CRP and Duck Production in the Prairie Pothole Region

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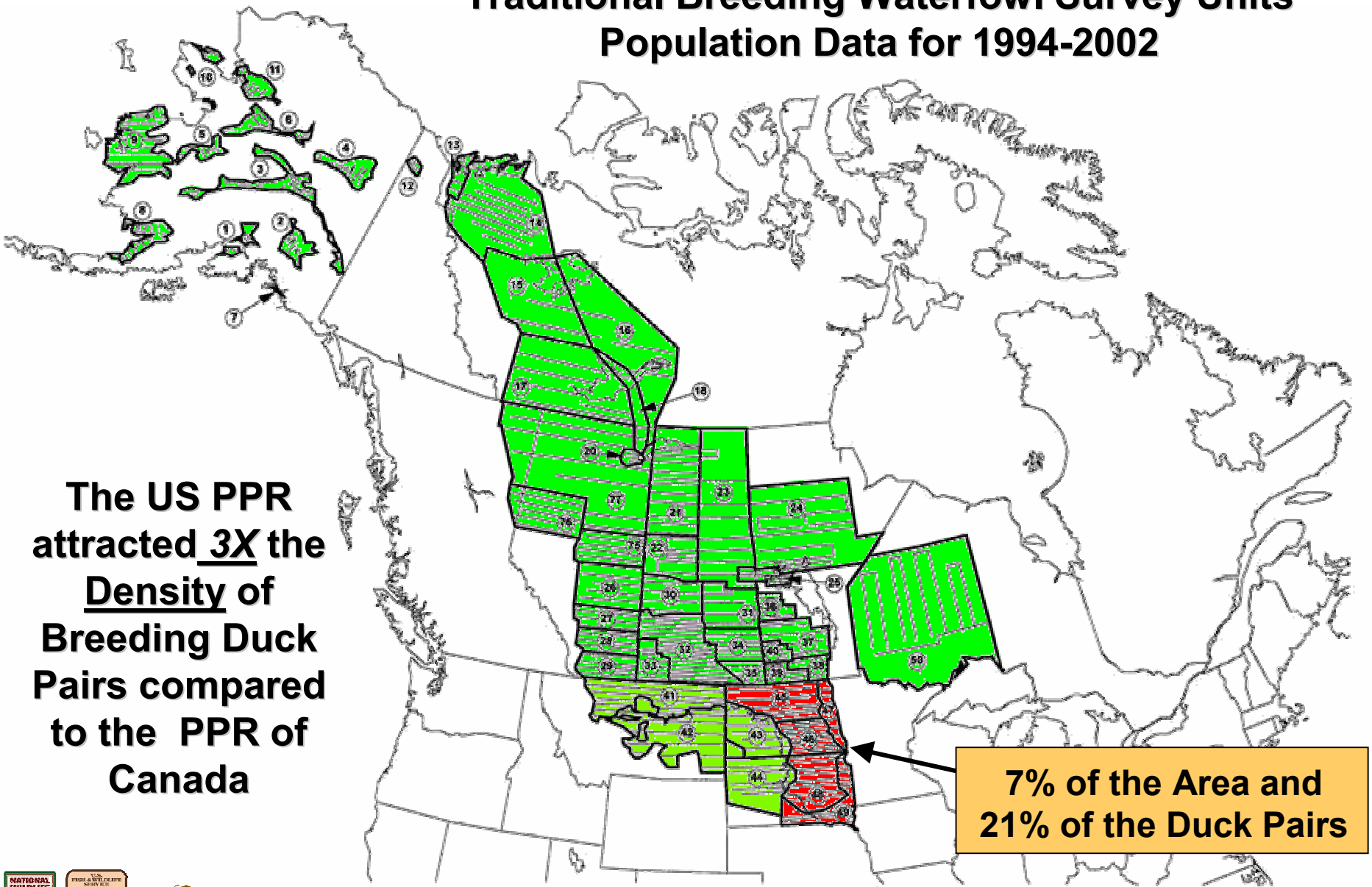
Division of Migratory Bird Management
Traditional Breeding Waterfowl Survey Units
Population Data for 1994-2002



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

LIMITING FACTORS (Births)

