

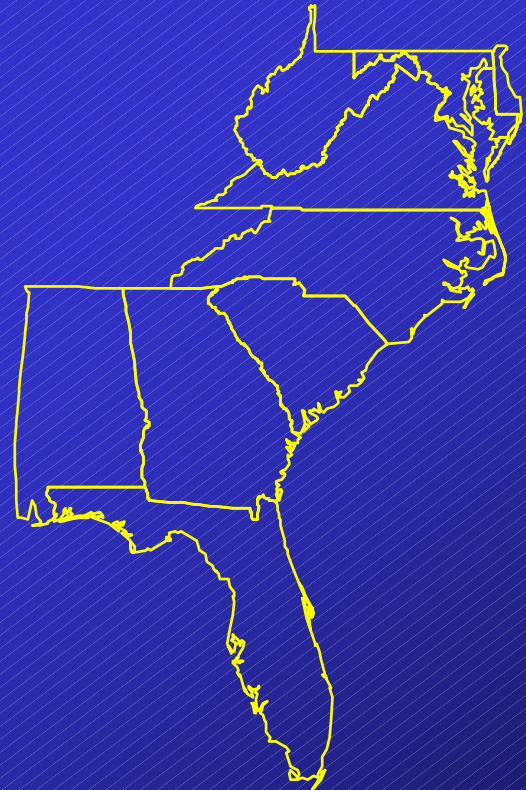
Southeastern Coastal Plains and Caribbean Region Shorebird Conservation Plan

Population and Habitat Objectives



Population

- **Estimates range from 4.5 to 5 million birds.**
- **About 2 million estimated to use managed and inland wetlands**



Habitat Objectives

- **Initial target is of 15,203 acres (6,081 ha), or 25% of all shorebirds using impoundments and inland habitats.**
- **As more Refuges, State and private land owners get involved, a revised target of 30,405 acres (12,162 ha) is proposed (50% of birds).**

