As part of the Professional Development Workshop at Calhoun Community College, the Department of Natural Sciences conducted the third annual Spring Wilderness Pilgrimage in March 1989, a week-long environmental awareness field trip for faculty and staff. Designed as a study of the plants and animals on a barrier island off the coast of Florida, the trip included nature hikes, a shrimp feast, photomicroscopy of marine life, mollusk identification, seashell collecting, and leisure time on the beach. This guidebook, for use by field trip participants, provides information on the flora and fauna studied during the trip, and includes background information, maps, tide charts, and other reference materials. The guide includes the following components: an article describing typical encounters and experiences on Dog Island; a map outlining the travel route of the group; a detail map of the island; an itinerary of activities; a list of group participants; tide tables and geographical coordinates; and lists of visible astronomical phenomenon, birds, mollusks, and plants. The section on mollusks discusses shell identification, classification keys for shell families, shell tips, live clam observation, and mussel (clam) dissection. An extensive section on plants, provides a key to Dog Island plants, a checklist of common plants on the island, and divisions of plants by species, type, distinctive features, flowering season, and habitat. The guide concludes with references and a passage from Oliver Wendell Holmes's poem "The Chambered Nautilus." (JMC)
Barrier Island Ecology

A Professional Development activity for faculty and staff of
Calhoun Community College

March 7-12, 1989
on
Dog Island, Florida

Field Trip Reference Booklet

A combined effort by:
Don Collier
Bettye Gregg
Donna Lee
George Williams

BEST COPY AVAILABLE
FORWARD

As each of you join this spring pilgrimage you are stepping from your everyday world onto the sand of the beach on Dog Island. May you find there rest and a renewed appreciation for the complex balance of our natural surroundings.

Included in the following pages is useful information for references on the local flora and fauna. Maps, time and tide charts are also included for your convenience. Use this information only as a base for new discoveries during this time of professional development.

Man was given responsibility for dominion over Nature. His place in the hierarchy of creation is referred to again and again in the Old Testament, but nowhere in more expressive terms than by David in the 8th Psalm:

"Thou madest him to have dominion over the works of thy hands; thou hast put all things under his feet: All sheep and oxen, yea, and the beasts of the field; The fowl of the air, and the fish of the sea, and whatsoever passeth through the paths of the seas!

Only by increased knowledge and awareness can we better accept this Divine responsibility."
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Article Titled
"The Long, Peaceful Days of Dog Island"
published by Southern Living, Inc., March, 1985, has been removed due to copyright restrictions.
Shell Collecting Tips

1. Have a large porous bag available for easy transport of lots of shells.
2. Carry a day pack with drinking water, camera, insect repellents, and reference book for long strolls.
3. DO NOT COLLECT LIVE SHELLS.
4. Nesting smaller shells in a large cockle protects the delicate treasures.
5. Later, place shells in zip lock bags for storage to avoid odor before further cleaning.
6. To preserve shells:
   - wash and boil univalves to remove microorganisms
   - remove barnicles after a short vinegar soak
     (muratic acid may also be used but use caution)
   - spray with polyurethane, if desired

The mountains

St. George Sound

(horse conchs)

Cannonball Pt.

Ballast Cove

Shipping Cove

cannonball narrows

tide flats (sand dollars)

(pen clams)

(caneel pines)

The west end

Gulf of Mexico

Hiking Trails
- Roads
- Shipwreck
- Marsh or Wetlands
ITINERARY, 1989

Professional Development Workshop

BARRIER ISLAND ECOLOGY

**Tues., March 7**
- 9:00 p.m. leave Calhoun

**Wed., March 8**
- 6:15 a.m. breakfast in Panacea
- 7:30 a.m. buy groceries
- 8:15 a.m. tour Gulf Specimen facilities
- 10:00 a.m. board ferry for island
- Afternoon free time
- 8:00 p.m. orientation

**Thurs., March 9**
- 8:00 a.m. shell identification and mollusk dissection
- Afternoon individual projects
- 6:00 p.m. bring your steak and plate

**Fri., March 10**
- Morning and Afternoon activities to be announced
- 6:00 p.m. shrimp feast
- photo developing

**Sat., March 11**
- Morning free time
- 12:00 noon gear in rooms 3 an’ 4
- 3:00 p.m. leave for ferry ride
- 8:30 p.m. dinner in Marianna

**Sun., March 12**
- 2:00 a.m. arrive at Calhoun Community College
List of Participants 1989

Lauri Burgreen
Charles Gober
Elaine Lauderdale
Phillip Parker
Renee Wales

Sandra Caudle
Chris Hamilton
Mary Luna
Melvie Taylor
Patsy Bruce
Billie May

Staff:

Don Collier
Bettye Gregg
Donna Lee
Phillip Parker
George Williams

Emergency Phone Numbers:

(a) Preferred
Pelican Inn Office (daytime)
1-800-451-5294

(b) Alternate
Franklin County Sheriff
(904) 697-2113
(Specify Pelican Inn, Dog Island)

Staff checklist:

Walkie-talkie
Dissection Equipment
Photographic Equipment
Microscope
Telescope
Plant Press
Newspaper
Metric ruler
glass rod
small pipette
small aquarium
carousel projector
reference books
charcoal and lighter
seafood feast
The Pelican Inn coordinates are:
29 degrees, 48 min. N. - Latitude
84 degrees, 34 min. W. - Longitude

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<th>Long.</th>
<th>POSITION</th>
<th>DIFFERENCES</th>
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</table>
Basic Optical Astronomy for Dog Island Field Trip

I. Identification of Constellations with selected Stars:
1. Ursa major
2. Ursa minor, Polaris
3. Cassiopeia
4. Pegasus
5. Pisces
6. Andromeda
7. Taurus, Aldebaran
8. Auriga
9. Gemini, Castor and Pollux
10. Cancer
11. Orion, Betelgeuse, Bellatrix, Rigel, Saiph
12. Lepus
13. Canis Major, Sirius
14. Leo
15. Virgo, Spica
16. Bootes, Arcturus

II. Observation of Selected Messier Objects:
1. M31 Andromeda Galaxy
2. M42 Great Nebula in Orion
3. M44 Praesepe ("Beehive") Star Cluster in Cancer
4. M45 Pleiades Star Cluster

III. Observation of Planets:
1. Jupiter, Io, Europa, Ganymede, Callisto
2. Mars, Conjunction with Jupiter
3. Saturn
4. Uranus
5. Neptune
6. Venus

IV. Lunar Topography:
A. Lunar Maria
1. Grimaldi
2. Mare Nubium
3. Mare Imbrium
4. Mare Frigoris
5. Mare Serenitatis
6. Mare Tranquillitatis
7. Mare Nectaris
8. Mare Foecunditatis
9. Mare Crisium
B. Mountain ranges:
   2. Apennines
   3. Alps
   4. Caucasus
   5. Haemus Mts.
   6. Altai Mts.