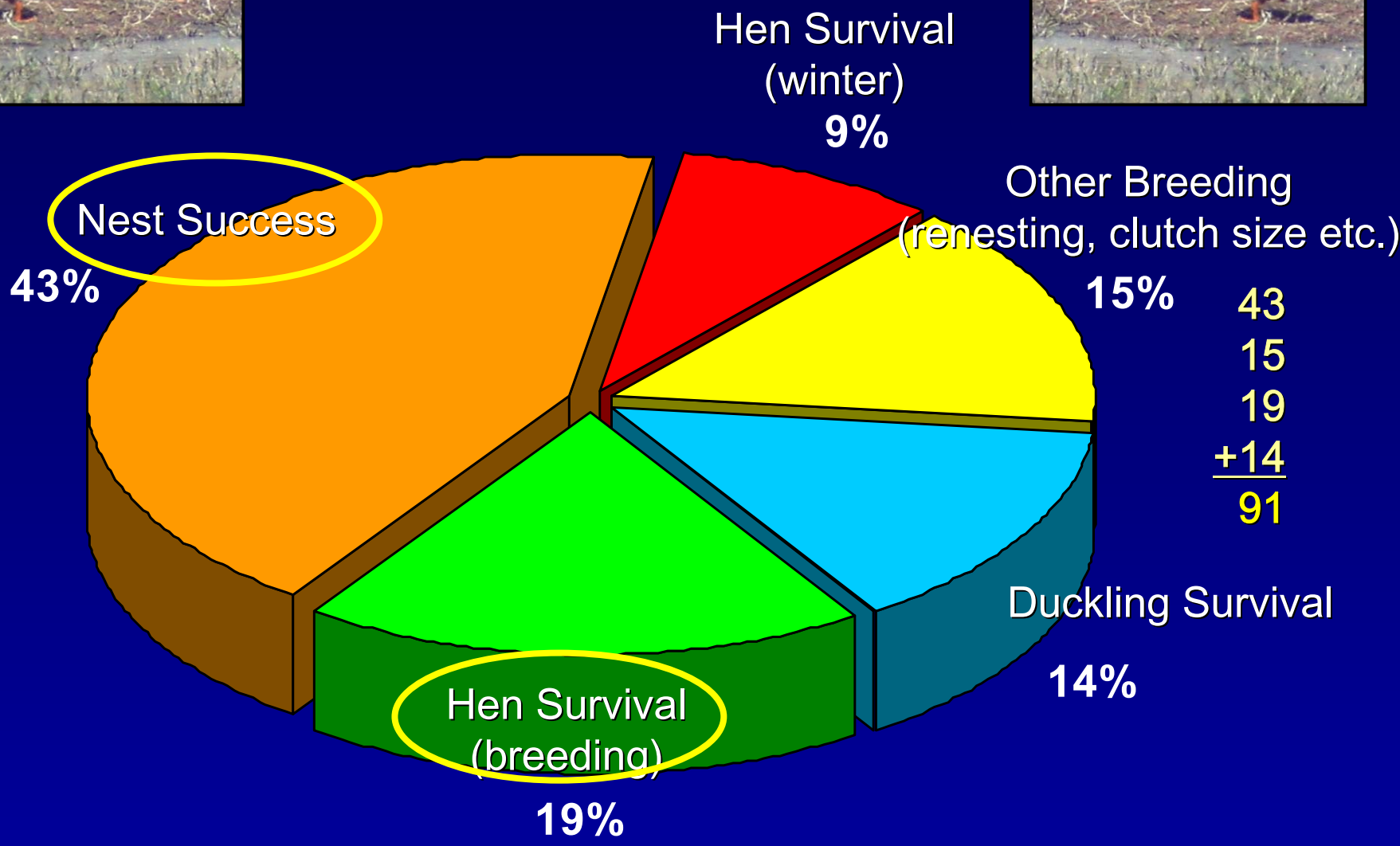
- SYSTEM-WIDE DECLINE IN PUDDLE DUCK NEST SUCCESS IN PPR (FROM 30-35% in 1930s TO 8-15% in 1980's) (Beauchamp et al. 1996, Klett et al. 1988).
- NEST FAILURE DUE PRIMARILY TO DEPREDATION ASSOCIATED WITH CHANGES IN LANDUSE.

LIMITING FACTORS (Deaths)

Factors Influencing Change in Population Size of Mid-Continent Mallards

(Hoekman et al.)

(Journal of Wildlife Management 2002)



43
15
19
+14
91

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

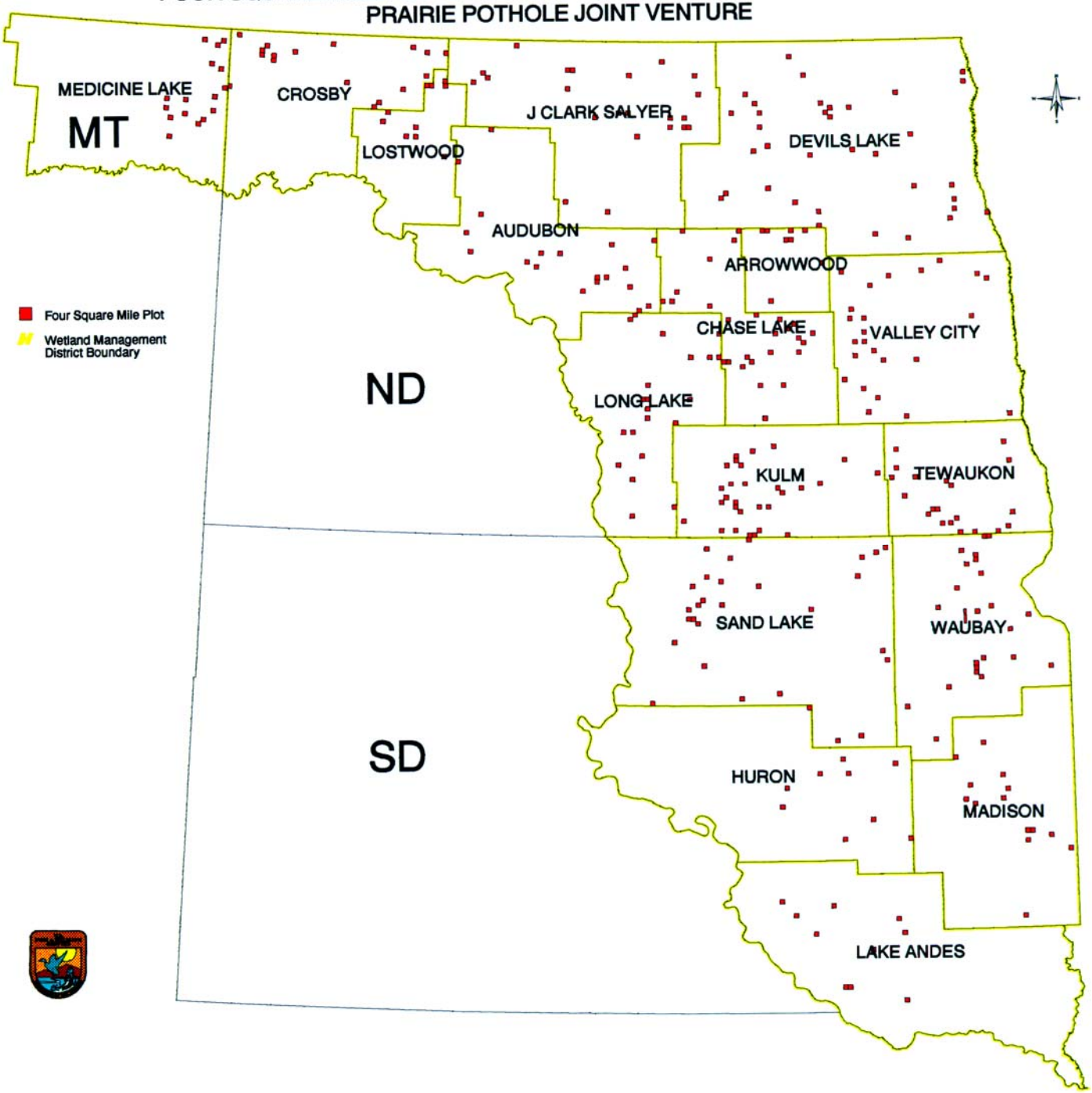
- CHARACTERIZED BY NEST SUCCESS HIGHER THAN OTHER MAJOR COVER TYPES
- MORE ATTRACTIVE TO NESTING HENS THAN COMPETING COVER
- DISTRIBUTED TO BE ACCESSIBLE BY A LARGE PORTION OF NESTING HENS.