Multi-species Management

Shorebirds



Waterfowl



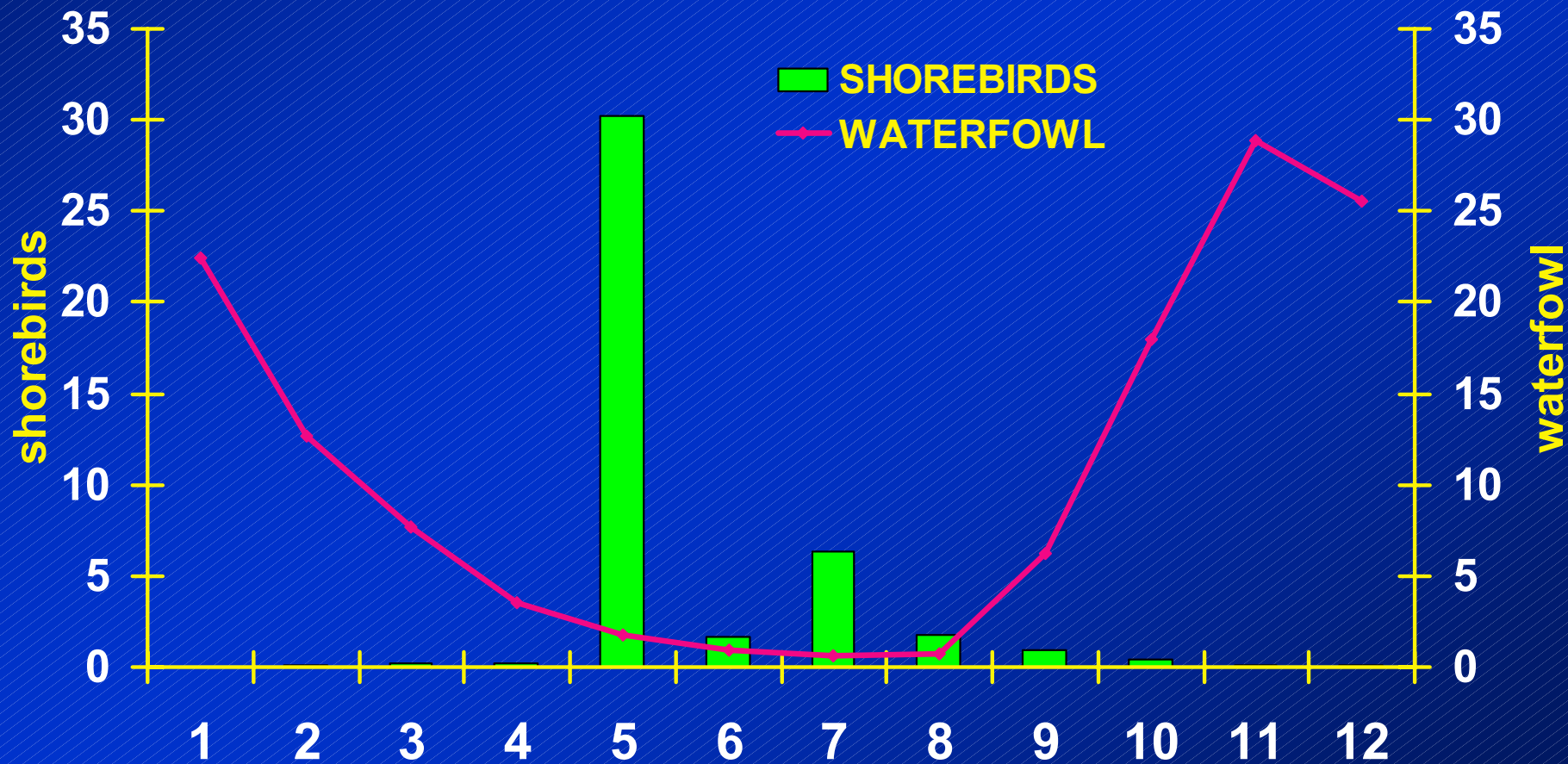
Wading Birds



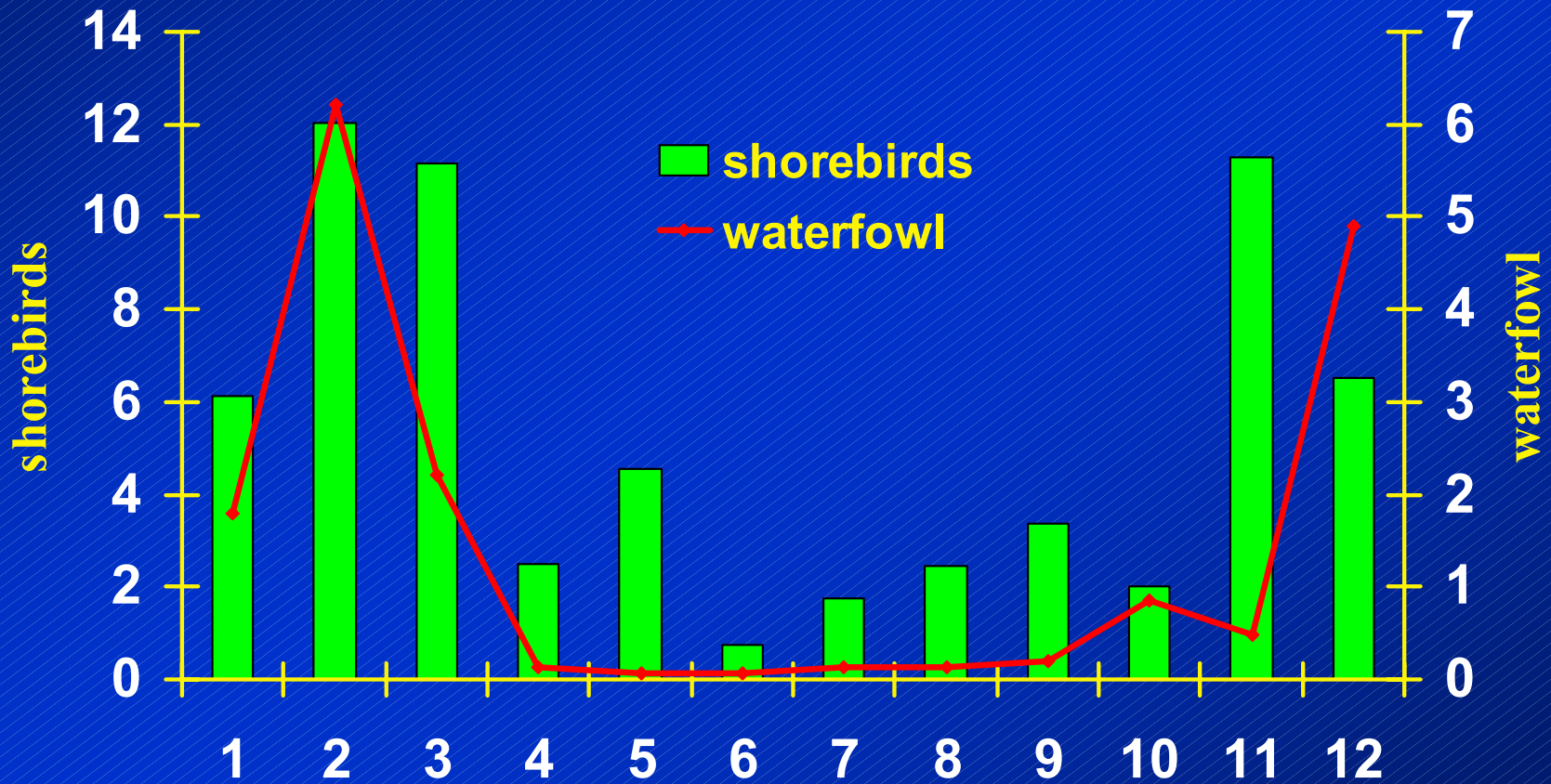
Mosquito Control



Seasonal numbers/ha of shorebirds and waterfowl at Pea Island NWR.



Seasonal numbers/ha of shorebirds and waterfowl at Merritt Island NWR.



How much?

- Loesch et al. 1995 energetics model

- Area needed = $\left[\begin{array}{c} \text{Food} \\ \text{Intake} \end{array} \right] * \text{MLS} * \left[\begin{array}{c} \text{Population} \\ \text{Size} \end{array} \right] \div \left[\begin{array}{c} \text{Prey} \\ \text{Density} \end{array} \right]$

Essential Information

- **Shorebirds**

- species composition and numbers
- migration dynamics (e.g., MLS)