C. Selected Lunar Craters:
   1. Tycho
   2. Schickard
   3. Ptolemy
   4. Kepler
   5. Copernicus
   6. Aristarchus
   7. Archimedes
   8. Aristillus
   9. Aristoteles
   10. Petavius

V. Astrophotography:
   1. Lunar photo
   2. Jupiter with Gallilean Satellites
   3. Saturn
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<td>Common Loon</td>
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<td>Pied-Billed Grebe</td>
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<td>Little Blue Heron</td>
<td>SR (YR?)</td>
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<td>Louisiana Heron</td>
<td>YR</td>
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<td>Cattle Egret</td>
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<td>WR (SR?)</td>
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<td>Snowy Egret</td>
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<td>Black-Crowned Night Heron</td>
<td>WR</td>
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<td>Yellow-Crowned Night Heron</td>
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<td>MIG</td>
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<td>Pintail</td>
<td>TR/MIG</td>
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<td>Gadwall</td>
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<td>Wood Duck</td>
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<td>31.</td>
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<td>32.</td>
<td>Lesser Scaup</td>
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<td>Buftledhead</td>
<td>WR</td>
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<td>34.</td>
<td>Hooded Merganser</td>
<td>WR</td>
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<td>Red-Breasted Merganser</td>
<td>WR</td>
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<td>36.</td>
<td>Turkey Vulture</td>
<td>TR/YR</td>
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<td>37.</td>
<td>Swallow-Tailed Kite</td>
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<td>Sharp-Skinned Hawk</td>
<td>MIG/WR</td>
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<td>Cooper's Hawk</td>
<td>MIG/TR</td>
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<td>40.</td>
<td>Marsh Hawk</td>
<td>MIG/WR</td>
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<td>Red-Tailed Hawk</td>
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<td>Rough-Legged Hawk</td>
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<td>Osprey</td>
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<td>Kestrel</td>
<td>WR</td>
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<td>Morlin</td>
<td>WR/MIG</td>
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<td>Peregrine Falcon</td>
<td>MIG/WR</td>
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<td>Virginia Rail</td>
<td>WR</td>
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<td>Clapper Rail</td>
<td>YR</td>
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<td>TR (?)</td>
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<td>58.</td>
<td>American Oystercatcher</td>
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<td>Sn. Plover</td>
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<td>Black Skimmer</td>
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<td>Whip-Poor-Will</td>
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<td>Belted Kingfish</td>
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<td>103.</td>
<td>Common Flicker</td>
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<td>104.</td>
<td>Red-Bellied Woodpecker</td>
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<td>105.</td>
<td>Red-Headed Woodpecker</td>
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<td>107.</td>
<td>Ladder-Backed Woodpecker</td>
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<td>Scissor-Tailed Flycatcher</td>
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<td>Western Kingbird</td>
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<td>111.</td>
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<td>Great Crested Flycatcher</td>
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<td>Blue-Gray Gnatcatcher</td>
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<td>148.</td>
<td>White-Eyed Vireo</td>
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<td>Common Yellowthroat</td>
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<td>Brown-Headed Cowbird</td>
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<td>Brewer's Blackbird</td>
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<td>Rufous-Sided Towhee</td>
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<td>Sharptailed Sparrow</td>
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<td>Wetland and Shore Birds on Dog Island</td>
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<td>Pied-Billed Grebe (2)</td>
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<td>Double-Crested Cormorant (4)</td>
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<td>Gt. Blue Heron (8)</td>
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<td>Little Blue Heron (9)</td>
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<td>Louisiana Heron (10)</td>
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<td>Cattle Egret (11)</td>
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<td>Reddish Egret (12)</td>
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<td>Great Egret (13)</td>
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<td>Snowy Egret (14)</td>
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<td>Black-Crowned Night Heron (15)</td>
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<td>Greater Scaup (31)</td>
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<td>Hooded Merganser (34)</td>
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<td>Red-tailed Hawk (41)</td>
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<td>American Coot (56)</td>
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<td>Semipalmated Plover (61)</td>
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<td>Dunlin (68)</td>
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<td>Least Sandpiper (70)</td>
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<td>Semipalmated Sandpiper (71)</td>
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<td>Greater Yellowlegs (72)</td>
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<td>Lesser Yellowlegs (73)</td>
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<td>39.</td>
<td>Spotted Sandpiper (74)</td>
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<td>40.</td>
<td>Common Snipe (75)</td>
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<td>41.</td>
<td>Short-Billed Dowitcher (76)</td>
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<td>42.</td>
<td>Willet (79)</td>
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<td>43.</td>
<td>Herring Gull (81)</td>
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<td>44.</td>
<td>Ring-Billed Gull (82)</td>
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<td>45.</td>
<td>Laughing Gull (83)</td>
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<td>46.</td>
<td>Royal Tern (85)</td>
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<td>47.</td>
<td>Caspian Tern (87)</td>
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<td>48.</td>
<td>Least Tern (89)</td>
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<td>49.</td>
<td>Forster's Tern (91)</td>
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<td>50.</td>
<td>Black Skimmer (92)</td>
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TWENTY-FIVE MOST LIKELY DOG ISLAND SHELL FAMILIES

BIVALVES (PELICYPods)

ARK shells: Family ARCIDAE
   TURKEY WING: Arca zebra
   BONDEROUS ARK: Noetia ponderosa
   RED-BROWN ARK: Barbatia cancellaria
   INCONGRUOUS ARK: Anadara brasiliana
   CUT-RIBBED ARK: A. floridana
   TRANSVERSE ARK: A. transversa

CARDITA shells: Family CARDITIDAE
   BROAD-RIBBED CARDITA: Carditamera floridana

COCKLE shells: Family CARDIIDAE
   GIANT ATLANTIC COCKLE: Dinocardium robustum
   ATLANTIC STRAWBERRY COCKLE: Americardia media
   COMMON EGG COCKLE: Laevicardium laevigatum
   PRICKLY COCKLE: Trachycardium egmontianum

COQUINA shells: Family DONACIDAE
   FLORIDA COQUINA: Donax variabilis

JINGLE shells: Family ANOMIIDAE
   ATLANTIC JINGLE: Anomia simplex

KITTEN'S PAW shells: Family Plicatulidae
   KITTEN'S PAW: Plicatula gibbosa

LUCINE shells: Family LUCINIDAE
   PENNSYLVANIA LUCINE: Lucina pensylvanica (Linga, Phacoideus)
   THICK LUCINE: Phacoideus pectinata (Linga, Lucina)
   TIGER LUCINE: Codakia orbicularis
   DENTATE LUCINE: Divaricella dentata

MUSSEL shells: Family MYTILIDAE
   TULIP MUSSEL: Modiolus americanus
   YELLOW MUSSEL: Brachiodontes citrinus
   SCORCHED MUSSEL: B. exustus

OYSTER shells: Family OSTREIDAE
   EASTERN OYSTER: Crassostrea virginica
   HORSE OYSTER: Ostrea equestris

PEN shells: Family PINNIDAE
   RIGID PEN SHELL: Atrina rigida
   AMBER PEN SHELL: Pinna carnea

