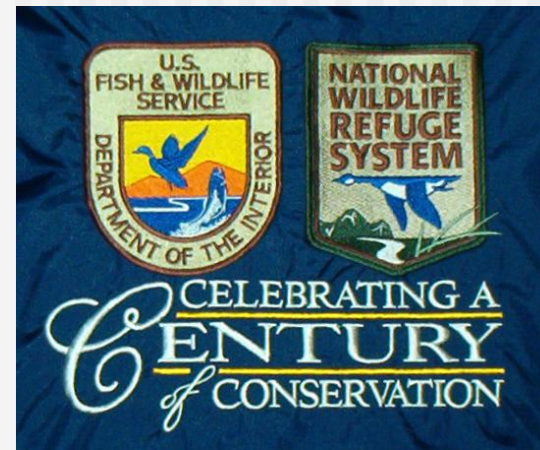


# *Mosquito control on refuges along Florida's Indian River Lagoon:*

*Merritt Island NWR & Pelican Island NWR*

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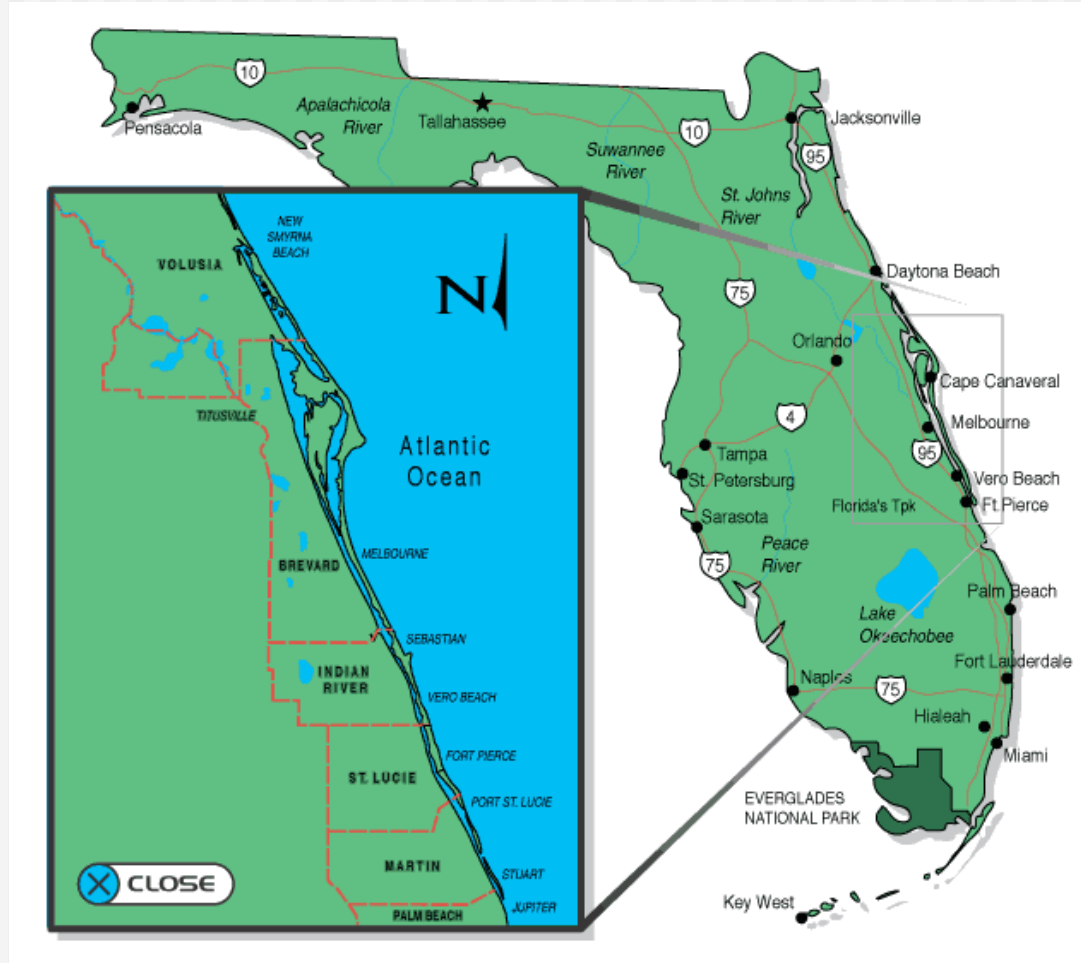
***Doug Carlson***