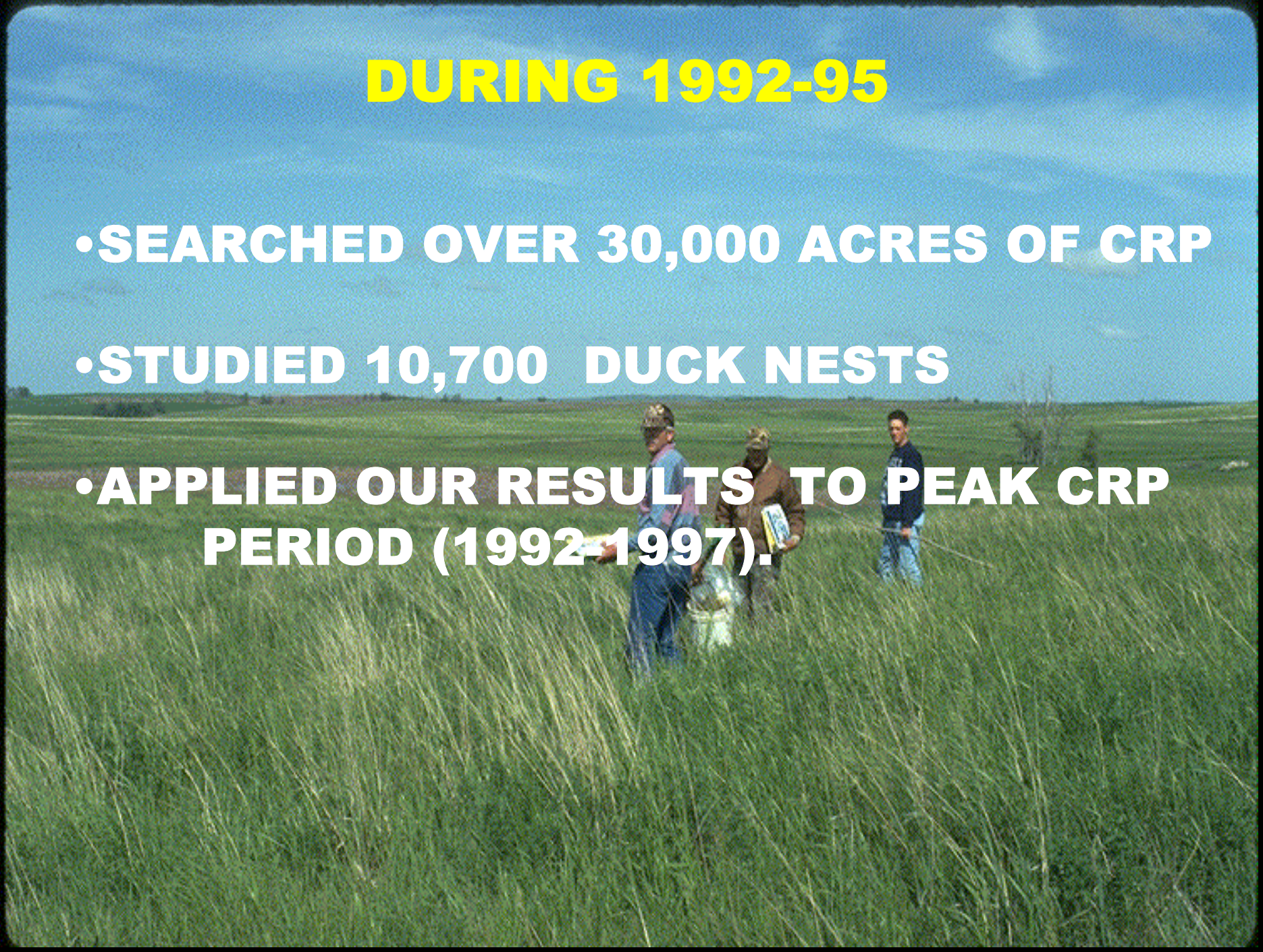
From 1992-1997 the HAPET Office Lead a Study of the Impact CRP on Duck Production in the PPR

(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 ands 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).