SCALLOP shells: Family PECTINIDAE
   CALICI SCALLOP: Aequipecten gibbus (Argopecten)
   ATLANTIC BAY SCALLOP: A. irradians

SHELLCLAM shells: Family Mactridae
   ATLANTIC SURF CLAM: Spisula solidissima

TELLIN shells: Family Tellinidae
   SPECKLED TELLIN: Tellina listeri
   ALTERNATE TELLIN: T. alternata

VENUS CLAM shells: Family Veneridae
   SUNRAY VENUS: Macrotoma nimbosa
   SOUTHERN QUEAHOG: Mercenaria campechiensis
   KING VENUS: Chione paphia
   CROSS-BARRED VENUS: C. cancellata
   LIGHTNING VENUS: Pitar fulminata
   DISK DOSINIA: Dosinia discus
UNIVALVES (GASTROPODS)

AUGER shells: Family TEREBRIDAE
  ATLANTIC AUGER: Terebra dislocata

CONCH shells: Family STROMBIDAE (see also WHELK and TULIP)
  FLORIDA FIGHTING CONCH: Strombus alatus
  QUEEN CONCH: S. gigas

KEYHOLE LIMPET shells: Family FISSURELLIDAE
  LISTER'S KEYHOLE LIMPET: Biodora listeri
  CAYENNE KEYHOLE LIMPET: D. cayenensis
  KNOBBY KEYHOLE LIMPET: Fissurella nodosa
  BARBADOS KEYHOLE LIMPET: f. barbadensis
  SOWERBY'S KEYHOLE LIMPET: Lucapina sowerbii

MOON SNAIL shells: Family NATICIDAE
  ATLANTIC MOON SNAIL or SHARK EYE: Polinices duplicatus
  COMMON BABY'S EAR: Sinum perspectivum

MUREX shells: Family MURICIDAE
  GIANT ATLANTIC MUREX: Hurex fluvescens
  APPLE MUREX: H. Pomum
  PITTED MUREX: Favartia cellulosa
  ATLANTIC OYSTER DRILL: Urosalpinx cinerea
  FLORIDA DOG WINKLE or ROCK SNAIL: Thais floridana

NERITE shells: Family NERITIDAE
  TESSERATE NERITE: Nerita tessellata

PERIWINKLE shells: Family LITTORINIDAE
  COMMON PERIWINKLE: Nodilittorina tuberculata

SLIPPER shells: Family CALYPTRAEIDAE
  EASTERN WHITE SLIPPER: Crepidula plana
  COMMON ATLANTIC SLIPPER: C. fornicata
  WEST INDIAN CUP-AND-SAUCER: Crucibulum auricula

TULIP and HORSE CONCH shells: Family FASCIOLARIIDAE
  FLORIDA HORSE CONCH: Pleuroloca gigantea
  TRUE TULIP: Fasciolaria tulipa
  BANDED TULIP: F. hunteria

WHELK shells: Family MELONGENIDAE
  LIGHTNING WHELK: Busycon contrarium
  CHANNELED WHELK: B. canaliculatum
  PEAR WHELK: B. spiratum
  FLORIDA CROWN CONCH: Helongena corona

ALPHABETIC LISTING OF FAMILIES

Anomiidae (JINGLE)
Arcidae (ARK)
Calyptroidea (SLIPPER)
Cardiidae (OCKLE)
Carditidae (CARDITA)
Donacidae (COQUINA)
Faschiolaridae (HORSE CONCH and TULIP)
Fissurellidae (KEYHOLE LIMPET)
Littorinidae (PERIWINKLE)
Lucinidae (LUKINE)
Mactridae (SURF CLAM)
Melongenidae (WHELK and CROWN CONCH)

Muricidae (MUREX)
Mytilidae (MUSSEL)
Naticidae (MOON SNAIL)
Neritidae (NERITE)
Olividae (OLIVE)
Ostreidae (OYSTER)
Pectinidae (SCALLOP)
Pinnidae (PEN)
Plicatulidae (KITTEN'S PAW)
Stronbidae (CONCH)
Tellinidae (TELLIN)
Terebridae (AUGER)
Veneridae (VENUS CLAM/QUAHOG/DISK)
General Notes on Shell Identification

MOLLUSK means "soft bodied." Most have bony a exoskeleton called a "valve(s)." Some, such as octopi and nudibranchs do not. The soft parts of many mollusks (e.g. conchs, scallops, oysters, etc.) are edible. There are seven major groups of mollusks.

1. GASTROPODA. ("stomach-footed") 80% of all living mollusks are found in this group. They are univalves (having only one shell). The prettiest of these live in marine environments, but some of their cousins live in your backyard as snails or garden slugs.

2. PELECYPODS. ("hatchet-footed") This is the second largest group of mollusks. They are bivalves (having two parts to their shell). Some of the cousins to the marine bivalves live in your local rivers and ponds as mussels and freshwater clams.

3. POLYPLACOPHORA. ("many-plated") These mollusks have eight bony plates. E.g. chitons.

4. CEPHALOPODA. ("head-foot") E.g. octopi, squid.

5. SCAPHOPODA. ("boat-foot") E.g. tusk shells.

6. APLACOPHORA. ("no-plate bearers") E.g. deep sea worms.

7. MONOPLACOPHORA. ("one plate bearer") E.g. deep sea "living fossil" limpets.

Valves are formed by secretions from the mantle, so they often show concentric growth rings and/or ribs; but these are not necessarily annual. Note that some species have a very different juvenile form from the adult (e.g. the juvenile Queen Conch has no stromboid notch.) The adductor muscles leave scars inside the shell. The mantle leaves a pallial line where it was attached to the inside of the valve (sometimes with a depression or sinus.) The siphon may leave a canal where it extended from the valve(s). There may be evidence of the ligament that was used to open the valves. There may be teeth in the bivalve hinge. There may be remnants of the periostricum, the byssus. Note should be made of coloration. Shapes may vary (e.g. oblong, globose, orbicular, bubble-shaped, screw-shaped, fan-shaped.) There may be important structures such as an umbo, internal accessory plate, parietal shield, lanule, escutcheon, or beaks. Shells may be flattened or inflated. Lines may be concentric, radiating, vertical to axis, or cancellate. The shell may have spines, knobs, shoulders, beads, pits, or specs. Most of these descriptive terms have logical applications, and all may be significant in the discrimination of one species from another. It is not, however, necessary to memorize them. Most good shell references will have illustrated examples that can be easily referred to as you shell. H.ppy collecting!
CLASSIFICATION KEY TO BIVALVE (PELECYPOD) FAMILIES

