

Integrating Shorebird Management into Coastal Wetland Impoundment Regimes - at Edwin B. Forsythe NWR

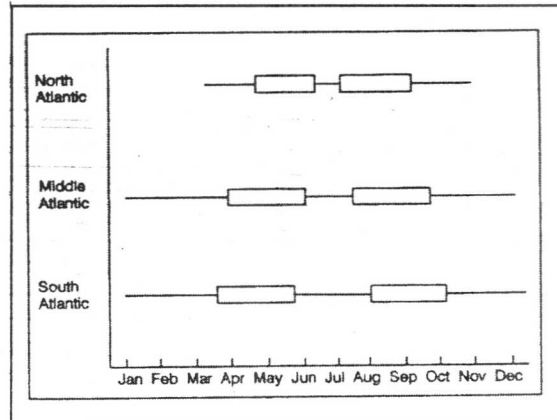
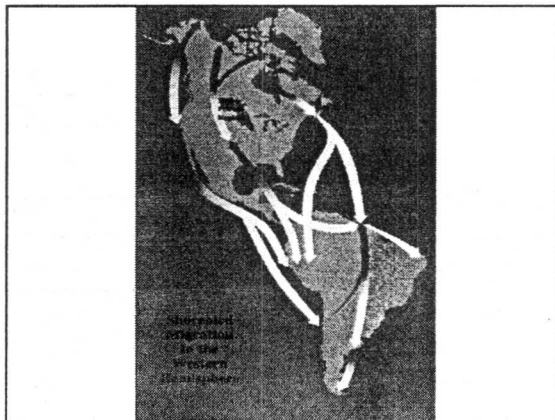


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INTRODUCTION

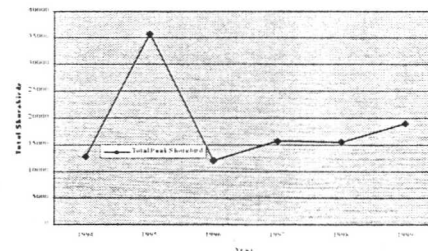
Shorebirds represent the greatest waterbird migrants in terms of flight distances. Many nest in the arctic and winter in the Southern Hemisphere.

- Lesser Golden-Plovers for example, may complete 16,000 mile round trip efforts in one annual cycle!
- White-rumped sandpipers travel more than 9,000 miles in the span of about a month.
- Sandpipers typically balloon from 35g to almost 50g in three to four weeks. They can fly 4,000 miles, from Canada to Surinam in one 40-hour non-stop hop.



Phenology of Peak Shorebird Use (top 10 species) of the Edwin B. Forsythe NWR. 1994-2001 data (★ = rare to occasional)				
SPECIES	North Migration	South Migration	Winter	Breeding
Black-bellied Plover 383 = peak x	✓	✓	✓★	
Semipalmated Plover 1391 = peak x	✓	✓		
Ruddy Turnstone 87 = peak x	✓	✓		
Greater Yellowlegs 867 = peak x	✓	✓	✓★	
Short-billed Dowitcher 1035 = peak x	✓	✓		
Dunlin 6237 = peak x	✓	✓	✓	
Least Sandpiper 486 = peak x	✓	✓	✓★	
Western Sandpiper 415 = peak x		✓	✓★	
Semipalmated Sandpiper 7159 = peak x	✓	✓	✓★	

Fig. AA. Total Annual Peak Shorebird Use Observed During Weekly Wildlife Drive Surveys at Edwin B. Forsythe NWR, 1994-99



SHOREBIRD ECOLOGY

- During spring & fall migration, shorebirds rely on a few specific stopover habitats to replenish fat reserves to allow them to fulfill nutrient requirements needed to complete migration.

...Some shorebird species complete migration within 40-60 hours

SHOREBIRD ECOLOGY

Relative to other NTMB's, shorebirds exhibit narrow habitat requirements and huge energy requirements that limit them to relatively few, highly productive stopover sites with high densities of intertidal invertebrates.

...Many shorebirds increase body mass up to 100% at staging areas

SHOREBIRD ECOLOGY

- Shorebirds use the same coastal staging areas year after year due to their productivity and prey availability.
- In coastal areas invertebrate prey consists primarily of benthic marine polychaetes, molluscs and crustaceans...whereas in breeding areas they depend on Chironomidae (midge larvae).

SHOREBIRD ECOLOGY

- In the Mid-Atlantic region, peak shorebird use of coastal wetlands occurs during summer/fall and spring migration...
- Shorebirds spend up to 9-10 months per year on non-breeding areas

SHOREBIRD MANAGEMENT

- An integrated shorebird/wading bird/waterfowl management strategy provides supplemental shorebird habitat at high tide.
- Managed wetlands can be preferred to local natural mudflat areas at low tide due to higher invertebrate densities

...Managing wetland for forage plants produce more plant structure with increased surface area that attract invertebrates.

U.S. Fish & Wildlife Service has promoted the expanded use of

"ADAPTIVE MANAGEMENT."



- Develop management actions based on best science as "experiments"

- Monitor effects

• "Adapt" management based on new information to improve wildlife objectives.

U.S. Fish & Wildlife Service has promoted the expanded use of "adaptive management."



- Mosquito control represents our greatest obstacle to improving shorebird habitat.
- Improvements are needed in balancing wildlife objectives with mosquito control objectives.
- We used this concept at the Forsythe NWR to improve habitat for shorebirds, wading birds, and waterfowl without compromising mosquito control.

