

Product Announcement

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USGS Releases Population Model for Florida Manatees

The U.S. Geological Survey (USGS) released today a report describing a core biological model (CBM) that can be used to forecast the population growth of the Florida subspecies of the West Indian manatee over time in four regions: the Upper St. Johns River, and the Northwest, Southwest, and Atlantic coasts. The model was developed in cooperation with scientists at the Florida Fish and Wildlife Conservation Commission's Fish and Wildlife Research Institute, and is meant to serve as a flexible tool for assessments that support state and federal decision-making.

The model includes recent understanding of manatee population dynamics and estimates of life-history parameters, as well as assumptions about the future state of the environment, said Dr. Michael Runge, the lead author on the report and a scientist at the USGS Patuxent Wildlife Research Center in Laurel, Md. The model can also include annual variation in manatee survival and reproduction rates, effects of predicted changes in warm-water capacity, and catastrophes such as red tide.

By building on past published modeling efforts for manatees and incorporating new modeling methods, the CBM can provide assessment capability for manatees that was not available previously. The model can be used to make prospective projections of population growth under different management scenarios, and is designed to estimate extinction probability and related metrics useful for decision-makers and resource managers.

Some management agencies, such as the state of Florida and the U.S. Fish and Wildlife Service, use a risk analysis approach to decision-making about endangered species, and the CBM is able to provide results that aid such decision-making. The state of Florida and the International Union for Conservation of Nature and Natural Resources classify threatened and endangered species based on a number of criteria, including the likelihood of population declines of various magnitudes over specified time frames such as animal generations. The state of Florida used the CBM in its 2006 biological status review; this USGS report is based on parameter estimates available at the time of that review.

“The current population size of more than 3,000 animals and the long life of manatees provide a considerable buffer against threats, as does the strength of growth in two regions, the Northwest and the Upper St. Johns, where natural warm-water springs are abundant,” said Runge. “Statewide, the probability that the manatee population will drop below 1,000 manatees is low (around 2.3 percent) over 100 years.”

“However, under recent levels of threats, including the anticipated loss of warm-water capacity,” Runge said, “the CBM showed there is a high probability of a significant reduction in population size in the two regions that now support the most manatees, the Atlantic and Southwest.” Manatees in these two regions rely on industrial warm-water sources from power plants during winter cold periods, and because of technological changes these warm-water sources could disappear in the next 20-40 years.

The model is designed to evolve over time. As new field data become available and the model is updated, the results from the model may change to reflect an improved understanding of manatee dynamics. The CBM is also being used in other state and federal assessments, and USGS notes that it will be useful in future assessments as it is updated with new information and customized to address new questions.

USGS Open-File Report 2007-1082, “A core stochastic population projection model for Florida manatees (*Trichechus manatus latirostris*),” is available at (<http://www.pwrc.usgs.gov/resshow/manatee/>). The report’s authors are Michael C. Runge (USGS Patuxent Wildlife Research Center), Carol Sanders-Reed (IAP World Services, USGS Patuxent Wildlife Research Center) and Christopher Fonnesebeck (Florida Fish and Wildlife Conservation Commission, Fish and Wildlife Research Institute).

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