1. Shell has hinge teeth that are numerous (taxodont) or absent (cryptodont)
2. Hinge teeth numerous, fine (ARK/ARCIDAE)
2. Hinge teeth absent
   3. Shell somewhat translucent, iridescent
   4. Shell long and pointed like Japanese fan (PEN/PINNIDAE)
   4. Shell not long and pointed
      5. Shell elliptical, elongate
      6. Beak on end of oval (MUSSEL/MYTILIDAE)
      6. Beak slightly off-center of oval (COQUINA/DONICIDAE)
   5. Shell globose
      6. Shell fragile, transparent (JINGLE/ANOMIADAE)
      6. Shell not fragile, transparent (DISK/VENERIDAE)
3. Shell not translucent
   4. Shell shaped like Shell Oil sign (globose, strongly ribbed) (SCALLOP/PECTINIDAE)
   4. Shell not shaped like Shell Oil sign (OYSTER/OSTREIDAE)
1. Shell with hinge teeth numbering 2-3 and clearly differentiated (heterodont)
2. Shell 1½" or smaller
   3. Shell shaped like a kitten's paw (KITTEN'S PAW/PLICATULIDAE)
   3. Shell not shaped like a kitten's paw
      4. Shell cancellate (ribs and concentric lines equally strong) (VENUS/VENERIDAE)
      4. Shell not cancellate
      5. Shell ribbed
      5. Shell strongly ribbed (CARDITA/CARDITIDAE)
      5. Shell weakly ribbed (THIN LUCINE/LUCINIDAE)
   5. Shell with concentric lines (PENNSYLVANIA LUCINE/LUCINIDAE)
2. Shell 1½" or larger
   3. Shell fragile with two tiny cardinal teeth (TELLIN/TELLINIDAE)
   3. Shell not fragile
      4. Shell strongly ribbed (COCKLE/CARDIIDAE)
      4. Shell not strongly ribbed
      5. Shell with spoon-shaped depression in hinge (chondrophore) (SURF CLAM/MACTRIDAE)
      5. Shell without chondrophore
      6. Shell with deep posterior furrow on outside (THICK LUCINE/LUCINIDAE)
      6. Shell without deep posterior furrow
      7. Shell elongate (SUNRAY VENUS/VENERIDAE)
      7. Shell globose (QUAHOG/VENERIDAE)
CLASSIFICATION KEY TO UNIVALVE (GASTROPOD) FAMILIES

1. Shell with top and bottom end both pointed
2. Shell 1" or less (top to bottom)
   3. Shell long, slender, screw-shaped (AUGER/TEREBRIDAE)
   3. Shell rounded
      4. Mouth rounded, untoothed (PERIWINKLE/LITTORINIDAE)
      4. Mouth oblong, toothed (OYSTER DRILL/MURICIDAE)

2. Shell 1" or more (top to bottom)
3. Shell pickle-shaped (OLIVE/OLIVIDAE)
3. Shell NOT pickle-shaped
   4. Shell with spines or 5-7 ribs
      5. Stromboid notch **absent in juvenile** (CONCH/STROMBIDAE)
      5. No stromboid notch
         6. Spines or ribs scattered from top to bottom of shell (MUREX/MURICIDAE)
         6. Spines just on shoulders (CROWN CONCH/MELONGENIDAE)
   4. Shell with no long spines or prominent ribs
      5. Mouth pink or pinkish brown
         6. Shell grayish (DOGWINKLE/MURICIDAE)
      6. Shell reddish brown (HORSE CONCH/FASCIOLARIIDAE)
      5. Mouth tan, brown, or gray
         6. Shell without squared shoulders (TULIP/FASCIOLARIIDAE)
         6. Shell with squared shoulders (WHELK/MELONGENIDAE)

1. Shell with only top or neither end pointed
2. Shell coiled like a garden snail
   3. Umbilicus present (MOON SNAIL/NATICIDAE)
   3. Umbilicus NOT present (NERITE/NERITIDAE)
2. Shell NOT coiled like a garden snail
   3. Internal shelly structures absent—shell coolie-hat shaped (KEYHOLE LIMPET/FISSURELLIDAE)
   3. Internal shelly structure present (SLIPPER/CALYPTRAEIDAE)
1. Ponderus Ark
   - black periostracum
   - straight line of teeth

3. Tellin
   - Double teeth

5. Surf Clam
   - depression (chondrophore)

7. Cardita
   - small valves with
     pronounced ribs

9. Oyster Drill
   - drills holes in oyster
     shell with teeth

11. Whelks
    - carnivorous
    - will feed on cockles

13. Tun
    - parietal shield not stipuled

2. Small Venus Clam
   - flat side of valve (escutcheon)
   - scoop (lanule)

4. Sun Ray Venus
   - show sun's rays

6. Thick Lucine
   - one groove

8. Quahog
   - heavy bivalve
   - Indian money
   - Used for clam chowder

10. Cockle
    - algae eater

12. Bonnet
    - goose pimpled (stipuled) parietal
      shield

14. True Conch
    - stromboid notch (may not be
      developed in juveniles.)
Live Clam Observation

Location

Clams are located in both fresh and salt water. They routinely exist partially or completely buried in the sand or mud. Freshwater clams have been found in rivers, lakes and streams in the Mississippi River valley, but pollution and acid rain are severely decreasing population counts. Marine species are also sensitive to chemical changes in their environment.

Ethology (Behavior)

Some mussels lie half buried in sand. Their reactions are slow and sluggish and therefore are available for ready observation. As the mollusk poses half buried at rest, the valves of the hard exoskeleton are slightly agape ventrally. One can observe the fringed edges of the mantle which line the valve. The posterior edges of the mantle form two openings, the incurrent and excurrent siphon, which allow for water movement into and out of the soft internal body parts as the organisms filter feeds. (See Fig. 1)

Observation Technique

Pipette a small amount of carmine dye near the siphons of a living clam. Note the movement of the dye into and out of the siphons. Gently touch the mantle of the mollusk with a glass rod. Note the organism's sensitivity not only to chemical stimulus but also to touch.

Some marine species have siphons drawn into a long tubular structure. When the organism is burrowed into the sand the siphon extends to the surface to bring water into the mantle cavity.

The foot is another observable structure of the mollusk. It is a soft, flexible and very sensitive organ covered with mucus glands for protection. If possible lift a clam from the sand to watch the quick withdrawal of the foot. Upon returning the clam on its side to the sand observe its efforts to right itself with the muscular foot.

![A half-buried bivalve with exposed filtering siphons](image-url)
Mussel (Clam) Dissection

The molluskan body is characterized by a ventral, muscular foot and a visceral mass enclosed in a thin tissue layer called the mantle, which usually secretes a calcareous shell. Modification of this basic organization has produced extreme variability among the mollusks. This phylum includes the chitons, tooth shells, snails, slugs, clams, mussels, octopi, and squids.

Exercise 2 Shell Features

A. External Figure 2

1. Examine the mussel in the dissecting pan and note the bivalve or 2-part shell.
2. Note the umbo or elevation toward the anterior end.
3. Determine the posterior and anterior ends. The more pointed end of the valves is the posterior or back end.
4. Determine the dorsal and ventral regions of your clam. The hinge ligament fastens the 2 shells together along the dorsal surface.
5. Feel the concentric growth rings radiating from the umbo.

