



Fort Wilderness

Marine Biology in the Keys



My name is Michael Lane and I am the Director of Science Education at Fort Wilderness Ministries. During the 1980's I began a program that allows high school students in the Midwest to experience a special dream of studying Marine Biology on site in the semi-tropical water of the Florida Keys. As a former Biology teacher, past instructor and curriculum developer at the John G. Shedd Aquarium in Chicago and a resident of the Bahamas, I can give students a solid foundation in marine science.

Picture this: The temperature is a balmy 85 degrees and a light breeze comes off the ocean. You don your dive mask and your fins. Then comes the signal from your group leader to jump in and begin observing and collecting marine life. Through your dive mask you see a kaleidoscope of living colors in the form of fish and marine invertebrates. Off in the distance a barracuda swims by, curious of the expedition.

Sounds like a Discovery Channel video? Well, this is an average day for those enrolled in the Fort Wilderness Marine Biology Program.

Each Easter season for the past 23 years I load up a chartered bus with around 30 students and adults to travel to the only coral reefs you can actually drive to in the U.S. Once there, we move into a hotel and convert it into a biology research station for 9-days. I am a national and state award recipient in education and I will take you on a learning experience of a lifetime. Sharing my expertise with that of other instructors, you will encounter hands on laboratories that have only been a dream in your past. During the 9-days on site, you will spend one day swimming with stingrays and visiting their world famous Theater of the Sea, just a short distance from where we stay.

Besides those experiences, you will be placed in a group that carries a habitat name such as Coral Reefs, Mangroves, Grass flats, etc. Together with other members in your group you will participate in responsible collecting, snorkeling, chemical analysis of water samples, excursions to habitats, lectures on the beach and many other activities. And this is just an average day!

One of the habitats we study is a coral reef six miles off shore called the Coffin Patch. We travel to the reef by boat and there, participants get to see up close hundreds of varieties of colorful fish, corals, and invertebrates.

I am in the process right now of forming this year's class and I would like you to be included too. Whether you want to see if marine biology is a career for you, if you are just wanting a great hands-on learning experience, or if you want to experience a closer look **at God's creation, this trip is for you.** I am looking for students that want a challenge, are willing to learn, and want to experience God's ocean world first-hand while deepening their relationship with God. For further information, you can contact me at Fort Wilderness at 800-338-3678 or 715-277-2587. You can also email me at michaellane@fortwilderness.com or check out our site at www.fortwilderness.com. So come along for the best learning experience of your life. Room fills up fast, so don't wait.



Fort Wilderness Marine Adventure

The Marine Biology Adventure offered through Fort Wilderness Ministries is a “hands-on” learning experience of the ocean environment. Students are transported to the Florida Keys for a 9-day, in-depth study of marine organisms, habitats, and environments, including a chance to swim with stingrays, dive on a shipwreck site, and much more. The participants are transported by coach bus to and from the Keys and once in Florida, lessons begin on the bus.

During their week in the Keys, participants will be working from textbooks specifically written for this course. All other instructional materials necessary will be provided. Participants are encouraged to complete and fill their lab books with as much information as possible from their learning. At the end of the weeklong experience, the participants will be evaluated with an exam, which will count 50% of their grade. The remaining 50% is devoted to participation in seminar attendance, oral reports, excursion attendance, and cooking details. At the completion of the course, a letter grade and a percentage grade will be issued & credit or transcript information can be applied to the schools if the participants desire this.

EDUCATIONAL OBJECTIVES & STUDENT REQUIREMENTS

I. EDUCATIONAL OBJECTIVES

- A. To gain an appreciation for the ocean and its wealth of resources.
- B. To study in class and on location, the flora and fauna and their habitats in oceans.
- C. To observe and understand ecological relationships that exist among marine organisms within a variety of habitats.
- D. To understand and practice necessary precautions in marine study.
- E. To have the opportunity to enhance their relationship with God.