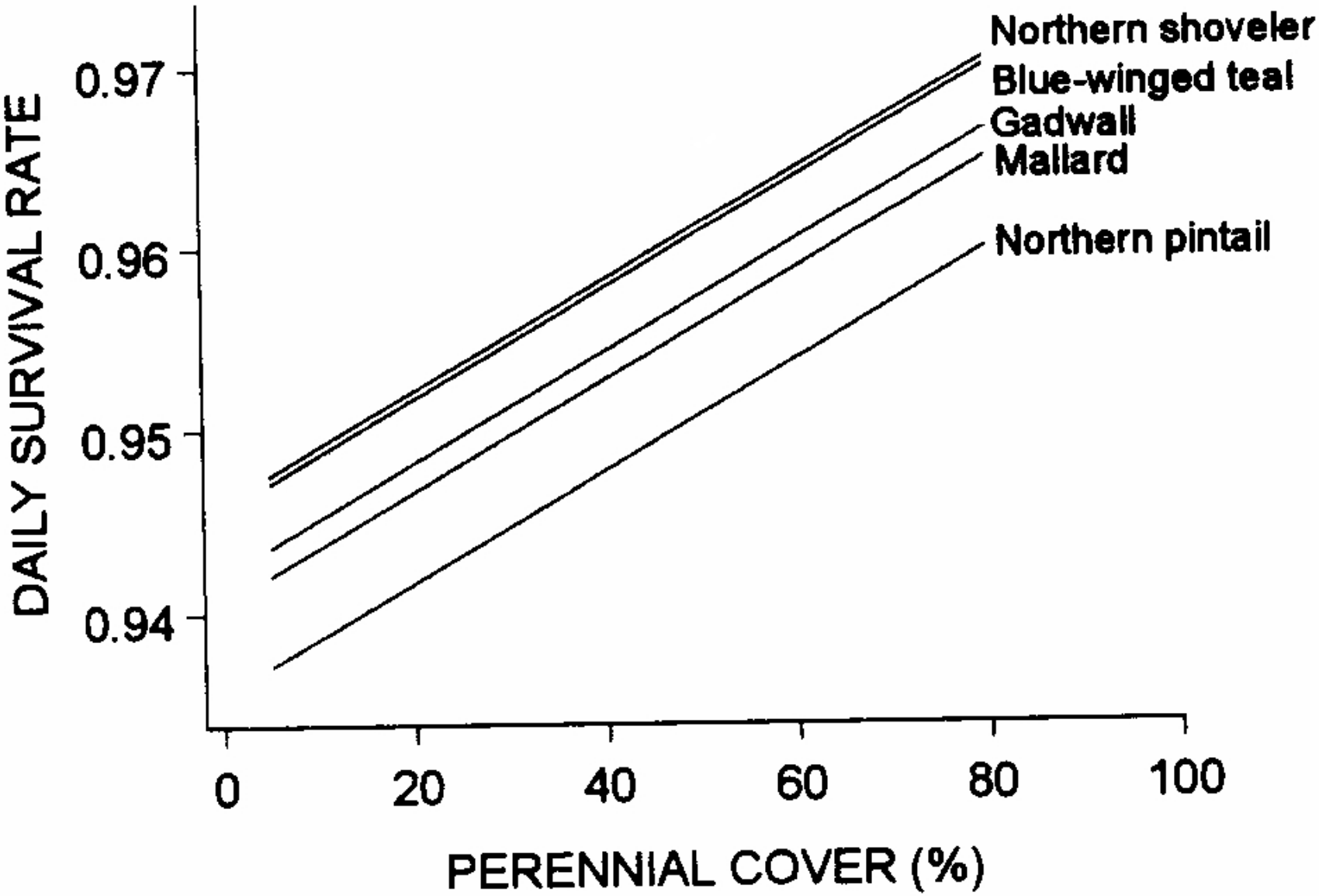
RESULTS

- NEST SUCCESS IN CRP (= 23%) WAS HIGHER THAN ANY OTHER MAJOR NEST COVER TYPE.
- CRP WAS THE MOST PREFERED 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


Northern shoveler
Blue-winged teal
Gadwall
Mallard
Northern pintail
DAILY SURVIVAL RATE
0.97
0.96
0.95
0.94
0
20
40
60
80
100
PERENNIAL COVER (%)

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

1998-200?

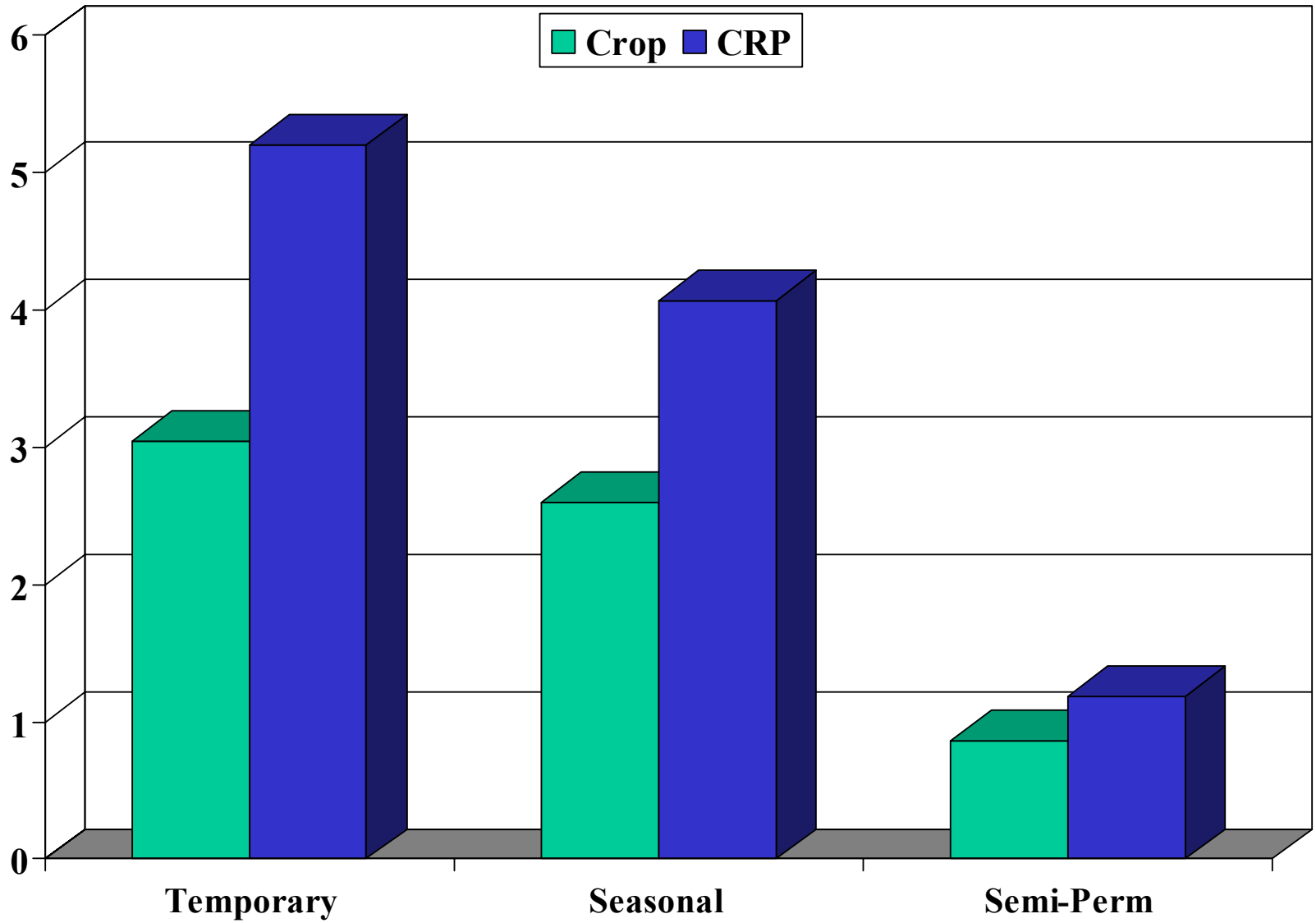
- CAN 1992-97 RESULTS BE EXTRAPOLATED TO 1998-03 (AND BEYOND) POPULATIONS?
- YES, IF?
- 1. CURRENT SPATIAL DISTRIBUTION OF CRP CAN BE MADE AVAILABLE.
- 2. ASSUME NEST SUCCESS HAS NOT CHANGED.
- 3. SIZE/DISTRIBUTION OF BREEDING DUCKS CAN BE DETERMINED.

