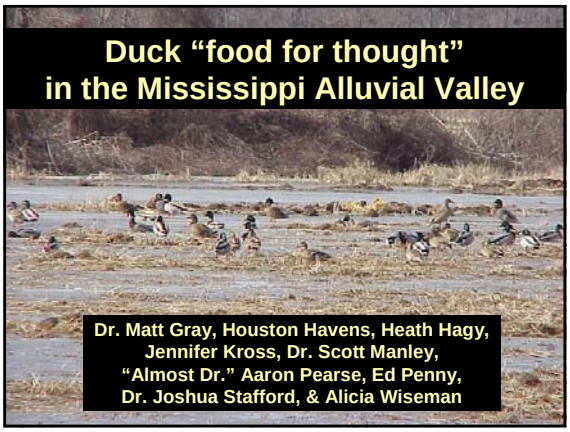
Duck “food for thought” in the Mississippi Alluvial Valley



Dr. Matt Gray, Houston Havens, Heath Hagy, Jennifer Kross, Dr. Scott Manley, “Almost Dr.” Aaron Pearse, Ed Penny, Dr. Joshua Stafford, & Alicia Wiseman

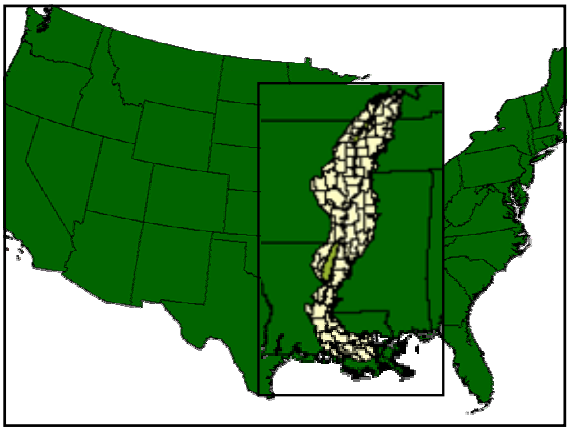
Sponsors and Partners

- Delta Wildlife
- Delta farmers and landowners
- Ducks Unlimited, Inc.
- Natural Resources Conservation Service
- North American Wetlands Conservation Council
- States of Mississippi and Arkansas
- USFWS, Region 4
- USGS, Patuxent Wildlife Research Center
- Mississippi State University, FWRC
- Monsanto Corporation

Objectives

1. Review recent research on waterfowl food availability

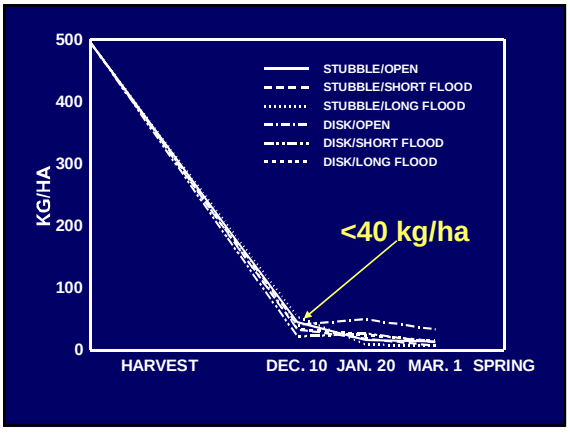
2. Review management strategies to increase food availability