Indian River MCD  
Vero Beach, FL

# Indian River Lagoon

## *"Estuary of National Significance"*

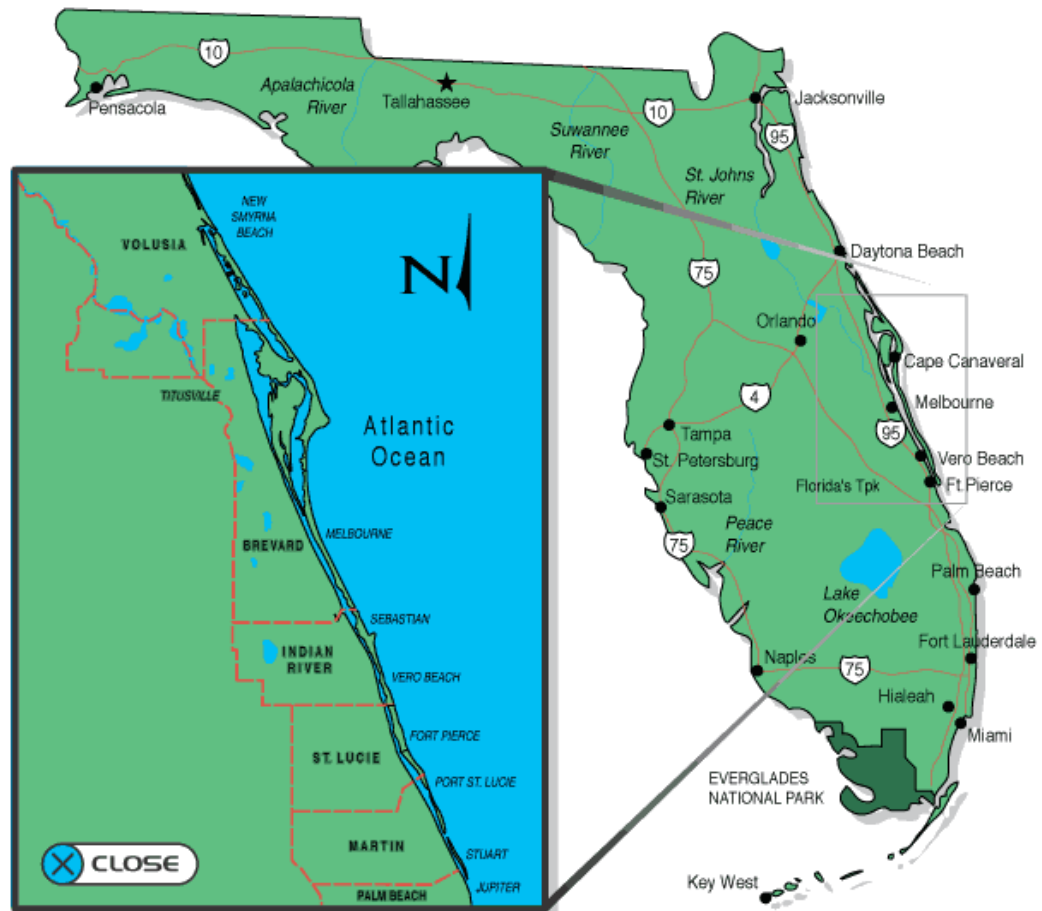
- Lagoonal estuary – where fresh and salt water mix
- 156 miles long; =40% of Florida's east coast
- 5 inlets connect the IRL to the Atlantic Ocean



# Indian River Lagoon

## "Estuary of National Significance"

- America's most diverse estuary with 4,000+ species of plants & animals
- Salt marshes & mangrove swamps occur on the east & west banks, also on islands within the IRL



# *Impoundment management*



- Of the 40,000 acres of impoundments created, 20,000 acres occur on the Merritt Island National Wildlife Refuge near the Kennedy Space Center.
- Flooding high marsh impoundments eliminates egg-laying sites for salt-marsh mosquitoes.
- Effective and economical mosquito control method greatly reducing need for pesticide applications in the impounded marsh.