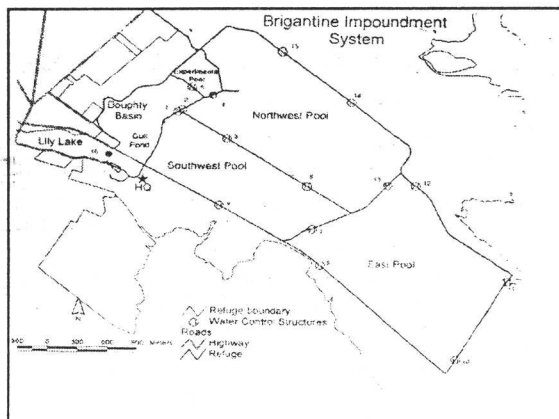
MANAGEMENT FOCUS



Protect/preserve natural foraging & roosting habitats with significant shorebird concentrations.

Reduce disturbance in areas with high shorebird habitat use.

Enhance foraging & roosting habitats in managed wetlands through manipulations.



ENHANCING MANAGED WETLANDS



– Natural tide cycles shaped the life history of wetland invertebrates, birds and fish.

– Management should attempt to mimic natural tide cycles in brackish wetlands and make freshwater habitats available during critical periods.

WATER MANAGEMENT PLAN



- Our water management strategy involves two components:
 - » 1.) Mimic natural tidal rhythm, the process that drives how the system functions. Shorebirds use habitats opportunistically.
 - » 2.) Wildlife cues (i.e., peak shorebird migration) trigger water level management
- ...70% of shorebird species use water depths under 10 cm (4 in.)

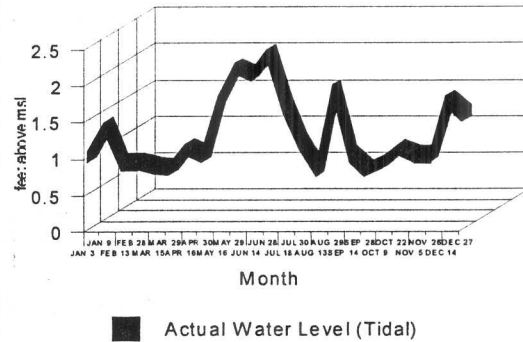
Specific optimum water levels and depths for foraging shorebirds, waterfowl and wading birds in managed, non-tidal impounded wetlands at Edwin B. Forsythe National Wildlife Refuge during 2002.

Taxa	Optimum water depth	Temporal periods	East Pool	SW Pool	NW Pool
Larger shorebirds and wading birds (herons, stilts & wilets)	18cm	April through May July through September	Total	0.2-1.2 0.4-1.0	<2.0 1.8-2.0
Medium-sized shorebirds (dowitchers & yellowlegs)	5-15cm	April through May July through September	Total	0.0-0.8 0.4-1.0	<1.5 1.6-2.0
Smaller shorebirds (sandpipers & plovers)	1-5cm	April through May July through September	Total	0.0-0.6 0.4-1.0	<1.0 1.0
Waterfowl	15cm	November through March	Total	1.6-2.0	0.8-1.7
Wading birds	18cm	June Through August	Total	1.6-2.0	<2.0

Unit: East Pool Objectives:

- Reduce abundance of *Phragmites* and increase native aquatic vegetative cover by 10% each during 2002.
- Provide optimum tidal, open-water wetland habitats for migrating and wintering waterfowl and shorebirds by allowing tidal flow to provide shallow-water and mudflat foraging habitats through 2002.
- Provide improved nesting and brood-rearing habitats for *Rallidae* (especially black rails) by maintaining tidal flow through 2002 and by increasing native aquatic vegetative cover by 10% each during 2002.
- Provide optimum foraging habitat for piscivorous migratory birds (e.g., *Ardeidae* [egrets and herons], *Laridae* [skimmers and terns]) by allowing tidal flow to continue through 2002.

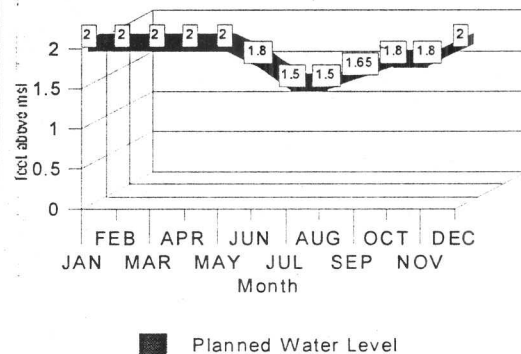
Fig 1. East Pool Water Level Management at Edwin B. Forsythe NWR during 2001.



Unit: Northwest Pool Objectives:

- Reduce *Phragmites* and Salt Marsh Fleabane (*Pluchea purpurascens*) coverage by 10% each in 2002.
- Encourage the growth of widgeon grass (*Ruppia maritima*) and dwarf spikerush (*Eleocharis parvula*) on a minimum of 50% of the unit in 2002 through late-season, partial drawdown and maintain as freshwater reservoir for current moist soil unit (Southwest Pool).
- Provide optimum foraging, resting and loafing habitat for fall-migrating shorebirds and waterfowl on 25% and 50% of the unit, respectively during 2002.

Fig 2. Northwest Pool Water Level Management at Edwin B. Forsythe NWR, 2002.



Unit: Southwest Pool Objectives:

- Reduce coverage of *Phragmites* and Salt Marsh Fleabane by 10% during 2002.
- Provide moist soil conditions on 75% of the unit during the 2002 growing season to promote dense high energy seed-producing annual plants beneficial to fall-migrating and wintering waterfowl.
- Provide moist soil conditions on 75% of the unit during the 2002 growing season to provide optimum foraging habitat for spring-migrating shorebirds.
- Provide access to food for fall-migrating shorebirds (i.e. invertebrates) and waterfowl (i.e., *Eleocharis*) on 85% of the unit through water level manipulation beginning in late August through December, 2002.

Fig 3. Southwest Pool Water Level Management at Edwin B. Forsythe NWR, 2002.

