

The Spring of Life

A PAINTING BY CHRISTOPHER M. STILL

OIL ON LINEN, 158.25" BY 56"

The past and the future of Florida are gathered together in her beautiful springs. Throughout much of the state, crystal clear waters well up from the earth, collecting and scattering light like azure diamonds. But far more valuable a treasure than gemstones, the springs create and sustain life—in an ecosystem unlike any other.

Florida's springs discharge 19 billion gallons of groundwater each day—more than any other place in the world. They form and support systems of rivers that flow to the sea. Each winter as seawater cools, manatees and schools of fish travel up these rivers in an ancient ritual, seeking the constantly warm water of the springs. Fish from both saltwater and freshwater environments come together here, along with a myriad of creatures and plants, all vital to the chain of life.

The largest winter visitor is the Florida manatee. Though it may weigh thousands of pounds, this gentle mammal lacks sufficient fat to insulate itself when water temperatures drop below 68°. Its survival depends upon the 72° water of the springs. The manatee's prehistoric relatives found refuge in such warm freshwater basins millions of years ago.

A pure water drop that emerges from a spring is on an endless journey—falling from a cloud as rain, percolating through filtering sand and soil, coursing through the “swiss cheese” structure of limestone that makes

up the Floridan Aquifer—until it exits at last from a cave that has opened to the surface. This part of its journey could take twenty years. From there it may travel on to the sea, evaporate, or transpire from the leaves of a plant, becoming part of a cloud and falling again.

There are no new drops of water—only the same resource returning to the earth again and again through the water cycle. The same water that flows from the springs today inspired awe and worship in the state's earliest inhabitants. They frequented these lush pools of life, as evidenced by the fossilized bones of the animals they hunted. The same water also enticed thousands of people to visit Florida's

health spas in the early 1900s—the state's first tourist attractions.

The same life-giving spring water still attracts today—but now must support and sustain a large and ever-increasing human population along with the plant and animal life it gave birth to. Studying the human impact on the health of Florida's precious springs, and finding ways to protect them and the land areas that recharge them, are important missions of the Department of Environmental Protection, initially funded by the 2001 Florida Legislature.

All parts of the cycle of life sustain one another. As Florida moves into a new age, the challenge of protecting its ancient springs is key to our future.



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In this painting, the artist binds the future with the past by combining elements from the ancient and contemporary paintings, creating a circle with no beginning or end in the mural series. Fish from *In Ages Past* and *A New Age* are found gathering in this unique spring environment, where both saltwater and freshwater fish can be found—leaving what is above water to the viewer’s imagination.

Close inspection will reveal a reflection of the House Chambers in the eye of the large manatee.

1) Florida Manatee. Christopher Columbus took note of a less-than-attractive “mermaid” in the Caribbean in 1493. What he saw was actually a manatee—a large, gentle marine mammal that feeds primarily on sea grasses, earning it the nickname “sea cow.” Fossilized remains of the manatee date back 30 million years.

Growing up to twelve feet in length and weighing as much as 3,500 pounds, Florida manatees live in both salt and fresh waters, but require temperatures above 68° to maintain their slow metabolisms. In winter months they seek out the warm waters of Florida’s natural springs and the effluents from coastal power plants. The manatee is Florida’s State Marine Mammal.