- **Habitat requirements**

- openness
- accessibility (depth)
- prey base



Pea Island NWR

**Yawkey Wildlife
Center**

Merritt Island NWR

Caribbean



Essential Information

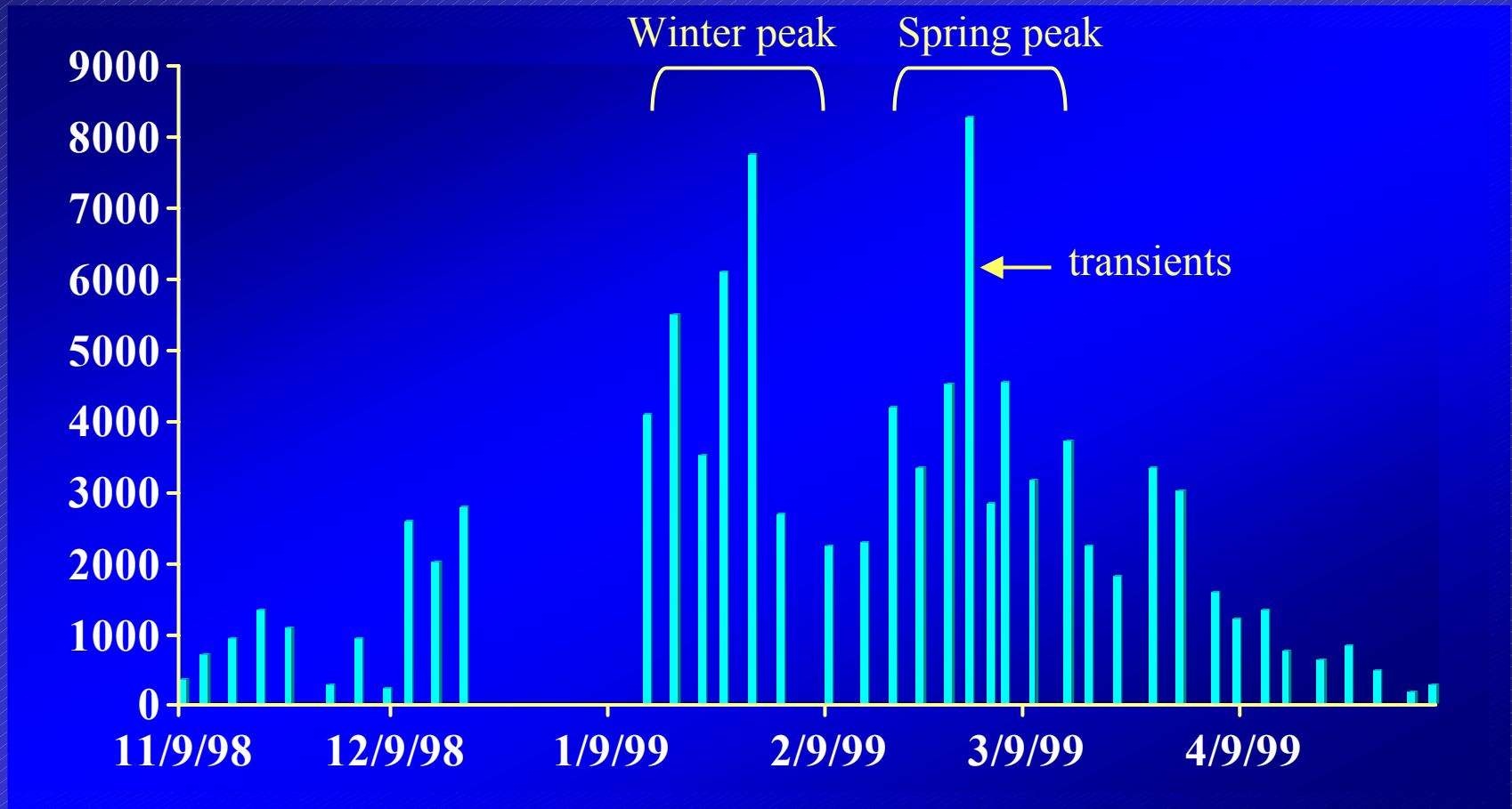
- **Shorebirds**

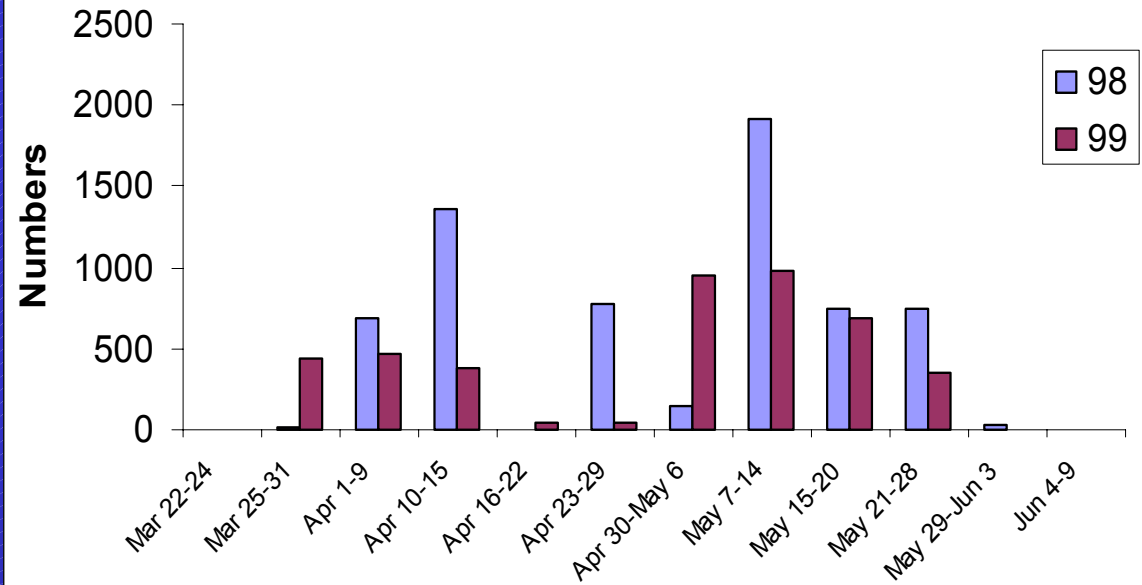
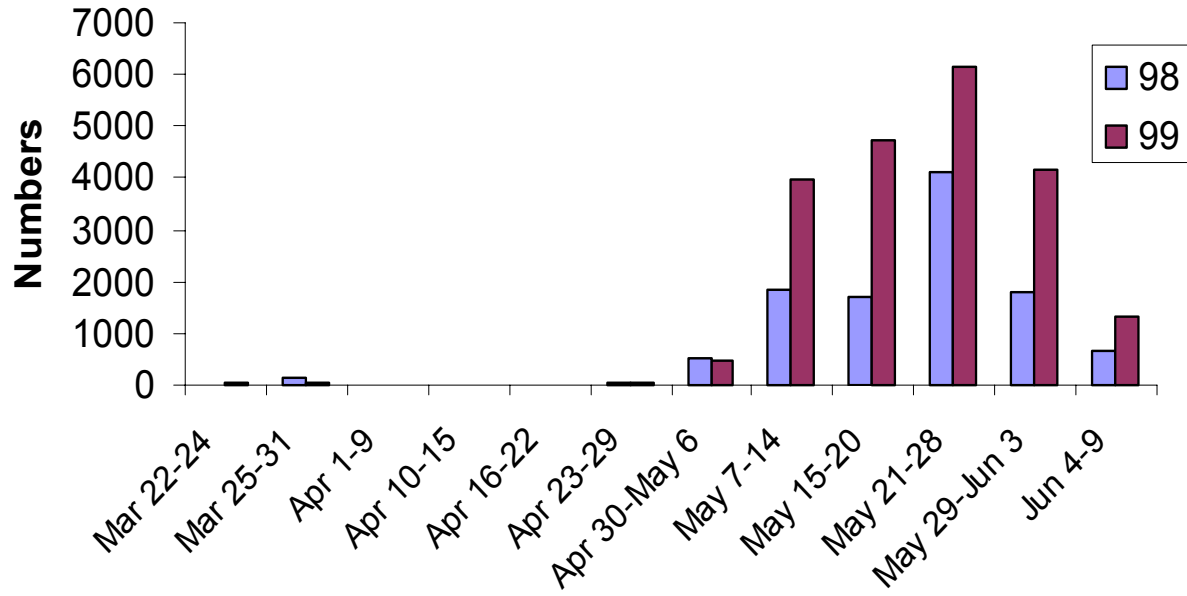
- species composition and numbers
- migration dynamics (MLS)

- **Habitat requirements**

- openness
- accessibility (depth)
- prey base dynamics

Migration chronology of Dunlins





Population estimates and number of Dunlins departing from Merritt Island NWR in 1998.