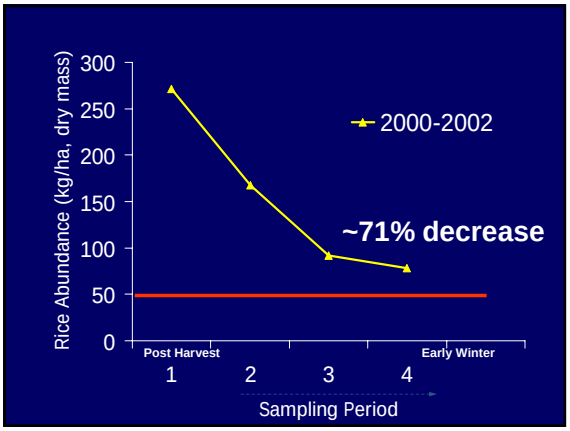


10 Reasons to Winter-Flood Rice and Other Croplands

1. Rice is an energy-rich food for waterfowl
2. Decomposes crop residues
3. Reduces winter weeds
4. Reduces herbicide use in spring ($25-30 / acre)
5. Replenishes ground water
6. Improves water quality
7. Saves soil
8. Waterfowl hunting and wildlife watching
9. Generates income from hunting lease$
10. Benefits local economie$

From: Manley et al. (2004, 2005, 2007), *Journal of Wildlife Management* 68:74-83; *Wildlife Society Bulletin* 33:981-992; *Journal of Soil & Water Conservation,* in review.



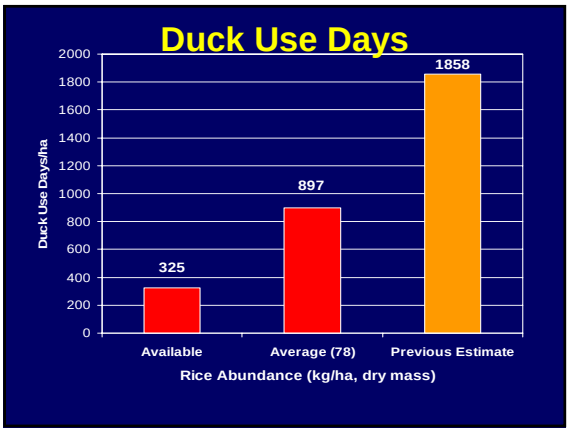


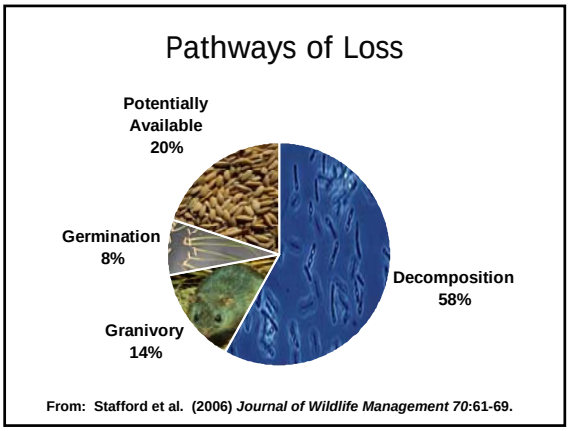
Duck Use Days (DUDs)

(*aka* Duck Energy Days)

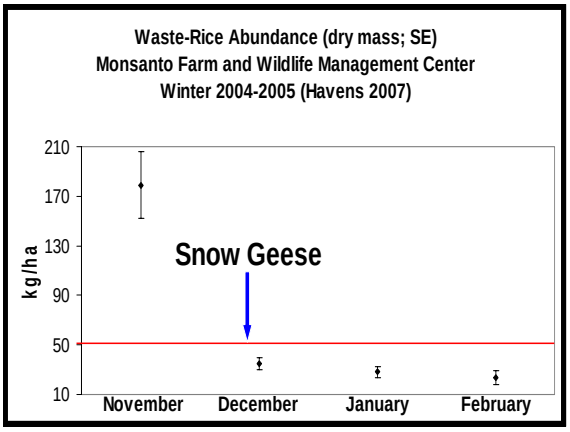
DUDs = Food Availability x Energy Value
Daily Energy Requirement of Ducks