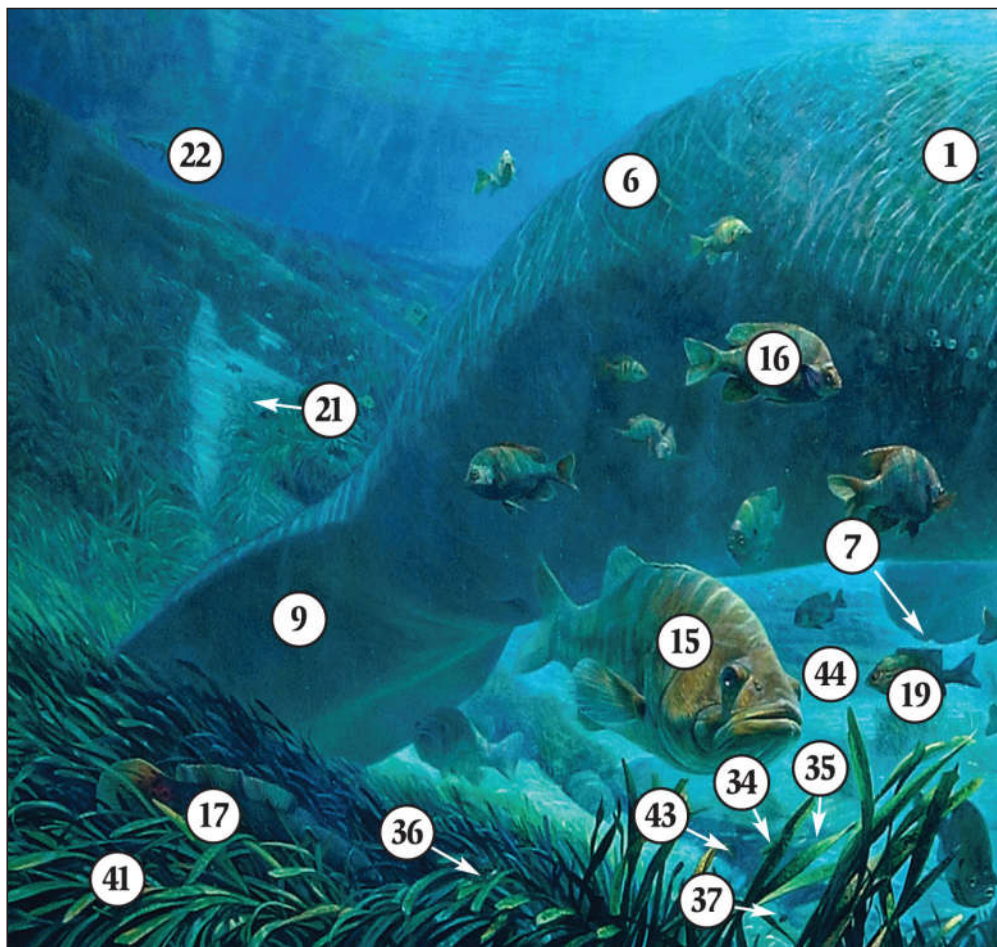
2) Eyes. The manatee has small eyes encircled by sphincter muscles. It lacks eyelids, but can still blink and draw a translucent membrane across the eye as protection. Its sight is believed to be somewhat poor, and it may rely more on hearing and sense of touch through its sensitive hairs. The House Chambers are reflected in this manatee’s eye.

3) Ears. This small pinhole is the manatee’s ear canal. Unlike most other mammals, it has no external ear flaps.

The inner ear bone is used to determine the age of a deceased manatee. In cross section, stains reveal growth rings in the bone. In most mammals, age can be estimated using teeth, but a manatee’s teeth are continuously replaced throughout its lifetime.

4) Mammary Gland. The female manatee’s mammary glands are located in the area behind its forelimbs.

5) “H” Brand. The first manatee to be freeze branded in Florida was marked with a letter “H” and released on the east coast in July 1976. Since then, over 100 manatees have been given freeze brands for identification purposes.



The “H” is also the artist’s symbol for Dr. Daniel Hartman, whose groundbreaking research on the Florida manatee in the late 1960s sparked national interest that contributed to conservation efforts on its behalf, and led to its listing as an endangered species in 1972.

6) Propeller Scars. Their slow movement, feeding habits and preferred habitat often cause manatees to be run over by motorized boats. Many die each year from injuries received in such encounters, but a strong immune system enables others to recover. The unique pattern of propeller scars borne by a majority of adult manatees are a means used by scientists to identify and track individuals.

7) “Cookie Cut.” Robert Bonde began a program for The U.S. Geological Survey’s Sirenia Project that entails removing a tiny piece of the tail of a manatee calf to obtain genetic material. The placement of the “cookie cut” provides a simple visual clue for the scientist as to the year the calf was tagged.