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

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



Wetland Class

Mallard Pair/Wetland Regression Model (Temporary Basin Class)

Pairs =

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

Where: A = Area of pond (pt_i), calculated as basin size * $\{e^{[b0 + b1*\log(x) + b2*\log(y) + b3*\log(x)*\log(y) + b4*\log(acres)]}\} - 0.5 + Est\{z_1\}$

and The mean square root of A (pt_i), calculated as $\{e^{[c0 + c1*\log(x) + c2*\log(y) + c3*\log(x)*\log(y) + c4*\log(acres)]}\} - 0.5 + Est\{w_1\}$

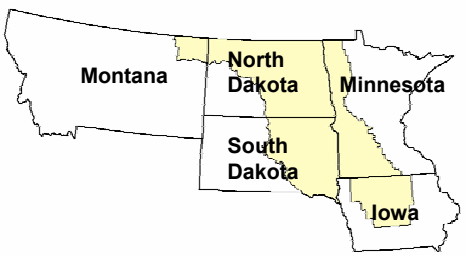
b0, b1, b2, b3, b4, c0, c1, c2, c3, c4 are regression coefficients

X and Y are Universal Transverse Mercator coordinates

Present Size and Distribution of the Breeding Duck Population

4,249,823 Duck Pairs

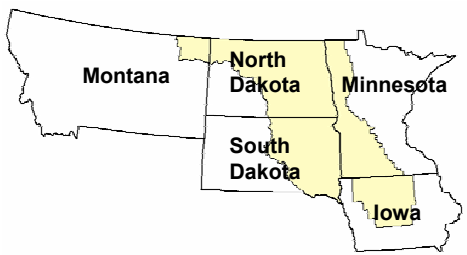
(Mallard, Northern Pintail, Gadwall, Blue-winged Teal, Northern Shoveler)



Duck Pairs

- > 100
- 75-100
- 50-75
- 25-50
- 0-25

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



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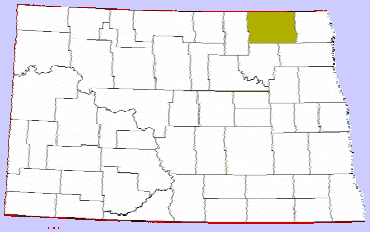
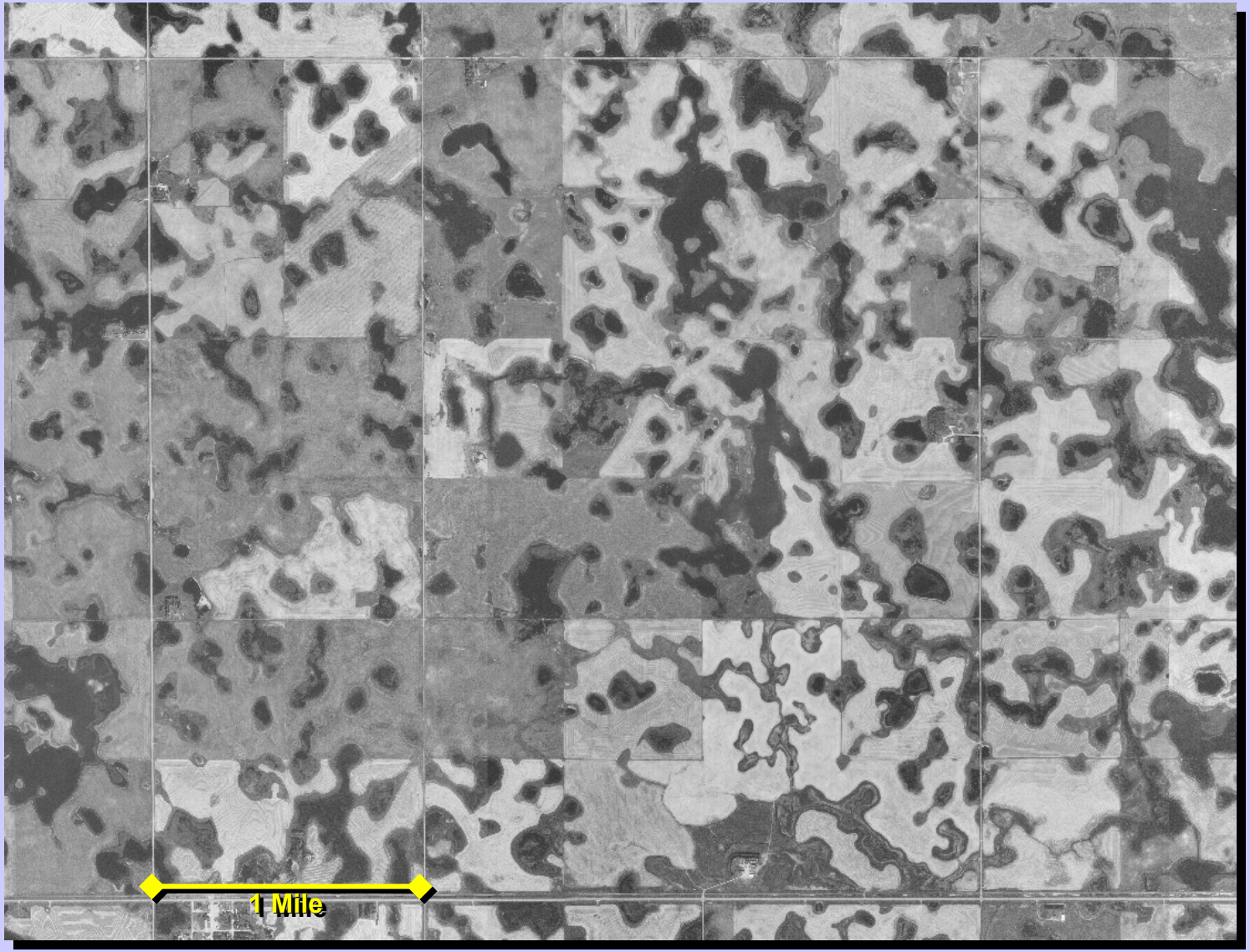
Wetland Resources