B. Internal Shell Features Figure 3

1. Note the smooth pearly lining, the nacre.
2. Observe the mantle line. This is the point of attachment of the mantle to the valve.
3. The valves are held together by strong muscles. Note the large anterior adductor scar and posterior adductor scar.
4. Some mollusks are identified by characteristic "teeth" on the shell. Note the large cardinal teeth and smaller lateral teeth along the hinge.

The following vocabulary will prove useful in further mollusk identification.

a. heterodont = teeth varied in appearance
b. taxadont = numerous small teeth on the hinge. E.g., Ark shells
c. cryptodont = "hidden teeth", teeth very small or nonexistent

Which term best describes the mussel?
Exercise 3 Internal Anatomy Figure 4

1. Keeping the scalpel blade as close to the shell as possible, separate the valves carefully by cutting the anterior and posterior adductor muscles.

2. Identify the mantle as the thin tissue covering the visceral mass and the foot.

3. Bring 2 halves of the mantle together. Note the larger, ventral incurrent siphon and the smaller, dorsal excurrent siphon. These animals breathe and are nourished by filtering water in and out the siphons, trapping food particles.

4. Identify gills by folding away the mantle. If the gills appear puffy they may contain larvae—young mussels.

5. Note the large, tough, muscular foot used for locomotion.

6. Identify the labial palps as the limp flaps of tissue that channel food toward the mouth.

7. The main fleshy body is called the visceral mass. This contains the following internal organs:

   - mouth
   - stomach
   - digestive gland
   - gonads
   - anus
   - intestine
   - heart and pericardium
   - kidney
Simplified Key to Dog Island Plants

1. Beach Vegetation

2. Grasses

   3. Upright, over 2'

      4. blade width under 1"-------------Sea Oats

      4. blade width over 1"-------------Beach Grass

   3. Trailing, under 2'-----------------Sand Spur

2. Broadleaved Plants

   5. Leaves not fleshy------------------Seaside Primrose

   5. Leaves fleshy and......

      6. rounded------------------------Seaside Pennywort

      6. lobed--------------------------Beach Morning Glory

      6. narrow-------------------------Sea Purslane

      6. toothed------------------------Sea Rocket
1. Dune-Swale Vegetation

7. Pine trees
   8. Needles over 5" long----------------- Slash Pine
   8. Needles under 5" long----------------- Sand Pine

7. Other shrubs or trees

9. Leaves needle-like
   10. Green leaves--------------------- Florida Rosemary
   10. Gray leaves---------------------- Convadina

9. Leaves broad

11. Leaves 1" or less
   12. twigs gray---------------------- Youpon Holly
   12. twigs green--------------------- Inkberry

11. Leaves more than 1"

13. oblong------------------------ live oak
13. elliptic------------------------ myrtle oak

live oak

myrtle oak
CHECKLIST OF COMMON PLANTS OF DOG ISLAND

LICHENS

Raindeer Moss Cladonia sp.

FLOWERING PLANTS

Pinacea

Sand Pine Pinus clausa (P. glabra?)
Slash Pine P. elliotii

Typhaceae

Cattail Typha latifolia

Alismataceae

Arrowhead Sagittaria graminea

Poaceae

Sea Oats Uniola paniculata
Cordgrass Spartina patens
Sandspur Cenchrus echinatus

Cyperaceae

Sawgrass Cladium jamaicense

Arecaceae

Saw Palmetto Sevenoa repens

Juncaceae

Black Rush Juncus roemerianus

Liliaceae

Yucca Yucca aloifolia
Yucca Yucca filamentosa

Amaryllidaceae

Rain Lilly Zephyranthes simpsonii

Iridaceae

Blue-eyed Grass Sisyrinchium
Caryophyllaceae
Square Flower Paronychia erecta

Orchidaceae
Rose Pogonia Pogonia ophioglossoides

Saururaceae
Lizards tail Saurnrus cernuus

Fagaceae
Live Oak Quercus germinata

Polygonaceae
Sheep Sorrel Rumex hastatulus
Jointweed Polygonella gracillis

Aizoaceae
Sea Purslane Sesuvium portulastrum

Brassicaceae
Sea rocket Cakile constricta

Droseraceae
Sundew Drosera brevifolia

Rosaceae
Dewberry Rubus trivialis

Fabaceae (Bean)
Bladder pod Sesbania vesicaria

Fabaceae (Pea)
Beach Pea Galactia

Aguifoliaceae
Yaupon Holley Ilex vomitoria

Malvaceae
Salt Marsh Mallow Kosteleskya virginica

Hypericaceae
Saint John's Wort Hypericum reductum
DOG ISLAND FLOWERING PLANTS

Cistaceae
Rockrose  Helianthemum arenicoli

Cactaceae
Opuntia humifusa  O. pusilla

Melastomataceae
Meadow Beauty  Rhexia mariana

Onagraceae
Evening primrose  Oenothera humifusa

Apiaceae
Seaside Pennywort  Hydrocotyle bonariensis

Empetraceae
Florida Rosemary  Ceratiola ericoides

Loganiaceae
Rustweed  Polypremum procumbens

Gentianaceae
Sea Pink  Sabatia

Asclepiadaceae
Sandhill Milkweed  Asclepias humistrata

Convolvulaceae
Beach Morning Glory  Ipomoea stolonifera

Arrowleaf Morning Glory  Ipomoea sagittata

Polemoniaceae
Standing Cypress  Impomopsis rubra

Verbenaceae
Lantana  Lantana camara

Bladderwort  Utricularia subulata
**DOG ISLAND FLOWERING PLANTS** Continued

**Asteraceae**

- Beach Elder: *Iva imbricata*
- Groundsel Tree: *Pediarias halimifolia*
- Coreopsis: *Coreopsis sp.*
- Bauldwina: *Bauldwina agustifolia*
- Woody Goldenrod: *Chrysoma pauciflosculosa*
- Spanish Needles: *Bidens sp.*
MOST COMMON PLANTS OF DOG ISLAND