8) Flipper. Although the manatee uses them for steering and positioning, its flippers are unusual in that they each contain five finger bones, as well as a wrist, forearm, and upper arm bone—similar to humans and other land mammals. These features give the manatee considerable dexterity and ability to manipulate, gather, and hold its food or other objects.

Although it may at first glance seem to most resemble a whale or seal, manatee features such as “toenails” at the end of the flipper and rough, thick skin are more similar to a closer relative, the elephant.

9) Fluke. The manatee lacks hind legs. It uses its broad, flat tail, called a fluke, to propel it through the water.

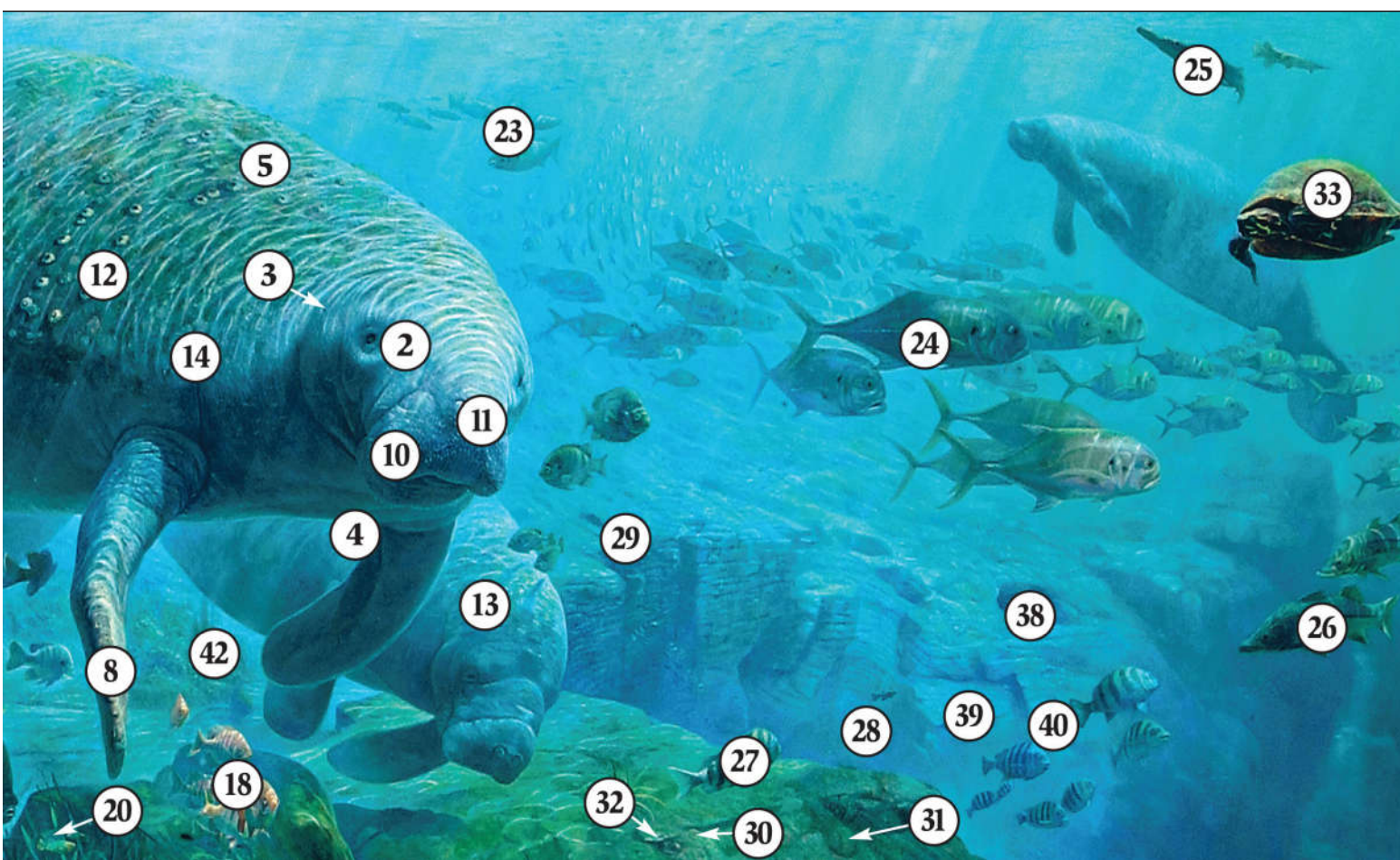
10) Vibrissae. Whiskers similar to those on cats and dogs, the manatee’s vibrissae serve to manipulate food and as sensory organs, providing information about its environment.