<u>Date</u>	<u>Road Count</u>	<u>N_i</u>	<u># departing area</u>
2/19-2/25	3,746	6,592	0
2/26-3/4	3,908	7,060	2,667
3/5-3/11	2,631	2,600	4544 142
3/12-3/18	4,265	1,911	712
3/19-3/25	2,948	4,559	890
3/26-4/1	1,875	6,137	2,449
4/2-4/8	712	3,530	107
4/9-4/15	1,146	1,451	229
4/16-4/22	1,016	1,013	2347 212
4/23-4/29	796	1,305	462
4/30-5/6	401	2,033	0
5/7-5/13	288	959	753
Seasonal Means	1,978	3,262	
Total Departures			8,623
Estimated Site Use			11,885

Essential Information

- **Shorebirds**

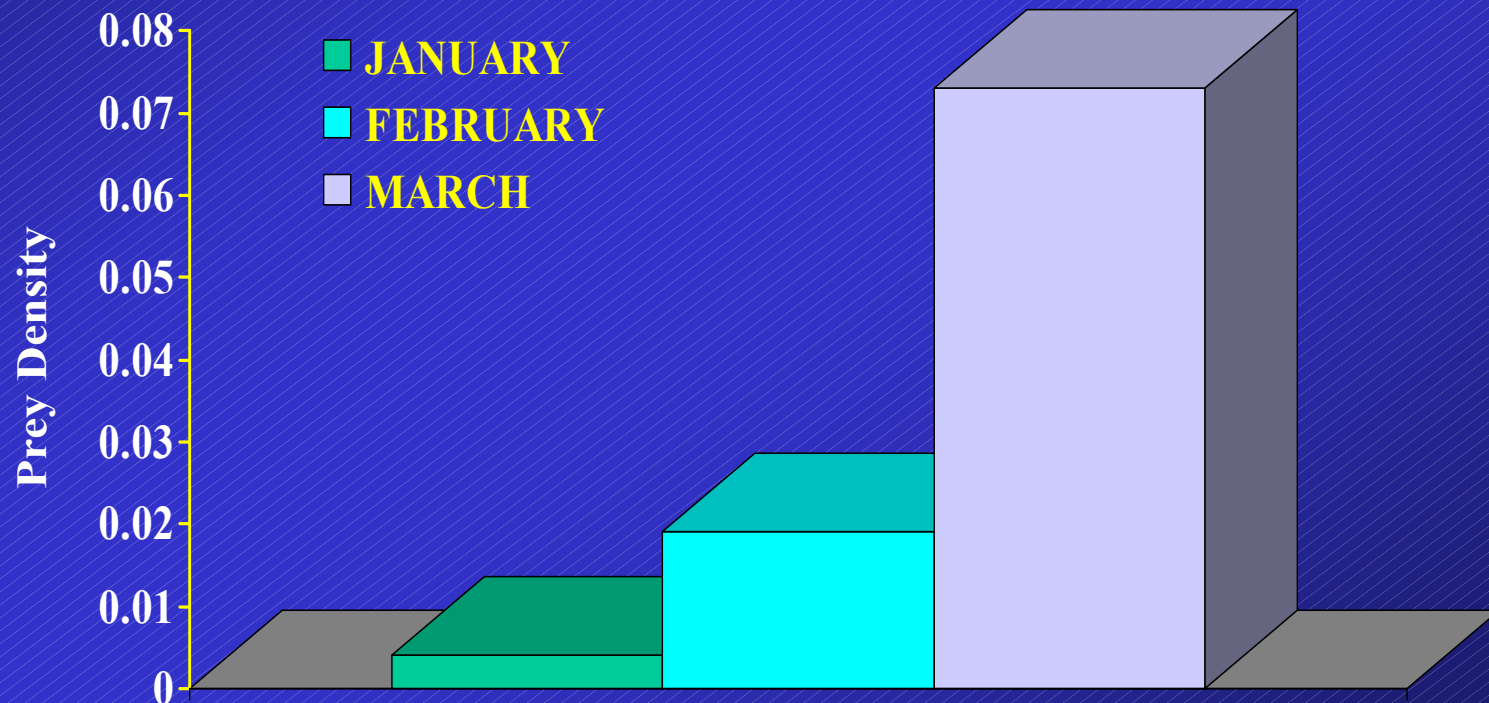
- species composition and numbers
- migration dynamics (TO, MLS)

- **Habitat requirements**

- **openness**
- **accessibility (depth)***
- **prey base dynamics**



Average prey density (cm³) found in 7 impoundments in Merritt Island NWR (1999).