## *Environmental problems of impounding:*

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- Interferes with movement of water and organisms between marsh and estuary.
- Deep flooding can kill native vegetation.



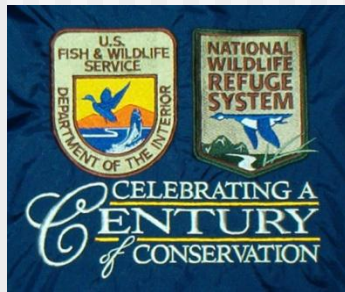
## *Other benefits of impounding:*

- Benefits resident fish (ones that can live their entire life-cycle within the marsh).



- Large fish populations feed wading birds.
- Can also allow for waterfowl (duck) management.

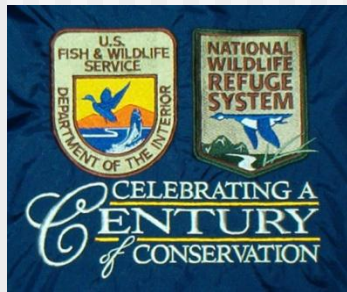




# Refuge Overview



	Pelican Island NWR (Within the Indian River MCD, created 1903)	Merritt Island NWR (Within the Brevard Co. MCD, created 1963, NASA property, USFWS is land manager)
<i>Size</i>	5300 acres ***** 1000 ac. = mangrove swamps	140K ac. = total ***** 70K ac. = estuarine habitat and marshes
<i>Mosquito-producing habitats</i>	<ul style="list-style-type: none"> <li>■ Mangrove swamps (includes islands)</li> <li>■ Disturbed uplands</li> </ul>	<ul style="list-style-type: none"> <li>■ Salt marshes</li> <li>■ Maple bay swamps</li> <li>■ <i>Spartina bakerii</i> marshes</li> </ul>



# Refuge Objectives



Pelican Island NWR	Merritt Island NWR
<ul style="list-style-type: none"><li>■ Protect historic rookery on Pelican Island</li><li>■ Protect habitat for migratory birds &amp; endangered species</li><li>■ Provide outreach, education and recreation opportunities.</li></ul>	<ul style="list-style-type: none"><li>■ Provide habitat for migratory birds &amp; endangered species</li><li>■ Provide habitat for wildlife diversity</li><li>■ Provide recreation including hunting, fishing, photography &amp; education.</li></ul>



# Refuge Overview



	Pelican Island NWR (Indian River Co.)	Merritt Island NWR (Brevard Co.)
<i>Primary species</i> *****	<i>Ae. taeniorhynchus</i>  *****	<i>Ae. taeniorhynchus</i> <i>Ae. sollicitans</i>  *****
<i>Secondary</i>	<i>Ae. sollicitans</i> <i>Cx. nigripalpus</i>	<i>Cx. nigripalpus</i>
<i>Permissions required</i>	Pesticide Use Permit (PUP) ***** Special Use Permit (SUP; annually)	Contract w/NASA  (NASA is land owner; USFWS is land manager)



# Refuge Overview



	Pelican Island NWR (Indian River Co.)	Merritt Island NWR (Brevard Co.)
<i>Larviciding</i>	<p><i>Bti</i></p> <p>Altosid (=methoprene)</p> <p>(approx. 1200 ac. treated)</p>	<p><i>Bti</i></p> <p>(approx. 12K acres treated)</p>
<i>Source reduction</i>	<p>400 acres of impoundments</p> <p>*****</p> <p>300 ac. pumped</p>	<p>25K acres of impoundments</p> <p>*****</p> <p>4800 ac. pumped</p>



# Cooperative efforts



- Impoundment management for waterfowl (=duck) habitat.
- Impoundment management to enhance feeding opportunities for wading birds.
- Habitat restoration to rehabilitate disturbed sites while minimizing mosquito problems.





