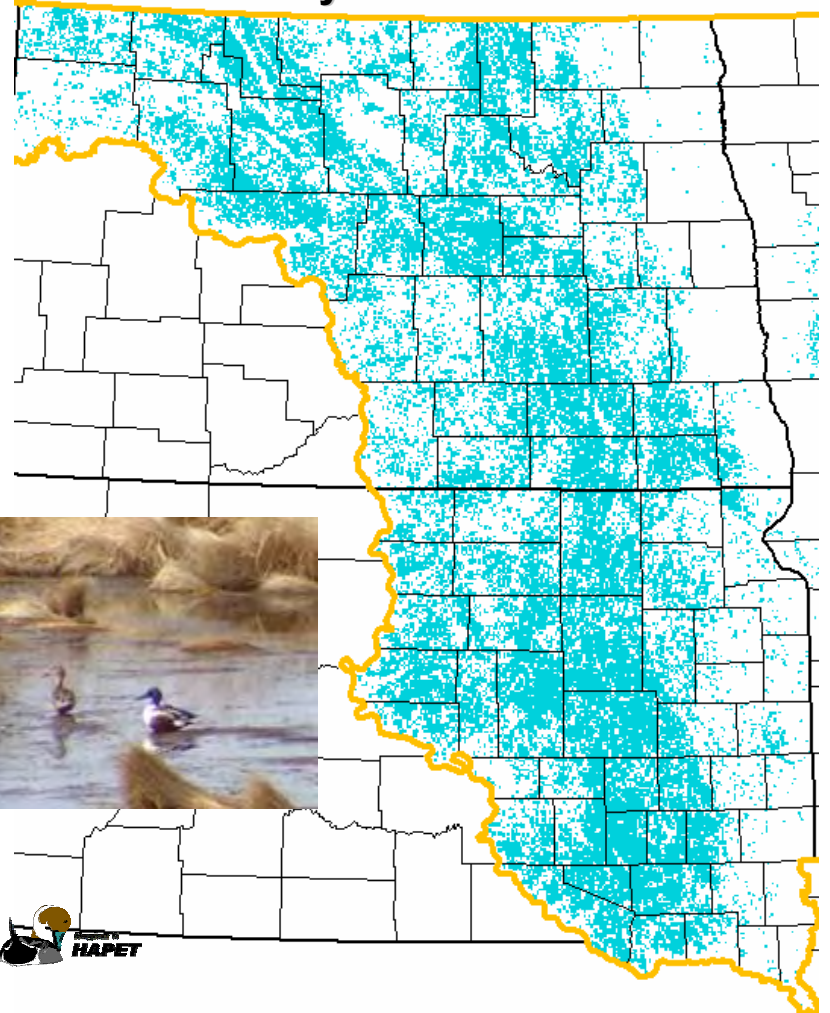
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Wetland Conservation Priority Areas For Wilson's Phalarope, American Bittern, and Black Tern



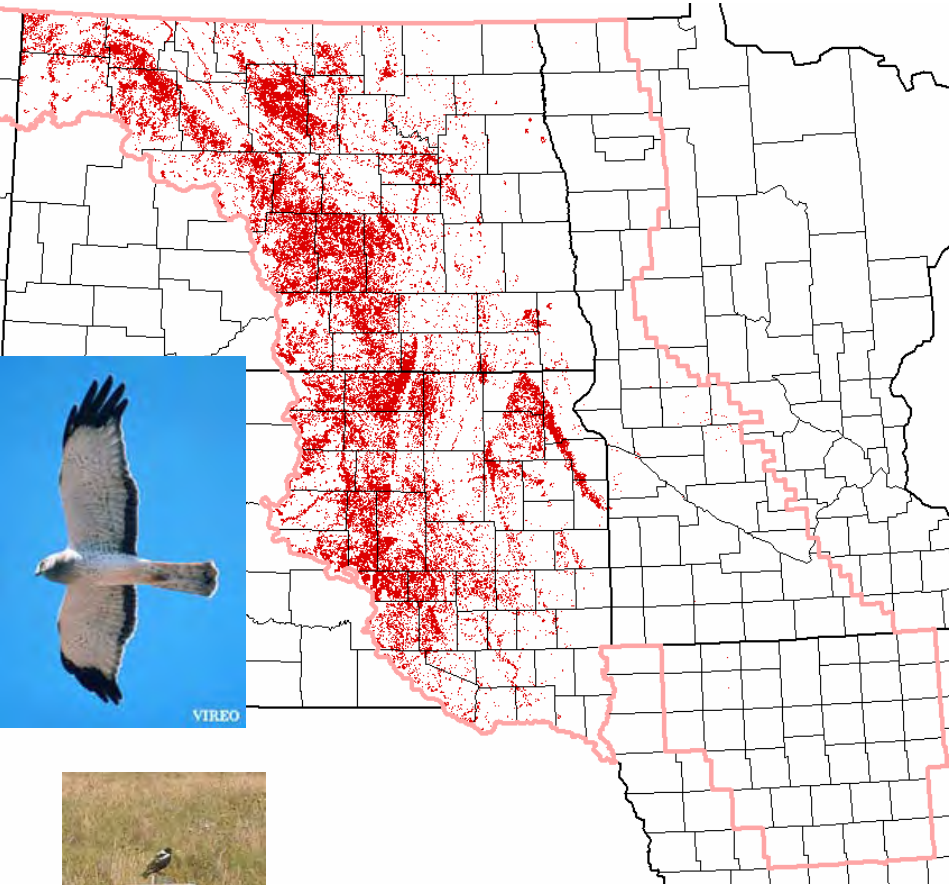
Wetland Conservation Priority Areas For Ducks



Grassland Conservation Priority Areas For Wilson's Phalarope, Northern Harrier, and Bobolink, Grasshopper Sparrow, W. Meadowlark, and Dickcissel



Grassland Conservation Priority Areas For Ducks



VIREO



Conclusions

Major Factors Driving Mid-Continent Waterfowl Populations Occur on the Breeding Grounds

Maintain 5+ Million Acres of CRP in Association with Important Wetlands

Maintain “Swampbuster”

Secure 1,400,000 Additional Wetland Acres

Secure 10,400,000 Additional Grassland Acres

Failure to Act:

Loss of Wetlands And Grasslands Which Provide 6.2 Million Ducks Annually to the Fall Flight (This is Equivalent to ~68% of the Average US Duck* Harvest for 1998-2002)

