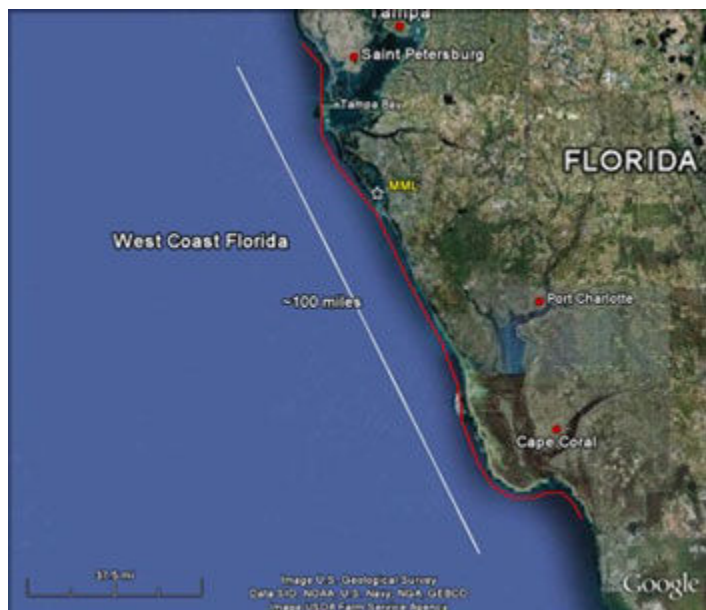


Shedding New Light on Sharks, Skates and Rays Aerial View Fosters Undersea Research



LightHawk flights are helping scientists fill in the blanks about charismatic species such as the spotted eagle ray. Photo: Wikimedia Commons

*For as much as we know about *Canis familiaris*, the family dog, it would come as quite a shock to discover that when we sleep, instead of curling up at our feet as we assume, they crack the spine of some weighty tome and open a nice Barolo for the night. As ardent conservationists, we are often surprised by how little is known about certain species seemingly familiar to us. Take, for example, sharks and rays. Few marine animals readily capture the public imagination as fully as these two species groups. Their sleek physical appearance, effortless motion in water, and the sense of excitement their presence engenders fascinates us. Yet what we do not know about these charismatic animals could fill a book.*



Flight path of monthly aerial survey flights that are donated to Mote Marine Laboratory giving researchers a more complete understanding of shark, ray and dolphin species. Map: Google Maps

While scientists know that sharks and rays play critical roles in the marine environment worldwide, there is much we don't know. What are their habitat needs? Where and when do they migrate from one area to another? When does cupid strike and what catches their eye? We also know little about the complex prey-predator relationships that, when in balance, secure healthy fish and shellfish populations, nurture estuaries and seagrasses, and protect coastal and deep water reef systems.

Flights Fill the Gap

Along with the scientists at Mote Marine Laboratory's Center for Shark Research (CSR), LightHawk is helping to answer these questions. Mote scientists rely on LightHawk flights to ensure they have every angle of their research covered. Based in Sarasota, Florida, Mote was founded in 1955 and is today one of the world's few independent marine research laboratories. Two years after LightHawk began providing donated flights in 2007, the two groups formalized their relationship to maximize the benefit of aerial resources in marine conservation.



An aggregation of more than 1,200 cownose rays are spotted during a regular LightHawk survey flight. *Photo: Jack Morris/Mote Marine Laboratory with aerial support by LightHawk*



Spotted eagle rays frequent shallow inshore waters such as bays and inlets. They sometimes leap out of the water when pursued. *Photo courtesy of Wikimedia Commons*

Mote is building a knowledge base about sharks and rays on multiple levels. One of the ways they do this is by capturing and sampling the seasonal population of spotted eagle rays (*Aetobatus narinari*) passing by the main laboratory in Sarasota, Florida. In 2009, 85 spotted eagle rays were tagged, weighed, and had genetic samples taken. In 2010, 145 spotted rays were sampled. Of those captured in 2009, five were recaptured the next year suggesting these animals may return to their birth areas year after year – a potentially critical piece of knowledge for effective management and conservation. While valuable, such techniques are limited by their small geographic scope, are labor intensive, costly, and require handling and some disturbance of the animals. LightHawk aerial surveys allow Mote researchers to extend these micro-studies and place them on a larger conceptual map. Over time, this map will enhance the conservation of spotted eagle rays and the other rays, sharks, skates and marine species that make up this fascinating, watery ecosystem.