11) Nostrils. Small flaps of skin keep water from entering the manatee’s respiratory system when it submerges.

12) Barnacles and Map of Florida. Barnacles settle and grow on the rough skin of the slow moving manatees while they are in saltwater. The barnacles die after a move into freshwater, but remain rooted in the skin’s layers. Eventually the barnacle shell falls off, leaving a scar. The species of barnacle shown here grows solely on manatees.

A map of Florida is formed by barnacles in the painting. Some are highlighted to show warm water locations where manatees congregate during winter months. Many of these locations are power plant outflows.

13) Manatee calf. Manatees generally give birth to only one calf every two to five years. The female manatee bonds very closely with its calf, nursing and



protecting it for up to two and a half years.

14) Skin. The skin of a manatee is rough and heavy. This, along with the dense structure of its bones, contributes to its negative buoyancy. Using its weight and compressing air in its lungs, a manatee can submerge easily with a full breath.

15) Largemouth Bass. This popular freshwater game fish lives in the protective cover of vegetation where its food is plentiful. During breeding season, the male largemouth fans out a nest in sand or silt for females to deposit their eggs. The male defends its nest aggressively throughout incubation and for some time after its young emerge.

16) Bluegill. The bluegill is a common freshwater fish in quiet, weedy waters. It varies in color considerably. Adults develop deep purple coloration around the eyes and gills.

17) Bowfin. This primitive fish is the only remaining member of its family. Fossil remains of its ancestors are millions of years old. Like the alligator gar, the bowfin has an air bladder connected to its throat allowing it to breathe in air and survive in stagnant water. Bowfins and gars can often be seen rising to the surface to supplement the oxygen taken in through their gills.

18) Juvenile Bluegills. Young bluegills form groups and feed close to shore.

19) Redbreast Sunfish. Quick and curious, this beautifully colored sunfish is not afraid to approach a swimmer in the springs. It lifts its dorsal fin defensively to make itself appear larger and more difficult to swallow.

20) Sailfin Molly. This is a small livebearing fish, often bred for aquariums as a "Mollie." The male displays its high, colorful dorsal fin to attract a mate or fend off other males.

21) Chain Pickerel. Well camouflaged, this solitary fish lurks in the weeds and strikes passing fish or other prey.

22) Alligator. Florida's well known reptile also calls the springs its home. This alligator represents a submerged view of the one portrayed in *The Okeehumkee on the Oklawaha*.

23) Mullet. Species of mullet can be found in any body of freshwater that has access to the sea. They are often seen habitually leaping from the water. They are vegetarians and have a unique feature among fish, a gizzard much like a chicken's. Florida lore tells of a fisherman in the 1920s who escaped penalty for catching mullet out of season when the judge accepted his lawyer's argument that only birds have a gizzard.

24) Jack Crevalle. These large fish are strong, fast swimmers with silvery smooth skin that reflects beautiful iridescent colors.

25) Alligator Gar. Characterized by its elongated body and snout, alligator gars have double rows of large, needlelike teeth. Newly hatched gar and bowfin fry have an adhesive pad on their snouts that attaches them to vegetation until their yolk sacs are absorbed. The young feed on insects, growing rapidly until they are large enough to eat other fish. The largest species of gar, they often grow to 100 pounds or more.

26) Snook. Known as a tasty food fish and popular game fish, snook are sensitive to cold water temperatures and seek the warmth of spring water in the winter. They have razor sharp gill plates and must be handled carefully by anglers.

27) Sheepshead. Vertical bars give the sheepshead a common name of "convict fish." Its strong jaw and sharp incisor teeth enable it to feed on crustaceans, mollusks, and barnacles. When scraping barnacles from a manatee, the sheepshead can create painful wounds.