North Dakota



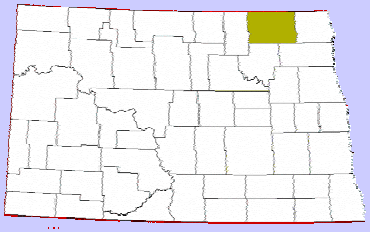
Cavalier County



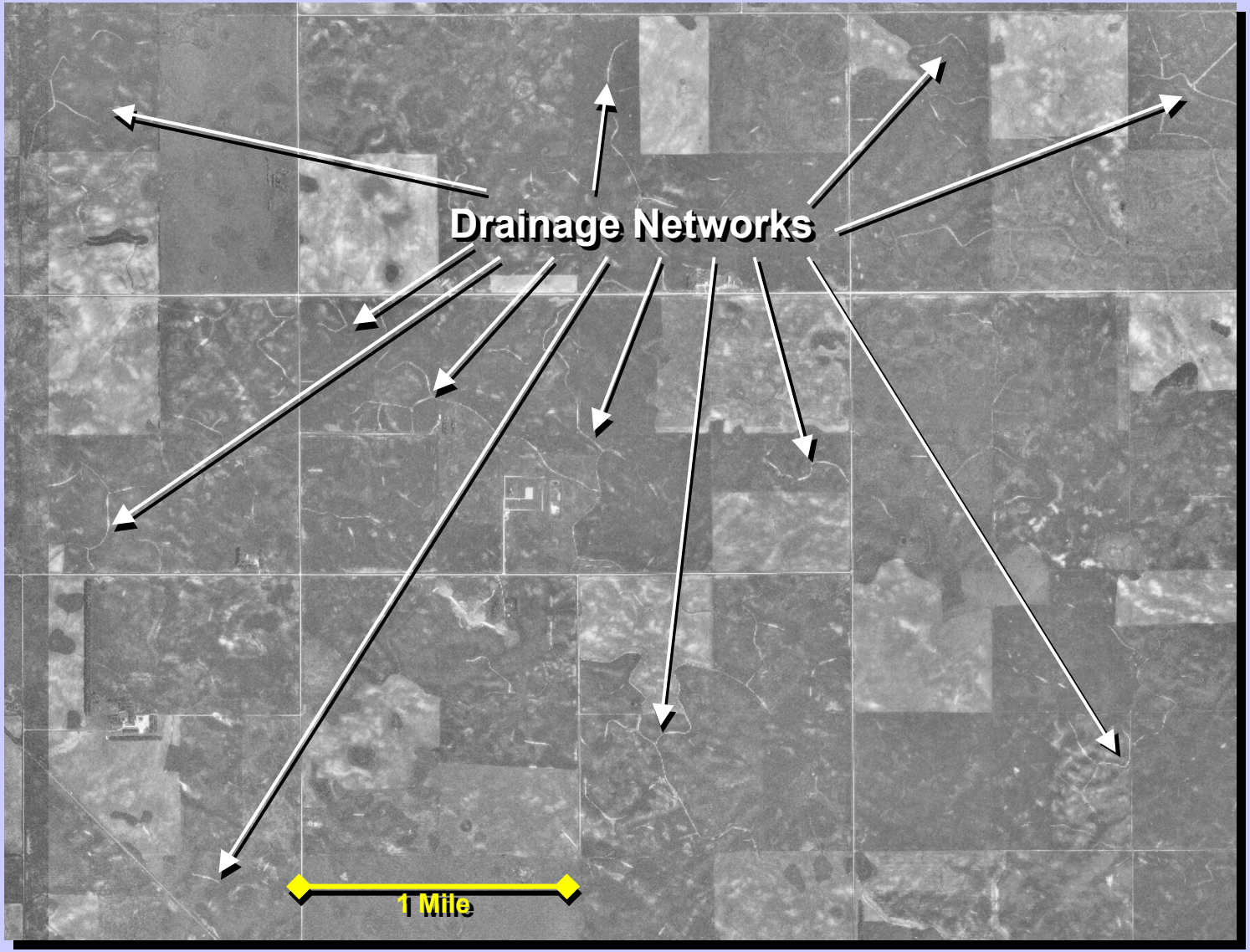
Area With Mostly Intact Wetlands

Total Loss of The Wetland Resource

North Dakota

