

Movements and Habitat Use by Radio Tagged Manatees along Florida's Northern Big Bend Coast

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ABSTRACT

Florida manatees (*Trichechus manatus latirostris*) range along the northern Gulf of Mexico coast from Florida to Louisiana, and occasionally to Texas. However, little is known about specific manatee use areas and habits west of the Suwannee River. Photo identification studies in the region have documented individually identifiable scarred manatees, many of which over-winter at Crystal River or Wakulla Springs State Park.

To document manatee movement and habitat use patterns along the northern Gulf, we radio tagged manatees from April 2008 through October 2011. We deployed Argos-linked GPS tags on fourteen manatees (7 females, 7 males); 6 in Crystal River and 8 in the Wakulla. Manatee size classes ranged from sub-adult to large adult.

Tracking data revealed the use of estuarine and marine seagrass beds that provide ample forage along the Big Bend coast, with abundant freshwater vegetation also accessed within the lower reaches of coastal rivers. Spring migration timing and paths for tagged manatees traveling north from Crystal River varied by individual, but typically included foraging and freshwater resources of coastal creeks and rivers (Suwannee, Steinhatchee, Econfinia, Aucilla, and Wakulla/St Marks rivers).

From late spring through fall, manatee use focused primarily on the coastal estuaries and rivers from the Aucilla River to Apalachicola, with the greatest concentration of use at the Wakulla/St Marks rivers and in Apalachicola Bay. Migrations to warm water refuges at Wakulla Spring and Crystal River were primarily triggered by the onset of early winter cold weather, although we also documented mid-winter migrations south from Wakulla.

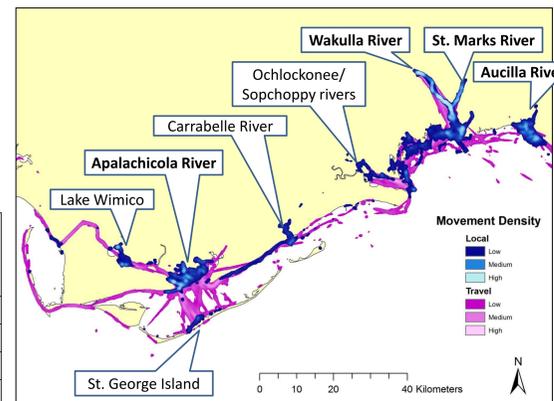
Understanding the distribution of resources and patterns of use in this area will be valuable for managing the increasingly large numbers of manatees utilizing the northern extent of their Gulf coast range.

RESULTS and DISCUSSION

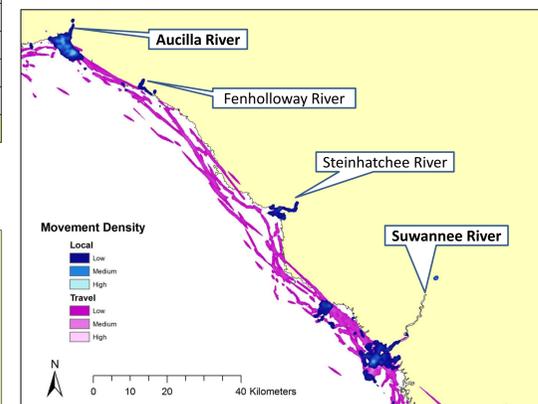
Fourteen manatees were tagged and tracked for a total of 4813 days (13.2 tracking years); average tracking days per individual was 344 days. Tracking bouts (individual tag deployments) were typically terminated due to tether weak-link breakage. Retagging belted manatees enabled multiple tracking bouts for some individuals.

ID No.	Name	Sex	Size Class	Number of Bouts	Begin Date	End Date	Days Tracked	Days between bouts	Total days tagged
TCR-10	Ebb	F	SA	3	16-Apr-08	4-Apr-09	354	0	354
TCR-11	CR505	F	MA	2	17-Apr-08	1-Jun-08	45	0	45
TPH-01	Izzy	F	LA	5	19-Jun-08	12-Oct-10	830	15	845
TCR-12	Ellie	F	MA	3	12-Jan-09	15-Jul-09	184	0	236
TCR-13	CR018	M	MA	9	12-Jan-09	8-Sep-11	935	34	969
TBH-02	Harold	M	SA	6	19-Mar-09	31-Aug-11	736	159	895
TPH-02	Zip	M	SA	3	8-Dec-09	18-May-11	351	175	526
TPH-03	2 Notch	M	SU	3	9-Dec-09	01-Dec-10	257	100	357
TCR-19	Dash	M	MA	3	23-Mar-10	6-Jul-11	334	136	470
TPH-04	Coontie	F	SU	1	2-Jun-10	20-Jun-10	18	0	18
TPH-06	Muse	F	MA	2	3-May-11	Present	172	6	178
TPH-07	Taz	M	SU	1	8-Jun-11	Present	142	0	142
TCR-05	Pilo	M	SA	3	9-Jun-11	Present	99	42	141
TPH-05	Getty	F	SA	7	1-Sep-11	Present	356	156	512
TOTAL				51			4813	823	5688