28) Catfish. A variety of catfish make the springs their home. Most are nocturnal, leaving cave openings at night to feed.

29) Gray Snapper. Gray snappers, also known as "mangrove snappers," cluster in the shadows of cave openings or niches in the rocky cliff faces of the springs. They are known to be cunning and difficult to catch on a line.

(Continued on the next page)

- 30) Tadpole Madtom.** This tiny catfish hides beneath stones and rocks, rarely appearing in daylight. It has a poison gland in its pectoral fin and can produce a painful wound.
- 31) Applesnail.** Clusters of eggs from this large freshwater snail can be seen at the base of cypress trees or on the stalks of river plants.
- 32) Crayfish and Arrowhead.** The crayfish, a small lobster-like crustacean, is abundant in springs. It emerges mainly at night to feed. The painting shows one by his burrow beneath an old arrow point.
- 33) Peninsula Cooter.** These fast-swimming turtles are often seen sunning along the edges of rivers and springs in Florida.
- 34) Dragonfly Nymph.** The larva of a damer dragonfly propels itself with jets of water. It preys on small insects, tadpoles, and the larvae of other insects until it's ready to emerge from the water, shed its skin, and take flight as an adult.
- 35) EPT Index.** Because concentrations of pollutants vary greatly with time and location, random physical and chemical monitoring of quality often do not portray the true health of a body of water. The EPT Index is a biological system of water quality monitoring that measures the numbers and balance of three aquatic insect larvae (Ephemeroptera or mayflies, Plecoptera or stoneflies, and Trichoptera or caddisflies) that are sensitive to pollutants.
- Ephemeroptera, Mayflies.** The mayfly is one of the most common and important stream insects. It spends most of its life in the water as a nymph—the adult may live only 24 hours, its sole purpose to mate and lay eggs. Mayflies are an important food source for fish and other aquatic insects.
- Trichoptera, Caddisflies.** Two varieties of this insect are shown on the eel grass. One builds a silk purse case, and the other builds a log cabin case out of tiny sticks.
- Midges.** The larvae of midges live in water and are commonly found attached to eel grass. There are over 500 known species of these insects and each has a unique way of capturing food. The type shown here, *Rheotanytarsus pellucidus*, spins its silk together with detritus and makes a tube to live in. A net at the end of the tube traps food as it floats by, and also helps filter the water. A recently discovered species of midge larva lives in Hydrilla, and may be used to control this exotic plant species in the future.
- 36) Giant Water Bug.** One of the largest insects to live underwater, a giant water bug preys on minnows, tadpoles, or other insects. The female attaches her eggs to the back of the male, where they will remain until hatching.
- 37) Diving Beetle.** This predacious beetle stores a bubble of air under its wings to prolong its time under the water.
- 38) Mastodon Jaw.** Many fossilized bones from the great mammal, the mastodon, have been recovered from Florida's springs. Some bear the butcher marks of early inhabitants. The mastodon jaw is a symbol of the Pleistocene epoch, from over a million years ago to nearly 10,000 years ago.
- 39) Parahippus "Horse" Skeleton.** The fossilized skeleton of this small prehistoric horse represents the upper Tertiary period, Miocene epoch, 24 to 17 million years ago.
- 40) Sirenian Rib and Vertebra.** These fossils from ancient ancestors of the Florida manatee date from the Eocene epoch, 57 to 36 million years ago when Florida was largely submerged. "Eocene" comes from the Greek word "eos" which means "dawn."
- 41) Eel Grass.** A common rooted plant in spring runs, eel grass oxygenates the water and provides habitat for many kinds of aquatic organisms.
- 42) Coon's Tail.** Also known by the common name of "hornwort," this native aquatic herb is a good oxygenator and tolerates nutrient-rich water and fluctuating water levels. It offers nesting protection for a variety of insects, fish, and snails.
- 43) Spring Opening.** Fine white sand and pieces of fossil shell sparkle as they are tossed by the current at the vent of a new spring opening.
- 44) Dugout canoe.** The front of a dugout canoe can be seen resting on the river bottom.

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