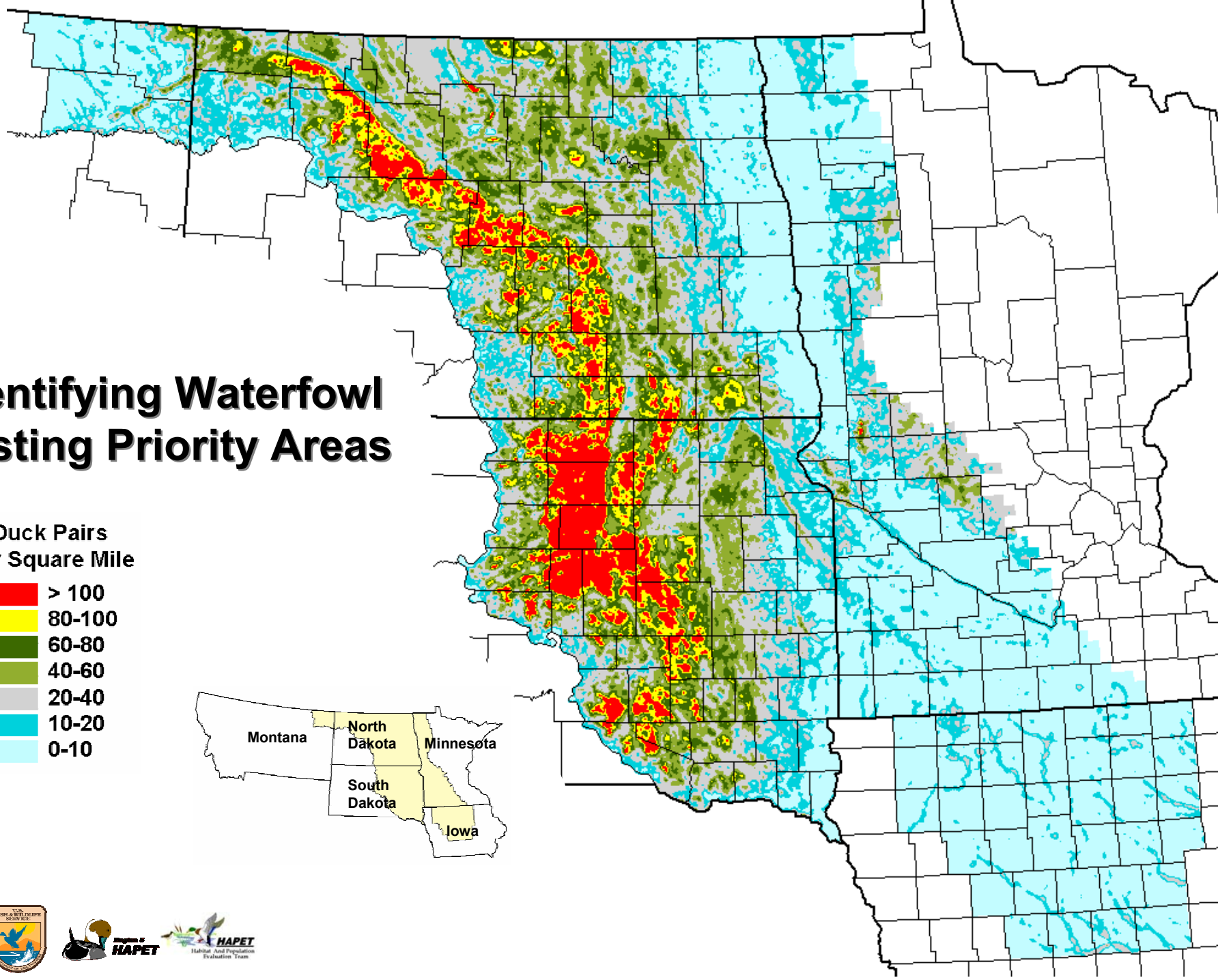


Cavalier County

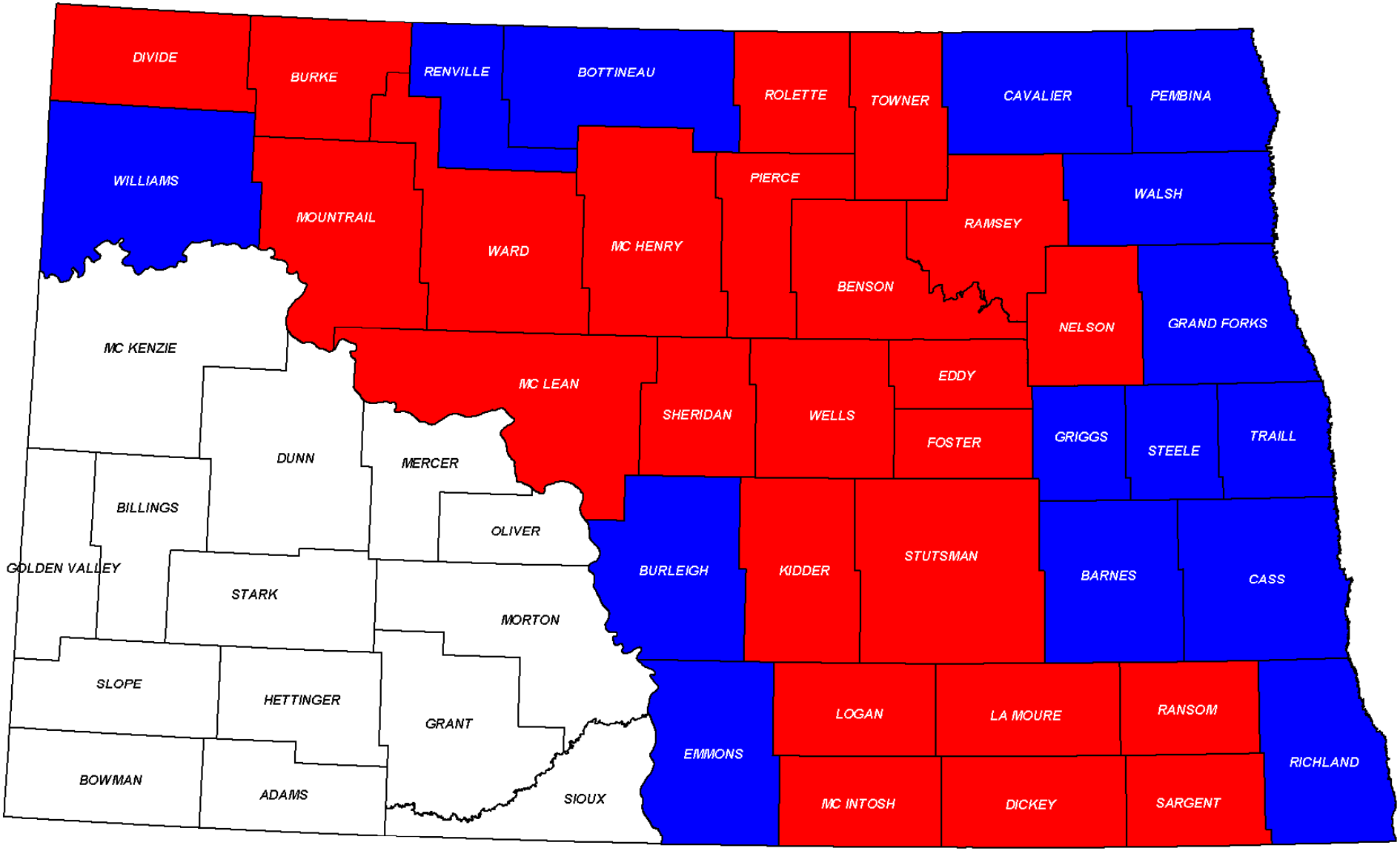


Area 6.5 Miles South Where Most Wetlands Have Been Completely Drained

Identifying Waterfowl Nesting Priority Areas