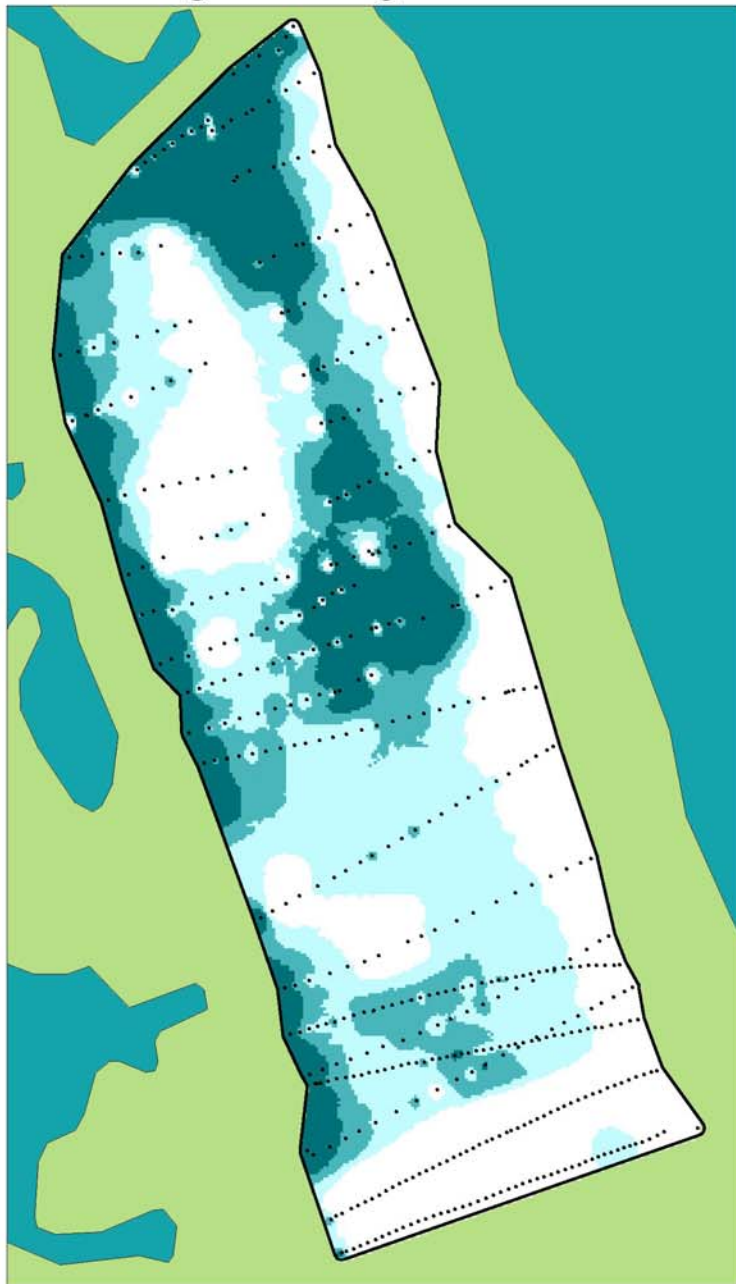
Suitable shorebird
habitat is shallow



Deep water limits access

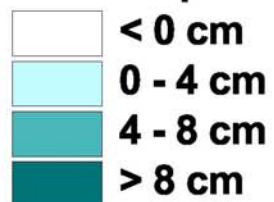


Staff Gauge Reading of 1.2



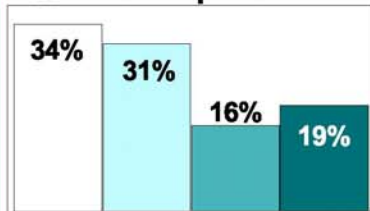
Water Depth at Pea Island Impoundment North Pond

Water Depth

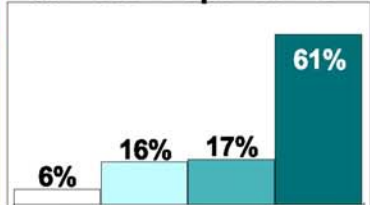


• Sample Sites

% Water Depth at 1.2



% Water Depth at 1.8



300 0 300



Meters

Staff Gauge Reading of 1.8



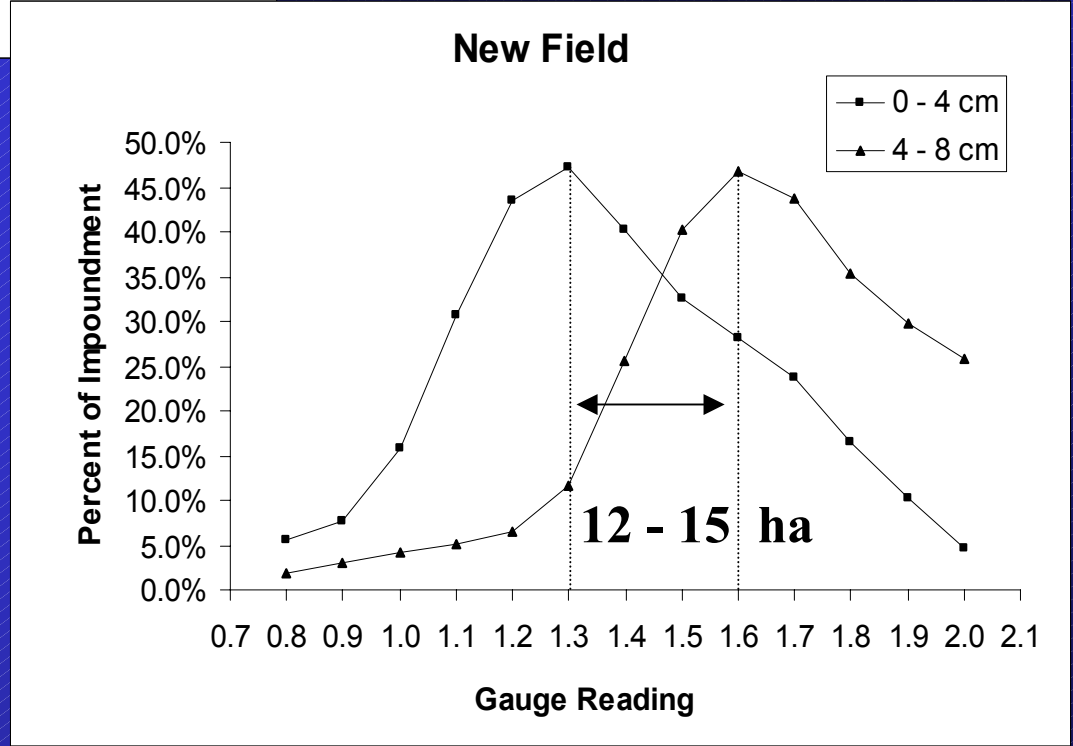
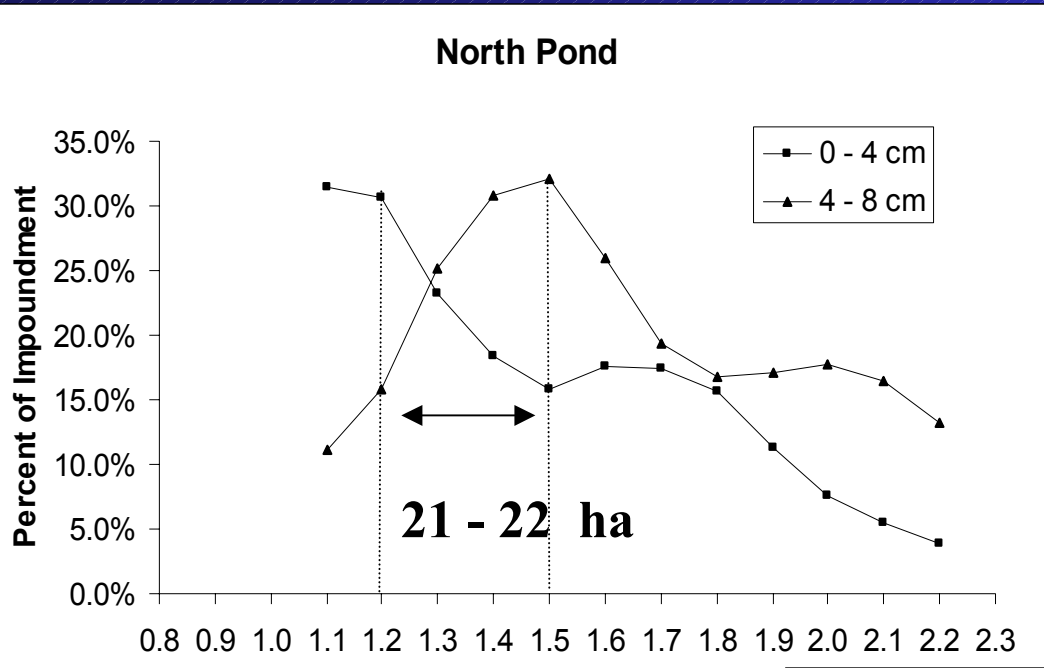
- Shorebirds in SE US strongly represented by small calidrids (e.g., dunlins, semipalmated sandpipers).
- Access positively correlated with length of tarsusmetatarsus.