Volunteer pilots Tuck Colby (Sarasota, FL), Kelly Gottlieb (Manapan, FL), Bruce Huester (Jensen Beach, FL), Alan Kinback (Juno Beach, FL) and Bruce McGregor (Ocala, FL) have donated more than 2,000 nautical miles of regular aerial survey flights to Mote since 2007. "We really enjoy our flights with Alan [Kinback]," says Mote Senior Biologist Jack Morris, "Once I heard he was a commercial airline pilot and flew jets for the Air Force, he had my confidence. But prior to meeting him I expected a larger than life personality. He could not be any further from that. He has a calm, cool and collected demeanor that makes you feel very comfortable."

Dark Shapes in the Water

LightHawk's monthly aerial surveys are designed by CSR staff to efficiently document the presence of marine animals in local Gulf coastal waters and inlets. Each flight covers an area of ~100 nautical miles from John's Pass in St. Petersburg to Sanibel Island in Fort Myers, Florida. Leaving from Sarasota airport, the planes travel up the coast to John's Pass then turns around to fly along the coast ~ 300 yards from shore (see map on left). Two researchers seated on either side of the plane scan the waters for the dark shapes of sharks, skates, rays, and other marine animals passing below them. Photos taken during the flight provide a record of the species and number of individuals observed while GPS location, time, and relevant comments are noted as well. This information augments the extensive CSR database and is used to determine migration patterns, habitat preferences, and populations, and to inform management and policy approaches at the local and global level.

By the Numbers:

LightHawk has cumulatively flown over 2,000 nautical miles – more than flying from Miami to New York City and back again - along a regular survey path on the central Gulf coast with scientists carefully spotting and recording everything they observe.

The count so far: 16,846 cownose rays (*Rhinoptera bonasus*), 2,648 tarpon (*Megalops atlanticus*), 922 spotted eagle rays (*Aetobatus narinari*), 754 sharks, 584 dolphins, 331 manatees (*Trichechus manatus*), 96 turtles and 16 unknown ray species.

“The most abundant have been the cownose rays that are observed in large migrating aggregations in the bay and along the coast”, notes Senior Biologist Jack Morris. “This is not a surprise as these large groups have been observed during field sampling surveys by boat – *although the ability to capture actual numbers is really only possible from the air.*”

According to Morris, the most interesting recent observation has been the spotted eagle rays (*Aetobatus narinari*) – a focal species for the Mote-LightHawk partnership. Spotted eagle rays are a species frequently found in tropical and sub-tropical oceans around the world, including coastal waters of Florida. Its unusual spots and attractive coloration pattern make it a sought after and popular display species for aquariums. The species also faces loss of habitat, the effects of a changing climate, and other man-made pressures. This combination of pressures, along with a dearth of knowledge on how they impact spotted eagle rays, led to the spotted eagle ray being listed as a “Near Threatened” species. Now the species is protected by laws and regulations restricting their collection. Learning more about this species, and the ecosystems on which they depend, is critical to protecting the spotted rays and keeping them from slipping away. The aerial perspective ensures that a more complete picture of these familiar, yet mysterious creatures is available to scientists seeking to understand and protect them.

About LightHawk

What started in 1979 with one man and a vision has grown to over 185 volunteer pilots flying missions across the U.S., into Canada, through Mexico and down to Panama. Today, LightHawk is the oldest and largest nonprofit, volunteer pilot-based organization flying environmental missions in collaboration with hundreds of partner organizations.

At LightHawk we believe the view from the window of a small airplane provides a powerful and effective platform for research, ground-truthing, environmental awareness, and education.

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