Arrowhead
Sagittaria lancifolia

Arrowleaf Morning Glory
Ipomoea sagittata

Beach Morning Glory
Ipomoea stolonifera

Bedstraw
Galium hispidulum

Black Rush
Juncus roemerianus

Bladderwort
Utricularia biflora

Blazing Star
Liatris chapmanii

Blueberry
Vaccinium darrowii

Blue-eyed Grass
Sisyrinchium atlanticum

Boneset
Eupatorium anomalum

Button Bush
Cephalanthus occidentalis

Chickweed
Stellaria media

Cattail
Typha latifolia

Conradina
Conradina canesens

Cordgrass
Spartina patens

Cranesbill Geranium
Geranium carolinianum

Dewberry
Rubus trivialis

Dog Fennel
Eupatorium capillifolium

Elderberry
Sambucus canadensis

Evening Primrose
Genothera humifusa

Florida Rosemary
Ceratiola ericoides

Frog Fruit
Phyla nodiflora

Glasswort
Salicornia virginica

Greenbrier
Smilax auriculata

Groundsel Tree
Baccharis glomeruliflora

Hat Pins
Ericaulon compressum

Henbit
Lamium aplexicaule

Hop Clover
Trifolium dubium

Jointweed
Polygonella polygama

Lily-turf
Liriope muscari

Lizard's Tail
Saururus cernuus

Marsh Elder
Iva frutescens

Meadow Beauty
Rhexia cubensis

Muscadine
Vitis rotundifolia

Narrowleaf Ground Cherry
Physalis angustifolia

Peppergrass
Lepidium virginicum

Pigweed
Amaranthus viridis

Poison Ivy
Toxicodendron radicans

Pokeweed
Phytolacca americana

Pony-foot
Dichondra carolinesis

Prickly Pear Cactus
Opuntia humifusa

Rain Lily
Zephyranthes simpsonii

Rockrose
Helianthus arenicola

Rustweed
Ploprenum procumbens

Saint John's Wort
Hypericum reductum

Salt Marsh Mallow
Kosteletzkya virginica

Sand Live Oak
Quercus geminata

Sandhill Milkweed
Asclepias pedicillata

Sand Pine
Pinus clausa

Sandspur
Cenchrus echinatus

Sand Vetch
Vicia acutifolia

Sandvine Milkweed
Cynanchum angustifolium
Saw Grass
   Cladium jamicense
Saw Palmetto
   Serenoa repens
Sea Oats
   Uniola paniculata
Sea Ox-eye or Sea Daisy
   Borrichia frutescens
Seaside Pennywort
   Hydrocotyle bonariensis
Sea Pink
   Silphia grandiflora
Sea Purslane
   Sussuvium portulacastrum
Sea Rocket
   Cakile constricta
Sheep Sorrel
   Rumex hastatulus
Slash Pine
   Pinus elliotti
Smartweed
   Polygonum punctatum
Sourgrass
   Oxalis dillenii
Spiderwort
   Tradescantia ohiensis
Spiny Sow Thistle
   Sonchus asper
Spurge Nettle or Tread Softly
   Unidoscolus stimulosus
Spanish Bayonet
   Yucca alhiniolia
Spanish Needles
   Bidens bipinatta
Square Flower
   Paronychia erecta
Sundew
   Drosera capillaris
Sweetbroom
   Scoparia dulcis
Toadflax
   Linaria canadensis
Venus Looking-glass
   Triodanis perfoliata
Vervain
   Verbena bonariensis
Water Primrose
   Ludwigia repens
White-top Sedge
   Dichromena colorata
Winged Sumac
   Rhus copallina
Woody Goldenrod
   Chrysoma pauciflosculos
Yaupon Holly
   Ilex vomitoria
Yucca
   Yucca filamintosa
<table>
<thead>
<tr>
<th>Species</th>
<th>Type</th>
<th>Distinctive Features</th>
<th>Flowering Season</th>
</tr>
</thead>
</table>
| Beach Morning Glory  | Perennial Vine | Glabrous, trailing and rooted at nodes  
Leaves alternate, leathery, notched at tip  
Corolla white         | Summer          |
| Sea Rocket           | Annual herb    | Upright growth  
Leaves alternate, very thick  
Pedals notched at tip, pedicels thick       | Spring, Summer   |
| Beach Elder          | Small Shrub    | Glabrous, decumbent, and branched at base  
Leaves alternate, oblanceolate                | Fall             |
| Seaside Pennywart    | perennial "creepers" | Glabrous, rooting from nodes  
Leaves basal, rounded and scalloped  
Flowers whorled on branches, small                      | Spring, Summer, Fall |
| Beach Pea            | perennial vine | Leaves 3-foliate (usually), entire  
Flowers one or two at a node | Summer          |
| Sea Purslane         | perennial herb | Fleshy, creeping + rooted at nodes  
Leaves opposite  
Flowers solitary, pink within and green externally | Spring, Summer, Fall |

1 Found in several other habitats
### BEACH-DUNE, Continued

<table>
<thead>
<tr>
<th>Species</th>
<th>Type</th>
<th>Distinctive Features</th>
<th>Flower Season</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sea Oats (1)</td>
<td>perennial grass</td>
<td>Rhizomatous, <strong>Leaves</strong> basal or stemmed, and glabrous, <strong>Grain</strong> dark red</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(1) Also found in Dune-Swale Habitat.</td>
<td></td>
</tr>
</tbody>
</table>

#### DUNE-SWALE HABITAT

- **Florida Rosemary**
  - **Type**: medium shrub
  - **Distinctive Features**: Much-branched, bark on older wood shreddy + gray, young twigs tomentose, **Leaves** alternate or whorled, linear, revolute and **sessile**, **Flowers** small, plants dioecious
  - **Flower Season**: Summ Fall

- **Square Flower**
  - **Type**: herb
  - **Distinctive Features**: **Leaves** opposite, entire, **Seed** red or dark red
  - **Flower Season**: Sprin Summ

- **Groundsel tree (1)**
  - **Type**: shrub
  - **Distinctive Features**: Glabrous stems, **Leaves** grayish, alternate, fleshy, serrate toward apex, **Flowers** yellowish, discoid, plants dioecious
  - **Flower Season**: Summ Fall

- **Jointweed (1)**
  - **Type**: perennial, woody at base
  - **Distinctive Features**: **Branches** internodally, **Leaves** linear, glabrous
  - **Flower Season**: Fall

(1) Also found in forest habitat.
<table>
<thead>
<tr>
<th>Species</th>
<th>Type</th>
<th>Distinctive Features</th>
<th>Flowering Season</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bauldwinia (1)</td>
<td>perennial herb</td>
<td>Erect, Stems ribbed, pubescent and usually not branching</td>
<td>Fall</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Leaves alternate, entire with tapering base</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Petals toothed at apex</td>
<td></td>
</tr>
<tr>
<td>Woody Goldenrod</td>
<td>shrub .5-1.5m</td>
<td>Glabrous, viscid on young growth; trunk short, stocky and freely branched</td>
<td>Fall</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Leaves stemmed</td>
<td></td>
</tr>
<tr>
<td>Rockrose (1)</td>
<td>perennial</td>
<td>Leaves stellate - pubescent</td>
<td>Spring</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Flowers of two types, showy yellow with long pedicels, and those with shorter</td>
<td>Summer</td>
</tr>
<tr>
<td></td>
<td></td>
<td>pedicels and no petals</td>
<td></td>
</tr>
<tr>
<td>Saint John's Wort</td>
<td>shrub 1-5 dm</td>
<td>Glabrous, stems angled, matted and decumbent</td>
<td>Spring</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Leaves opposite, entire with dots</td>
<td>Summer</td>
</tr>
<tr>
<td>Evening Primrose</td>
<td>perennial</td>
<td>Prostrate, hoary</td>
<td>Spring</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Leaves tipped with a spur</td>
<td>Summer</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Petals yellowish</td>
<td>Fall</td>
</tr>
<tr>
<td>Prickly Pears</td>
<td>cactus</td>
<td>Woody succulents, spines apically, barbed</td>
<td>Spring</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Summer</td>
</tr>
</tbody>
</table>