****Depths of
0-4 cm most
Important**

**Depths of
4-8 cm also
used-dowitchers**



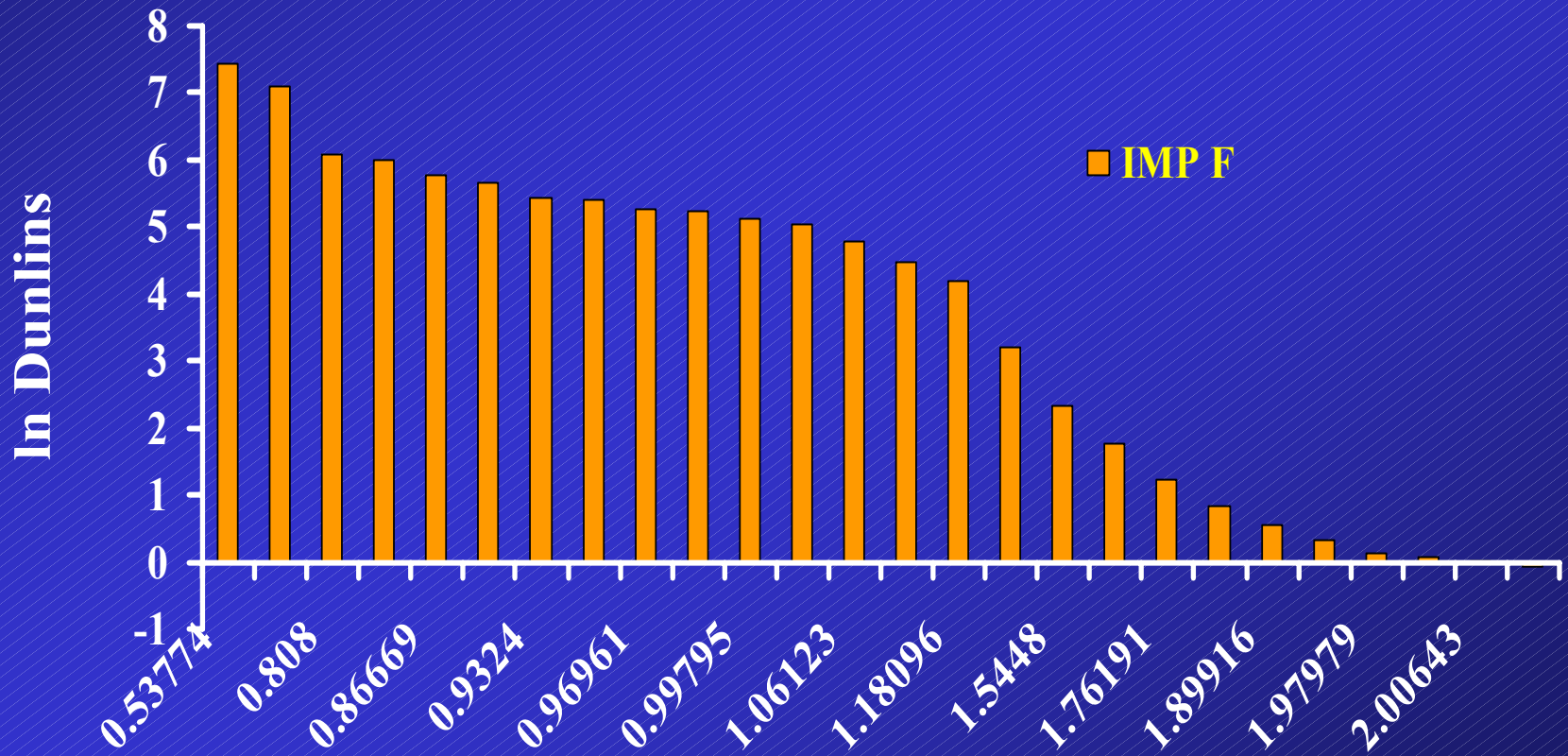
Water level targets for two impoundments at Pea Island NWR.