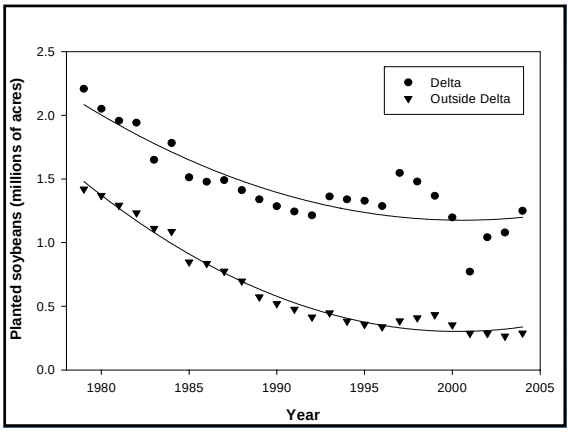
DUDs index the potential of areas to provide foraging habitat





From: Stafford et al. (2006) *Journal of Wildlife Management 70*:61-69.




Planted soybeans (millions of acres)
2.5
2.0
1.5
1.0
0.5
0.0
1980
1985
1990
1995
2000
2005
Year
Delta
Outside Delta


1980's Soybean & Duck Lands
Thickets today!

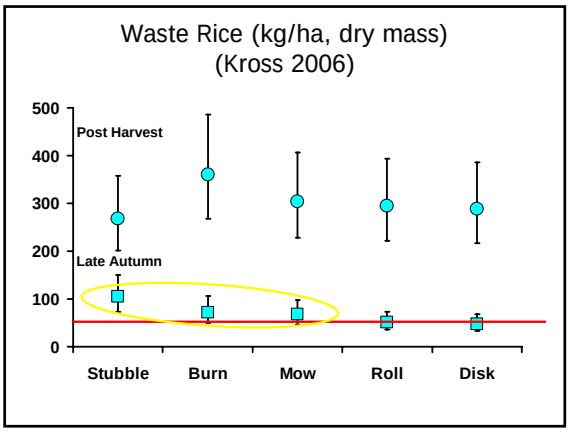
Mallard Population Indexes (Jan. 1980s vs. 2000s) for Mississippi Delta and Missouri (Jan. 2007)

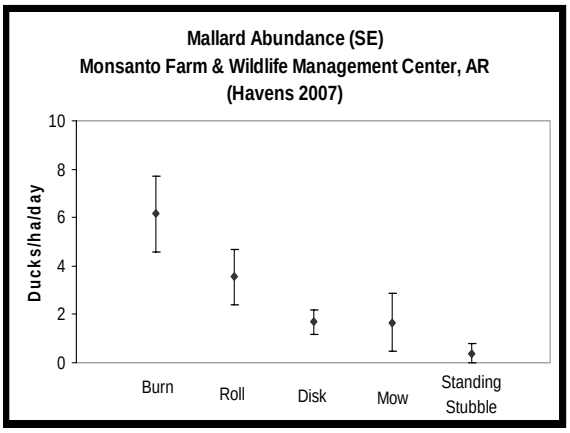
Mississippi Delta Late 1980s (Reinecke et al. 1992)	Mississippi Delta Early 2000s (Pearse 2007)	6 Missouri Areas Early Jan. 2007
$\bar{x}$ = 362,209	$\bar{x}$ = 150,360 (~60% decrease from Reinecke estimate)	242,546 (~60% increase from Pearse estimate)

What have we learned?

1. **Less waste rice, soybean, and other "hot" foods, and fewer ducks in the Mississippi Delta**

2. **How do we mitigate decreased quality of foraging habitats?**




Mallard Abundance (SE)
Monsanto Farm & Wildlife Management Center, AR
(Havens 2007)
Ducks/ha/day
10
8
6
4
2
0
Burn
Roll
Disk
Mow
Standing Stubble


Burn to conserve waste rice, attract ducks, reduce stubble, & $ave

“Spring” Rice for “Winter” Ducks

“Refreshing” Food Availability Post-Harvest

- Over seed harvested crop fields with millets
- Stimulate natural ‘seed bank’ to germinate by flushing fields

Moist-soil Habitat - Summer

Not weeds to waterfowl!

