

## CARIB Tails: Research and Monitoring

# Identifying Individual Humpback Whales

### Who's Who?

Two techniques, photo-identification and genetics, are used to identify and catalog individual humpback whales and link them to specific breeding and feeding areas.

### Photo-Identification

Humpback whales have patterns of black and white pigmentation and scars on the underside of their tails that are unique to each whale, just as fingerprints are to humans. Researchers document the marks on the right and left lobes of the tail, or flukes, and rate the percentage of dark versus light skin pigmentation from 100 percent white to 100 percent black.

For scientific purposes, each humpback whale sighted in the North Atlantic is assigned a catalog number. Information collected for humpbacks in the Stellwagen Bank National Marine Sanctuary (U.S. Gulf of Maine) constitutes one of the longest and most detailed data sets for baleen whales in the world. Photographs in the Gulf of Maine Humpback Whale Catalog (maintained by the Provincetown Center for Coastal Studies) and the North Atlantic Humpback Whale Catalog (maintained by the College of the Atlantic in Bar Harbor, Maine) allow scientists and naturalists to identify and monitor individual animals, and gather valuable information about population sizes, migration, health, sexual maturity and behavior patterns.

Photographing individual whales and their calves each year helps to identify family relationships. Four generations of humpback whales have been documented in certain maternal lines, or "matrilines."

The unique scarring and patterns provide the inspiration for common names. For Gulf of Maine humpbacks, researchers and naturalists work together each year to name new adult whales and young animals sighted in a second year. New calves are not named because their coloring and scarring often change dramatically during that first year.



Pigmentation and scarring patterns on the tail flukes provide ways of identifying individual humpback whales. The top image shows Echo (note marks on left fluke) and the bottom whale was named Nile for the mark resembling a river delta (also on her left fluke).

The most famous Stellwagen Bank sanctuary whale is "Salt," the first humpback whale to be given a name along with another female named Pepper. She is known as the matriarch of the sanctuary and the "Grand Dame of Stellwagen Bank" because she has been seen here in all but one summer since 1976. She was also the first humpback whale to be identified by researchers on Silver Bank off the Dominican Republic. Those photos helped scientists confirm the migratory route that links northern feeding grounds with southern breeding grounds.

### Genetics

Another way to identify individual whales and confirm family relationships is through DNA analysis. Genetic data are generally obtained from skin samples. Pieces of naturally sloughed skin can sometimes be collected from the water after a whale has been active at the surface. More commonly, researchers shoot a small dart from a special crossbow at the whale's back. The biopsy dart takes a small plug of skin and blubber before bouncing off into the water. Back in the laboratory, DNA extracted from the sample can provide answers to questions about the sex of the individual whale, population structure, evolutionary history, paternity of offspring and social relationships.

# Salt's Family Tree

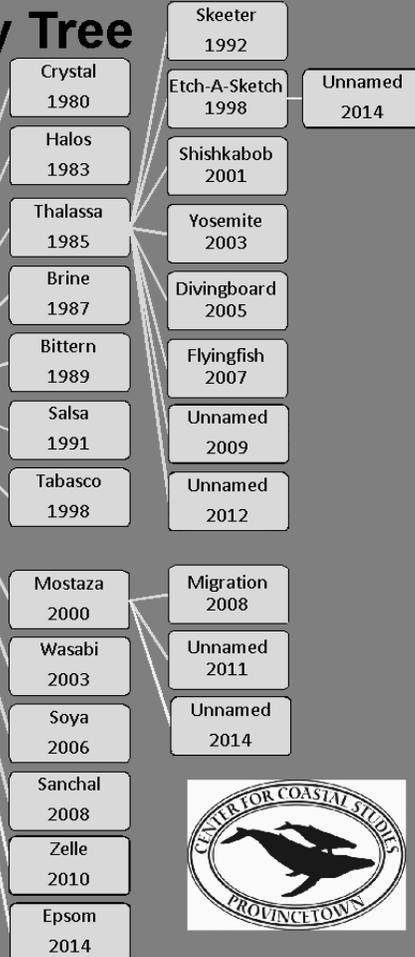
Salt is one of the most well-known humpback whales in the world. She has been studied by CCS since the mid-1970s.



Whales like Salt are not only well-loved by whale watchers but also key to our understanding of humpback whale biology, ecology and threats.



Salt was named for the white scarring on her dorsal fin



Salt's Family Tree

## The Truth From Tails

Salt is a great-grandmother. Since 1976 she has escorted 13 of her calves from the mating and calving grounds in the Caribbean back to New England's feeding grounds. She currently has 11 grandchildren, and one great-grandchild, representing the fourth generation of humpbacks in her family group. By recognizing and studying Salt and her family, we can begin to understand the lives of humpback whales and answer important questions.



Scientists follow a tagged whale until the tag detaches.

## Follow That Whale

The ability to identify individual whales can be critically important during research projects. When attaching a data-recording device, scientists like to know as much about the tagged animal as possible. By knowing who the animal is, scientists may be able to find out about its age, sex and past associations with other whales. The whale can be recognized, even when in a group, and followed until the tag detaches. In some cases, whales have been tagged multiple times, giving scientists the opportunity to study the animal in different years, times of the day, and locations.

## 2009 Tagged Humpbacks

Draco  
Entropy  
Fern  
Fern's calf  
Glo-Stick  
Jabiru  
Lavalier  
Lavalier's calf  
Milkyway  
Samovar  
Solas  
Tripod  
Upsilon  
Valley



Draco



Glo-Stick

### What is the age of the animal?

Salt was first seen in 1976 and she was an adult at that time, so she was at least 4-6 years old. In 2016, she would be at least 40.

### When is a humpback whale sexually mature?

We know that Thalassa was born in 1985 and she had her first calf (at least the first that we know of) in 1992. Gestation is about one year. Other mothers in our population have had calves at even younger ages. Our conclusion is that humpback whales probably reach sexual maturity within the span of ages four to six.

### What is the calving interval for humpbacks (how many years between births)?

In looking at Salt and Thalassa, we see a general calving interval of two or three years.

Whale photos taken under NOAA Fisheries Permits #605-1904 and #775-1875 or under NOAA Northeast Regional Whale Watching Guidelines.

<http://stellwagen.noaa.gov>