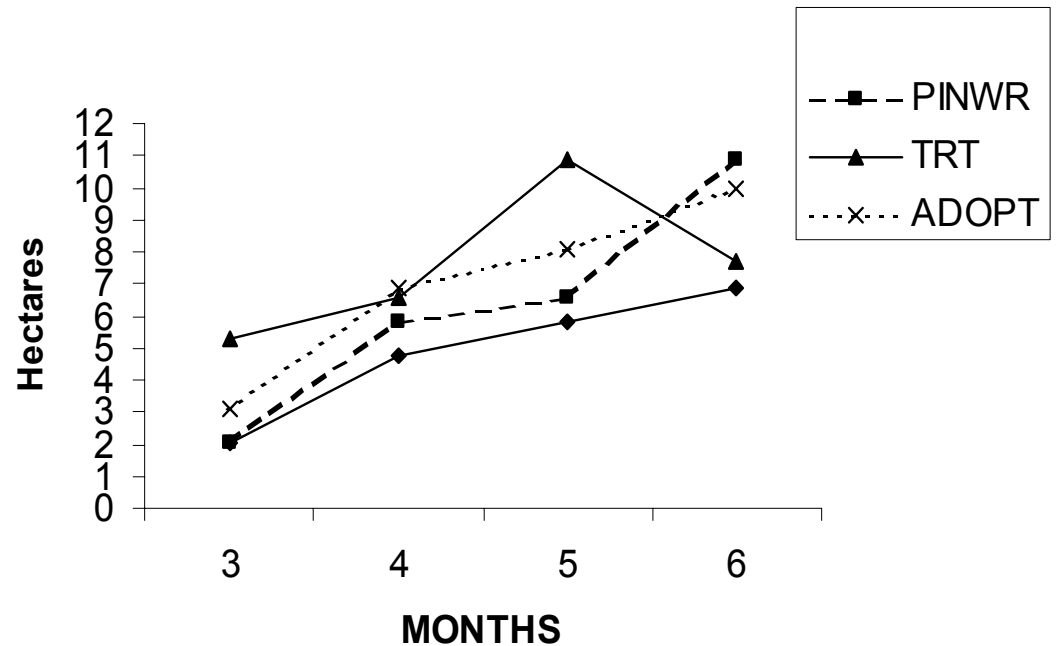
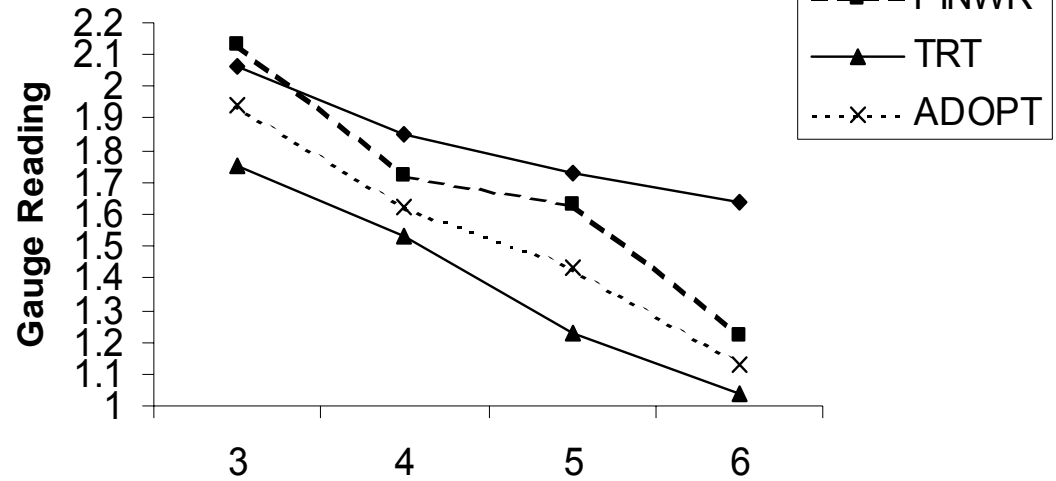
Water Control Structures



Mean number of Dunlins (ln) as a function of increasing water depth variance, MINWR.



Use available data to evaluate your management scheme – adaptive.



How much?

- Loesch et al. 1995 energetics model

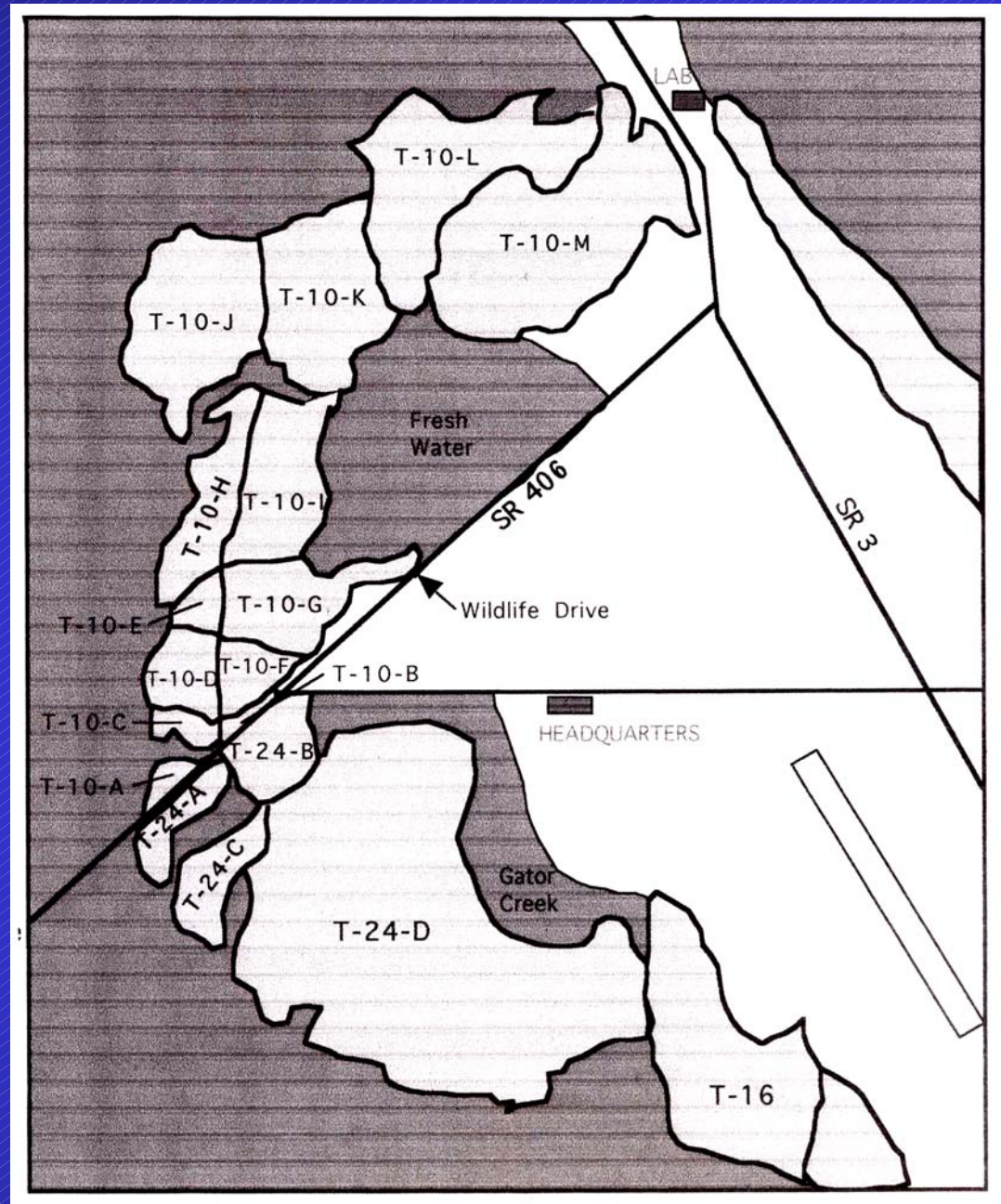
- Area needed = $\left[\begin{array}{c} \text{Food} \\ \text{Intake} \end{array} \right] * \text{MLS} * \left[\begin{array}{c} \text{Population} \\ \text{Size} \end{array} \right] \div \left[\begin{array}{c} \text{Prey} \\ \text{Density} \end{array} \right]$