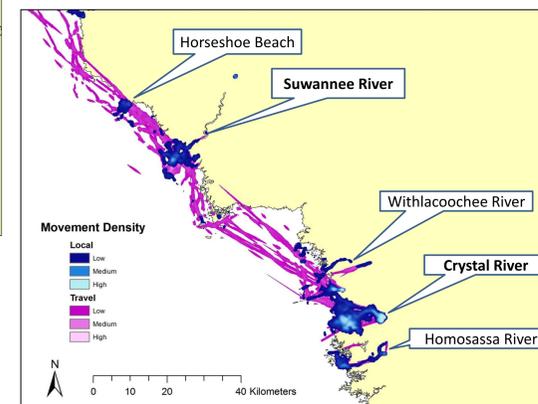
Data (including days tagged/tracked) are calculated through 10/28/2011
Size Classes - SU=sub-adult, SA=small adult, MA=medium adult, LA=large adult



Travel paths/local movements - GPS data from all individuals was used to display slower local movements (0-1 km/hr between points) and faster travelling moves (> 2 km/hr) with a kernel line density function displaying only multiple-use paths.



Spring and fall migration timing and paths for tagged manatees traveling from/to Crystal River varied by individual, but typically included foraging and freshwater resources of coastal creeks and rivers (Suwannee, Steinhatchee, Fenholloway, and Aucilla rivers).



Migrations to warm water refuges at Wakulla Spring and Crystal River were primarily triggered by the onset of early winter cold weather, although we also documented mid-winter migrations south from Wakulla.



From late spring through fall, manatee use focused primarily on the coastal estuaries and rivers from the Aucilla River to Apalachicola, with the greatest concentration of use at the Wakulla/St Marks rivers and Apalachicola/East bays.



Tracking data revealed the use of salt marshes and estuarine/marine seagrass beds that provide ample forage along the Big Bend coast, with abundant freshwater vegetation also accessed within the lower reaches of coastal rivers.

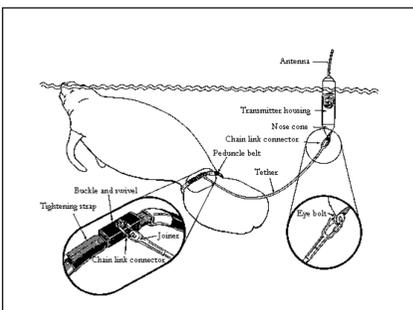


ACKNOWLEDGEMENTS

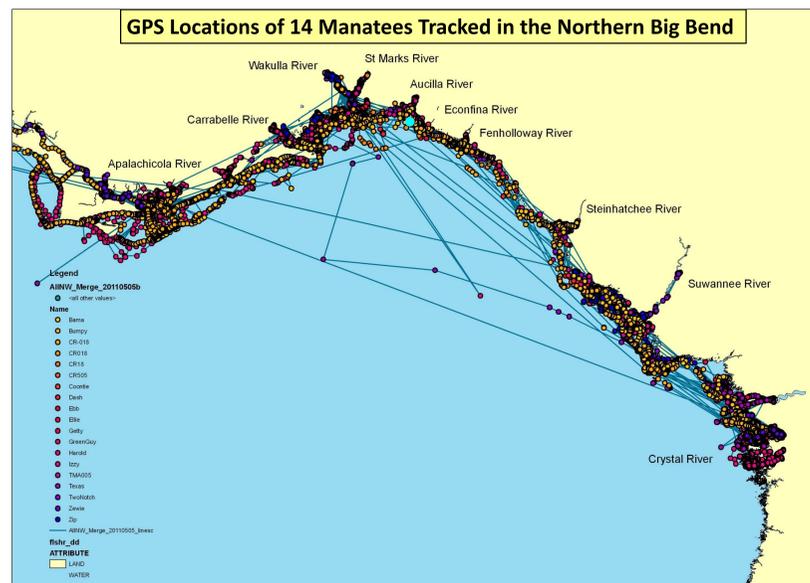
This project has benefited by the cooperative efforts of U.S. Geological Survey, Edward Ball Wakulla Springs State Park, FFWCC/ISM, FFWCC/FWRI, FFWCC LE/NW Region, Dauphin Island Sea Lab, Sea-To-Shore Alliance, St. Marks NWR, Crystal River NWR, and University of Florida. Significant logistic contributions were made by TNT Hideaway, Shell Island Fish Camp, Randall Pelt, and Shields Marina.

INTRODUCTION and METHODS

The Big Bend coast of northwest Florida has been acknowledged as the future last stronghold for manatees in peninsular Florida (Rathbun, et al., 1994). To better understand the current distribution of manatee resources and patterns of use in this region, we free-tagged individual manatees at the Wakulla River and selectively tagged individuals at Crystal River having known sightings in the northern Gulf, with Argos-linked GPS tags.



GPS receivers coupled with Argos satellite transmitters, encased in floating tethered housings, provided accurate locations (programmed to fix a GPS location every 30 minutes) and enabled us to remotely monitor detailed movements of tagged individuals.



Fourteen manatees generated 104,565 GPS locations during the study period (mean 7,469 locations/individual). The Big Bend of peninsular Florida contains valuable resources for manatees. Understanding the distribution of resources and patterns of use in this area will be valuable for managing the increasingly large numbers of manatees utilizing the northern extent of their Gulf coast range.