Energy Values of Duck Foods

(Kaminski et al. 2003, *Journal of Wildlife Management* 67:542-550)

Food	Kcal/g
Corn	3.67
Rice	3.34
Moist-Soil Seeds ~80% energy value of corn and rice	2.79
Acorns	2.67
Soybeans	2.65

Harvested Rice Field vs. Moist-Soil

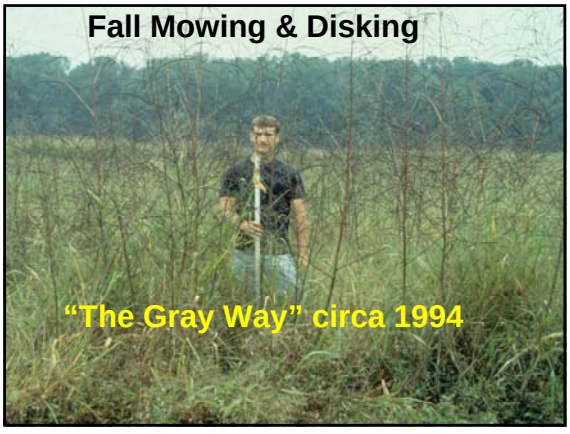
(Stafford et al. 2006, Penny 2003, Kross 2006)

Habitat	Mean (kg/ha)	DUDs
Rice	78 ± 15%	897
Moist-Soil	496 ± 13%	4,196

** 5-6 times more food and DUDs

Fall Mowing & Disking

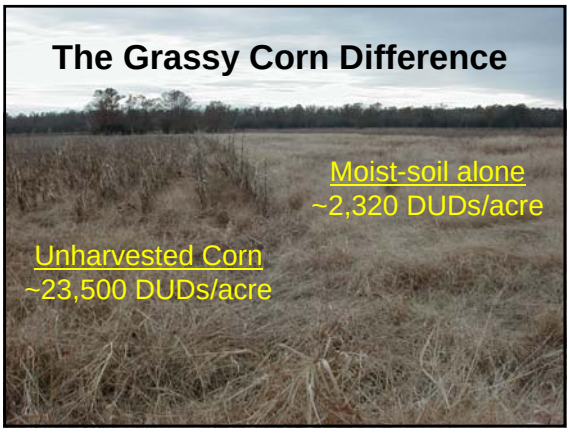
Fall Mowing & Disking



Making Moist-soil "Hot"

- "Dirty" Rice
- "Grassy" Corn
- "Grassy" Milo

The Grassy Corn Difference



"Grassy Corn Groceries"

"Grassy Milo"

Alicia Wiseman's M.S. research

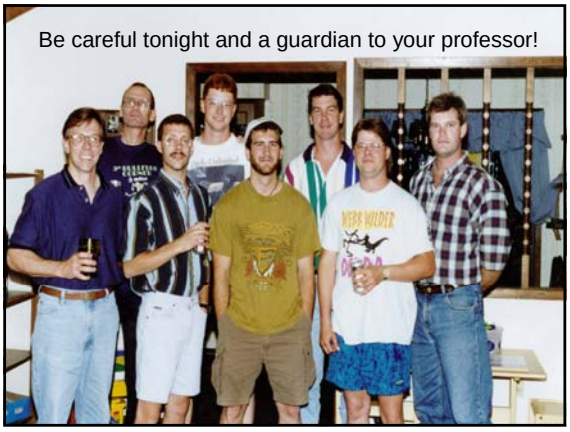
Can Quail Management
"Fledge" Duck Habitat?

Take-home Messages

1. Food availability has decreased in harvested MAV croplands.
2. Mallard populations have declined concurrently.
3. Active habitat management can abate food and duck declines.


Habitat is vital!
Actively manage it, and…


they will come!


Be careful tonight and a guardian to your professor!