(1) Also found in forest habitat
<table>
<thead>
<tr>
<th>Species</th>
<th>Type</th>
<th>Distinctive Features</th>
<th>Flower/Season</th>
</tr>
</thead>
</table>
| Bladderwort      | Herbacious | **Stems** underground in moist sand  
**Leaves** dissected with small bladders or linear without bladders | Summer        |
| Rustweed (1)     | perennial herb | **Glabrous**, branches from central crown  
**Leaves** opposite, linear, rusty colored  
**Flowers** white | Spring, Summer, Fall |
| Sheep Sorrel     | Winter annual | **Stems** erect  
**Leaves** hastate | Spring        |
| Pogonia          | perennial herb | **Plant** glabrous  
**Leaf** solitary, half way up stem  
**Flowers** (1-3) terminate the stem, fragrant | Spring        |
| Sandhill Milkweed | perennial herb | **Stem** stout, glabrous  
**Leaves** opposite, sessile with pink to lavender veins | Summer        |
| Sundew           | Herb       | **No Stem**, rosette form  
**Leaves** with tentacle-like bristles and a sticky secretion | Spring        |

(1) Also occurs in forest habitat.
## DUNE-SWALE HABITAT, Continued

<table>
<thead>
<tr>
<th>Species</th>
<th>Type</th>
<th>Distinctive Features</th>
<th>Flowering Season</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arrowleaf</td>
<td>perennial vine</td>
<td>Stem glabrous&lt;br&gt;Leaves narrowly sagittate</td>
<td>Summer</td>
</tr>
<tr>
<td>Morning Glory</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meadow Beauty</td>
<td>perennial herb</td>
<td>Stem with course bristles, often colonial from horizontal roots&lt;br&gt;Leaves opposite&lt;br&gt;Flowers purplish to white, 1 - 2&quot; wide</td>
<td>Spring&lt;br&gt;Summer</td>
</tr>
<tr>
<td>Sea Pink</td>
<td>herb</td>
<td>Stem glabrous&lt;br&gt;Leaves opposite, entire and sessile&lt;br&gt;Flowers white or pink with a yellow eye</td>
<td>Summer&lt;br&gt;Fall</td>
</tr>
<tr>
<td>Blue-eyed Grass</td>
<td>herb</td>
<td>No Stem, leaves arising from roots&lt;br&gt;Leaves linear, erect + spreading</td>
<td>Spring</td>
</tr>
</tbody>
</table>

(1) Also occurs in forest habitat.

### FOREST HABITAT

<table>
<thead>
<tr>
<th>Raindeer</th>
<th>lichen</th>
<th>No true leaves, roots or flowers&lt;br&gt;Low growing, light green color, interbranched&lt;br&gt;Spore bearing tips pigmented brightly</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Moss</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(2) Also found in Dune-Swale Habitat.
<table>
<thead>
<tr>
<th>Species</th>
<th>Type</th>
<th>Distinctive Features</th>
<th>Flowering Season</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sand Pine</td>
<td>coniferous tree</td>
<td>Medium tree, dark bark and dropping branches&lt;br&gt;Leaves in 2's, 2-6 inches, deep green, twisted&lt;br&gt;Cones 1-3 inches long, minute prickles</td>
<td>Spring</td>
</tr>
<tr>
<td>Slash Pine</td>
<td>coniferous tree</td>
<td>Large tree, bark purplish brown, peeling in thin, paper-like plate&lt;br&gt;Leaves 7-10 inches longs, in 3's and 2's&lt;br&gt;Cones 3-7 inches long, slender prickles</td>
<td>Spring</td>
</tr>
<tr>
<td>Sand Live Oak</td>
<td>tree</td>
<td>Branches wide spreading&lt;br&gt;Leaves glabrous above, tawny sellate pubescence below</td>
<td>Spring</td>
</tr>
<tr>
<td>Saw Palmetto</td>
<td>armed shrub</td>
<td>Stems horizontal, branched&lt;br&gt;Leaves palmately divided, up to 1 m across</td>
<td>Spring Summer</td>
</tr>
<tr>
<td>Yucca</td>
<td>shubby perennial</td>
<td>Trunk very short or absent&lt;br&gt;Leaves 2-6 dm, edges fraying into fibers</td>
<td>Summer</td>
</tr>
<tr>
<td>Dewberry</td>
<td>Woody vine</td>
<td>Stems trailing, slender with gland-tipped bristles&lt;br&gt;Leaves usually 5-foliate, purplish&lt;br&gt;Flowers solitary or in 3 flowered cymes</td>
<td>Spring Summer</td>
</tr>
</tbody>
</table>

(1) Also found in the Dune-Swale Habitat and disturbed areas.
### FOREST HABITAT, Continued

<table>
<thead>
<tr>
<th>Species</th>
<th>Type</th>
<th>Distinctive Features</th>
<th>Flower/ Season</th>
</tr>
</thead>
<tbody>
<tr>
<td>Youpon (1) Holly</td>
<td>Evergreen shrub</td>
<td>Twigs puberulent, Leaves elliptic, lustrous above, Fruit a red drupe, bb size</td>
<td>Spring</td>
</tr>
</tbody>
</table>

(1) Also found in the Dune-Swale Habitat.

### WETLAND HABITAT

<table>
<thead>
<tr>
<th>Species</th>
<th>Type</th>
<th>Distinctive Features</th>
<th>Flower/ Season</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black (1) Rush</td>
<td>Grass- herb</td>
<td>Stems glabrous, tufted, 0.5-1.5m tall, Leaves round, stiff and pungent</td>
<td>Spring, Summer</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Fall</td>
</tr>
<tr>
<td>Cord (1)</td>
<td>perennial grass</td>
<td>Stems glabrous, tufted, Leaves (blades) to 6 dm long, sandpapery above, glabrous beneath</td>
<td>Summer</td>
</tr>
<tr>
<td>Arrow- (2) head</td>
<td>Aquatic herb</td>
<td>Leaves basal, Emerged leaves linear to oval, submersed leaves phylloidial</td>
<td>Summer, Fall</td>
</tr>
<tr>
<td>Lizards (2) tail</td>
<td>Aquatic Herb</td>
<td>Stem pubescent, Leaves alternate, lanceolate-cordate, Flowers opposite leaves, arranged in a narrow plume</td>
<td>Spring</td>
</tr>
</tbody>
</table>

(1) Salt Marsh only.