Habitat area requirements according to Loesch model-MINWR

	Daily Food Intake	MLS	#DUNL	<i>Hypoth.</i> <u>Hectares Required</u> 2.00gr/m ²	<i>Actual</i> <u>Hectares Required</u> 0.45gr/m ²	<u>Actual Hectares Available</u> <i>access & openness</i>
Winter 1998	6	24	11,669	84	373	324
Spring 1998	8	18	3,478	25	111	862
Winter 1999	6	28	23,642	198	882	541

Merritt Island NWR

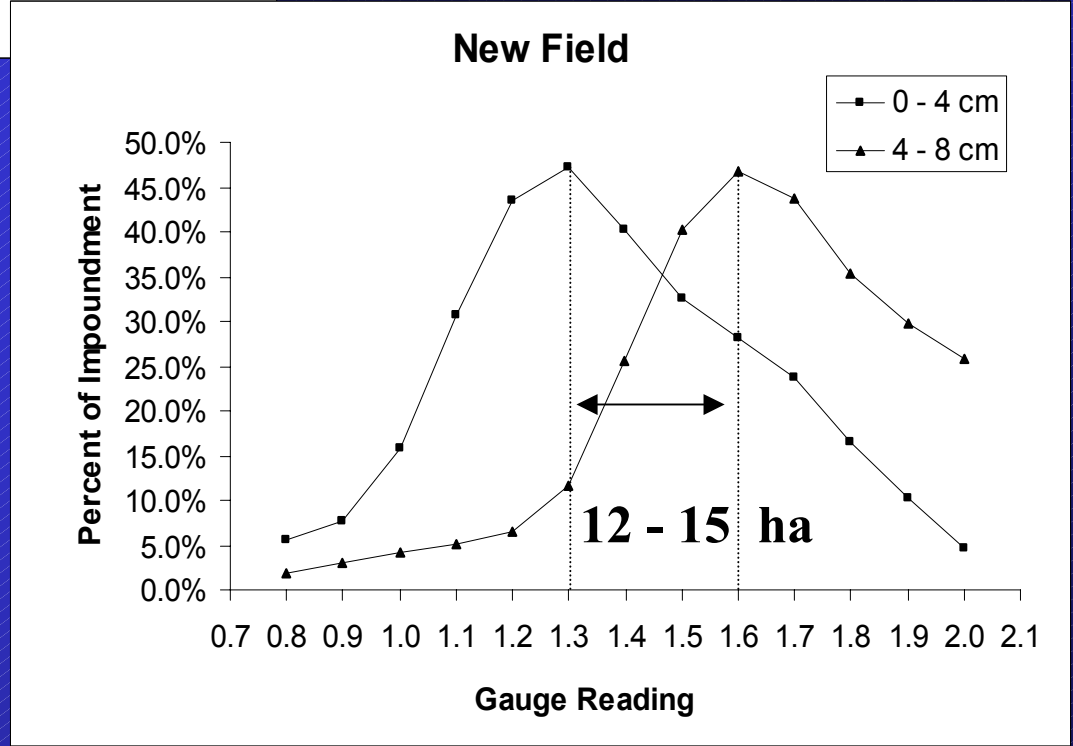
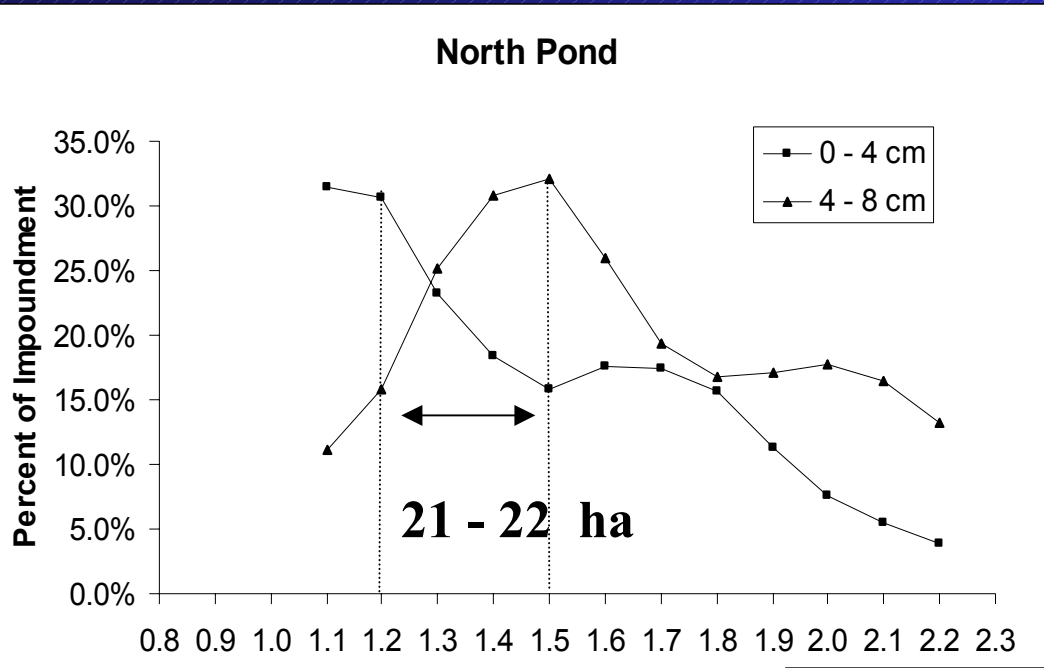
T-10s & T-24s impoundments



Habitat area requirements according to Loesch model - PINWR

	Daily Food Intake	MLS	Num.	<i>Hypoth.</i> <u>Hectares Required</u> 2.00gr/m ²	<i>Actual</i> <u>Hectares Required</u> 6.44 gr/m ²	<u>Actual Hectares Available</u> <i>access & openness</i>
Spring 1998- SESA	8	12	7,000	33	10	37
Spring 1998- DUNLIN	8	19	3,000	22	7	37

Water level targets for two impoundments at Pea Island NWR.



Management Recommendations

- **Know your clientele and chronology**
- **Understand relationship between water gauge and proportion of accessible habitat**
- **Estimate area requirements**
 - **Wildlife inventories-numbers**
 - **Prey density and biomass**
 - **Ascertain MLS estimates for your area (e.g., SE)**
- **Stagger draw downs**
- **Context – coordinate geographically?**