Changes in CRP Acreage Relative to Duck Density

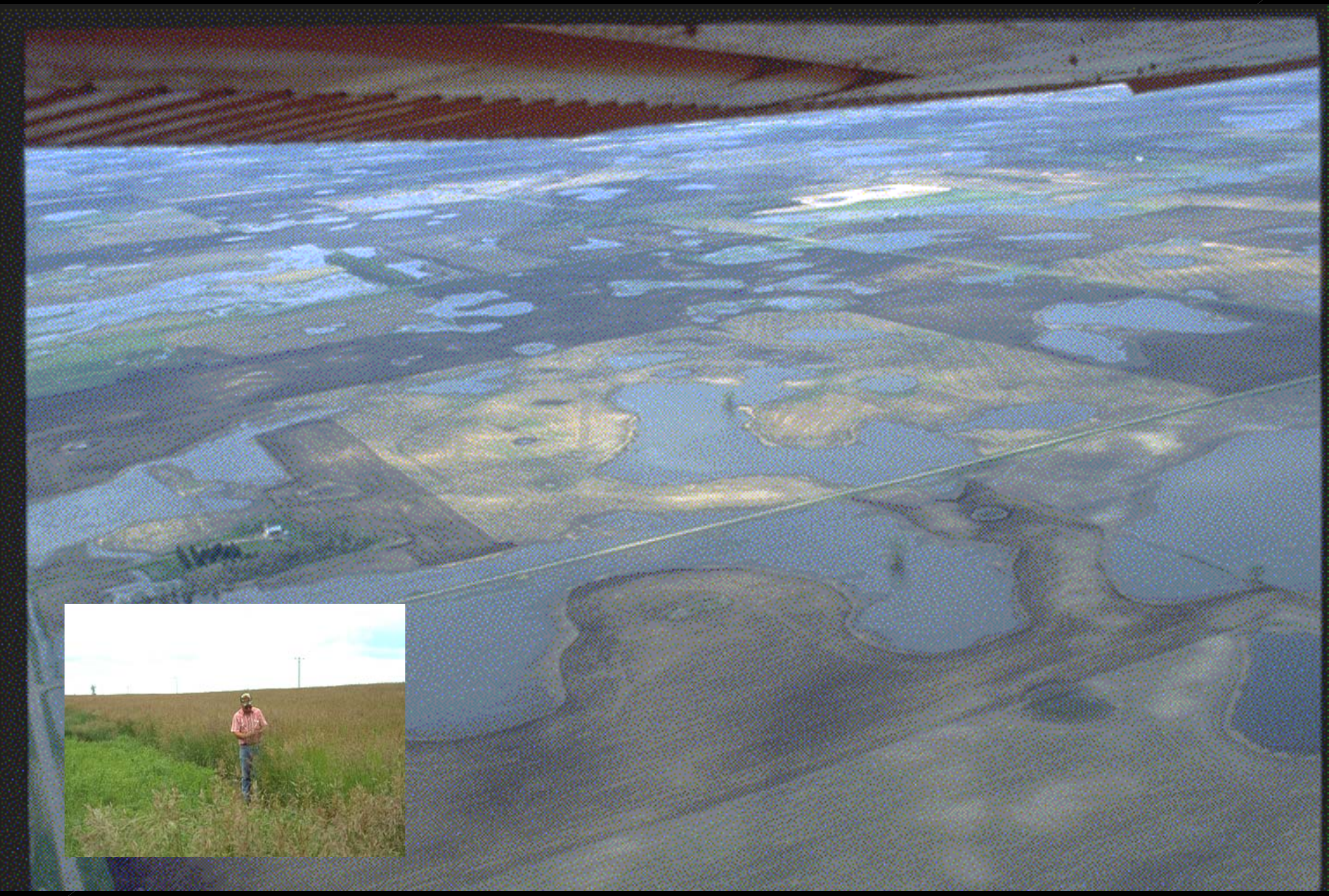


COUNTIES WITH HIGH DUCK POPULATIONS=11% INCR. IN CRP

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 <u>CONSERVATION PRIORITY AREA.</u>



C R P