(2) Fresh Marsh only.
### WETLAND HABITAT

#### Species

<table>
<thead>
<tr>
<th>Species</th>
<th>Type</th>
<th>Distinctive Features</th>
<th>Flowering Season</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sawgrass (1)</td>
<td>sedge</td>
<td>Flowering stems glabrous, plants tufted to 3m tall</td>
<td>Summer</td>
</tr>
<tr>
<td></td>
<td>(grass-like perennial)</td>
<td>Leaf blades to 1m tall, 8-12 mm wide with rough saw-like margins</td>
<td></td>
</tr>
<tr>
<td>Cattail (1)</td>
<td>grass-like perennial</td>
<td>Leaves erect, sheathing stem base and higher than flowering stem</td>
<td>Spring, Summer</td>
</tr>
<tr>
<td>Salt Marsh (1) Mallow</td>
<td>perennial herb</td>
<td>Stems stellately pubescent, several arising from root crown</td>
<td>Summer</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Leaves alternate, simple, triangular lanceolate</td>
<td></td>
</tr>
</tbody>
</table>

#### DISTURBED HABITAT

<table>
<thead>
<tr>
<th>(1)</th>
<th>(1)</th>
<th>Sandspur</th>
<th>Annual grass</th>
<th>Stems tufted, culms 2-10 dm tall</th>
<th>Blades rough above, smooth below</th>
<th>Fruit with sharp spines</th>
<th>Spring, Summer, Fall</th>
</tr>
</thead>
</table>

| Spanish Bayonet | Shrub | Trunk stocky, usually more than 3 dm high | Leaves spiny along margins | Summer |

(1) Both fresh and Salt Marsh. 

(1) Also found in other habitats.
### Disturbed Habitat, Continued

<table>
<thead>
<tr>
<th>Species</th>
<th>Type</th>
<th>Distinctive Features</th>
<th>Flowering Season</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spanish Needles</td>
<td>herb</td>
<td>Stems usually glabrous, solid</td>
<td>Fall</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Leaves opposite, usually serrate</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fruit, &quot;beggars tick&quot;</td>
<td></td>
</tr>
<tr>
<td>Coreopsis</td>
<td>herb</td>
<td>Flowers both ray and disk</td>
<td>Spring</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Involucre with 2 series of bracts, the inner wider than the outer or the outer foliaceous</td>
<td></td>
</tr>
<tr>
<td>Bladderpod</td>
<td>Annual herb</td>
<td>Stem glabrous, 1-2 m tall</td>
<td>Summer</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Leaves even pinnate, entire with 20 or more leaflets</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fruit a conspicuous, inflated pod</td>
<td></td>
</tr>
<tr>
<td>Standing (1)</td>
<td>biennial</td>
<td>Stem erect, pubescent to 1 m tall</td>
<td>Summer</td>
</tr>
<tr>
<td>Cypress</td>
<td>herb</td>
<td>Leaves pinnately divided into numerous, thin segments tipped with a spur</td>
<td></td>
</tr>
<tr>
<td>Rain Lilly</td>
<td>bulbous herb</td>
<td>Scape glabrous</td>
<td>Spring</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Leaves linear, sheathing at base</td>
<td>Summer</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Flowers pink, solitary, terminal, subtended by a tubular, membranous bract which splits on 1 side for about 1/4 its length</td>
<td>Fall</td>
</tr>
<tr>
<td>Latana</td>
<td>herb, woody at base</td>
<td>Stems angular, pubescent</td>
<td>Spring</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Leaves aromatic, opposite, crenate</td>
<td>Summer</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Flowers clustered and trumpet shaped</td>
<td>Fall</td>
</tr>
</tbody>
</table>

(1) Also found in other habitats
Marine Life (Shells, etc.)


Abbott, R. Tucker. AMERICAN SEASHELLS. American Malacologists, Inc. 1972 (2nd ed.).


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Plants


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Birds


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USDA. *Common Weeds of the United States.* Dover, N.Y.

Vilas, Curtis N. *Florida Marine Shells.* C. E. Tuttle. P. O. Box 410, Rutland, VT. 1970.


Winn and Olla. *Behavior of Marine Animals.* Vols. 1, 2, 3, and 4.

Perry and Schwengel. *Marine Shells of the Western Coast of Florida.*
Year after year beheld the silent toil
That spread his lustrous coil;
Still, as the spiral grew,
He left the past year's dwelling for
the new,
Stole with soft step its shining
archway through,
Built up its idle door,
Stretched in his last-found home,
and knew the old no more.

Thanks for the heavenly message
brought by thee,
Child of the wandering sea,
Cast from her lap, forlorn!
From thy dead lips a clearer note is
born
Than ever Triton blew from
wreathed horn!
While on mine ear it rings,
Through the deep caves of thought
I hear a voice that sings;

Build thee more stately mansions, O
my soul,
As the swift seasons roll!
Leave thy low-vaulted past!
Let each new temple, nobler than
the last,
Shut thee from heaven with a dome
more vast,
Till thou at length art free,
Leaving thine outgrown shell by
life's unresting sea!

Oliver Wendell Holmes
from
The Chambered Nautilus
Welcome

WELCOME to the third annual Calhoun Spring Wilderness Pilgrimage! As an indication of the physical beauty and spiritual renewal offered by a seashore pilgrimage, we would like to share these lines written in 1858:

Year after year beheld the silent toil
    That spread his lustrous coil;
Still, as the spiral grew,
He left the past year’s dwelling for the new,
Stole with soft step its shining archway through,
Built up its idle door,
Stretched in his last-found home, and knew the old no more.

Thanks for the heavenly message brought by thee,
Child of the wandering sea,
Cast from her lap, forlorn!
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Let each new temple, nobler than the last,
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Till thou at length art free,
Leaving thine outgrown shell by life’s unresting sea!

Oliver Wendell Holmes
from
The Chambered Nautilus

Barrier Island Ecology

March 7-12, 1989
on
Dog Island, Florida

A Professional Development activity for faculty and staff of Calhoun Community College
Information

What: An environmental awareness field study of the plants and animals of a barrier island.

Where: Dog Island, Florida

When: During the Professional Development Workshop, March, 1989

Instructors: Dr. Don Collier, Dr. Bettye Gregg, Ms. Donna Lee, and Mr. George Williams

Fee: $185.00 per person

Fees Include:

- accommodations at the Pelican Inn -- one double bed per individual (room shared with another participant).
- transportation -- vehicles will leave Calhoun Community College Tuesday evening, March 7 and return on Sunday morning, March 12.
- ferry to and from the Island
- shrimp feast

Fees will NOT include the following:

- meals while traveling and 8 meals on the island. Estimated cost, $50.00.
- phone calls, or traveling incidentals

Payment of fees:

- $85.00 deposit for accommodations, due by January 19.
- $100.00 balance due by February 28

Reservations will be made on a first-come, first-served basis, pending payment of deposit. Deposits will be accepted beginning 8:00 a.m., Thursday, January 12 through 12:00 noon, Thursday, January 19. Enrollment will be strictly limited to 14 participants. For information and trip registration forms, contact Patricia Lambert, Natural Sciences secretary, extension 444.

Planned Activities:

- ferry ride to a barrier island in the Gulf of Mexico
- nature hikes to observe coastal vegetation, and marine life on tidal flats....
- shrimp feast on the island....
- photomicroscopy of marine life identification of mollusks
collection of seashells....
- leisure time on the beach....