# *U.S. Fish & Wildlife Service Conservation Service Award*

Highest honor bestowed by the Secretary to private citizens for contributions to the mission and goals of the Department.

**In 1986, awarded to Jack Salmela,  
Director of Brevard MCD:**

*“Presented for his endless contributions to wildlife conservation through effective mosquito control techniques and personal dedication to effective management of wildlife resources.”*

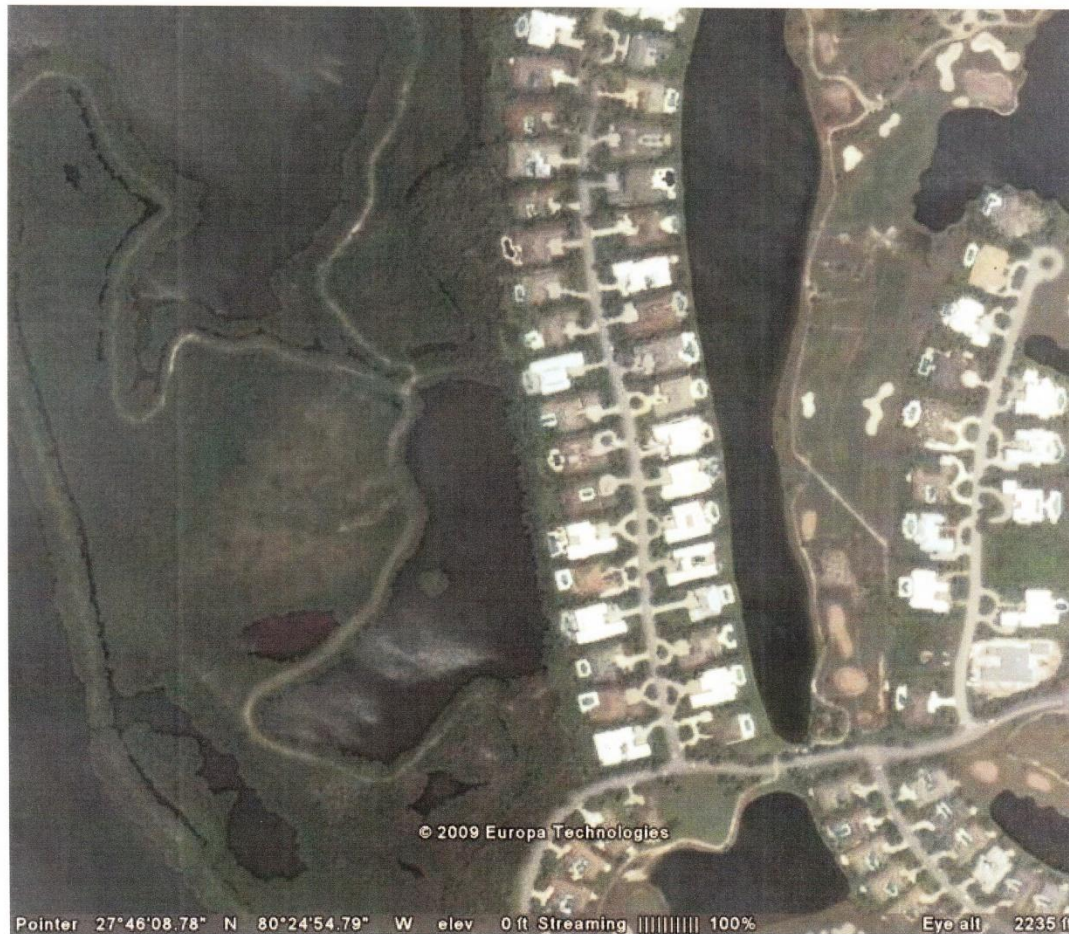
# *Primary concerns with draft policy*

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- What constitutes a “*health threat*”
- Determination of “*no economic impact*”



# *Adjacent Development*



# Merritt Island NWR & Pelican Island NWR