II. SPECIFIC REQUIREMENTS FOR EVALUATION

- A. Part of our work will concern the study of marine organisms. This may include organisms, which are collected to keep, organisms, which are collected for study in one of the holding tanks and then returned alive to the ocean area where they were found, or specimens which are discovered and studied in their natural habitats. In any case, the following guidelines apply:
 - 1. Responsible collecting - for those specimens intended for keeping or study. Unless Mr. Lane gives special permission, all live specimens must be return before nightfall. This helps insures their survival.
 - 2. Identification of a minimum of 20 marine animals and habitats, and a minimum of 10 marine plants. Numbered listings of these specimens must be entered on the separate pages provided in the lab data book.
 - 3. Responsibilities for classifications:
 - a. Complete classification of all algae and animal specimen. All records must be kept in the appropriate specimen record portions of the lab data book. There are separate sections for plants and the different phyla for the animals. As always, use specimen identification numbers. Complete classification includes all seven taxonomic levels: Kingdom, phylum, class, order, family, genus, and species are desired, but may be difficult to obtain. To accomplish this, it will be necessary to make use of

the taxonomic keys and other reference materials provided. (Some exceptions of families & orders may be allowed.) The classifications must be recorded in numerical sequence to match that the specimen page. A drawing is required for each algal specimen and is suggested for the animal pages also.

- b. A prescribed number of specimens in each phylum should be classified. Following is a list of the phyla and the *suggested* number of specimens to be classified for each phylum. Extra classifications are encouraged.

NUMBER	PHYLUM
2	Porifera
3	Cnidaria
3	Mollusca
3	Echinodermata
2	Annelida
2	Arthropoda
<u>5</u>	<u>Chordata</u>
20	Total

4. Use of proper preservation and handling of all of those specimens, which are intended for personal collection. But approval to make personal collections must be approved by Mr. Lane before handling of specimens.
5. Use of proper labels on all specimen jar and/or specimens. Labeling must be completed before departure from Florida. All labels must be patterned after the one below. Place the label on the specimen jar, and protect it with wide cellophane tape.

Specimen Number _____	Habitat _____
Location _____	
Phylum Name _____	
Scientific Name _____	
Common Name _____	
Collector _____	Date _____

6. Research and complete ecological profiles for a minimum of 5 identified specimens, representing at least 5 different phyla.
7. Attendance to *ALL* on location seminars, including stingray studies at an educational facility is required. At these seminars, you are expected to record notes and participate in any discussions. At the end of each seminar, worksheets found in the lab book are to be completed. Resources for the worksheets should come from seminar notes, appropriate textbook material, and other library sources provided. If difficulty in obtaining the required information occurs, see the habitat leader or Michael.
8. Working in a group, a thorough study is to be made of one particular habitat, (rocky coast, mangroves, etc.). The habitats will be assigned to specific groups, with no two groups assigned the same habitat. This study is to include a description of the physical parameters of the habitat, population studies, distribution of species, identification of the indicator (primary) species of flora and fauna, and determination of ecological relationships. Each group will present its work orally to the entire group in a regular seminar session toward the end of the week. The seminar will reinforce the knowledge of the major habitats in this area. In addition to the oral presentation each group is to post written information of their habitat study on newsprint and tape this to the walls of the eating room for others to read.
9. A required two-hour written exam will be conducted on site.
10. It is expect that each member of the program write an evaluation of this marine biology experience. This is intended to improve the experience and benefit future groups. Please be honest and open with remarks.
11. Evaluation of student work in this course will be made by the instructor's examination of several aspects of your work. The following will constitute the evaluation:
 - a. A subjective appraisal (efficiency rating) will be made of the **student's work, work habits, cooperation, attendance, etc.**
 - b. The two hour written exam will be evaluated.
 - c. The participation in the oral habitat presentation will be evaluated.
 - c. **The academic quality of the student's seminar participation will be evaluated.**

Students will not be graded by any one instructor. Rather, a joint evaluation by several instructors will hopefully **more accurately determine the quality of the participant's** work in meeting the criteria listed above.

12. Each participant is strongly encouraged to help one another in fulfilling the requirements listed above. Take advantage of others' strengths by exchanging ideas, information, specimens, and help. Some people are going to be more interested in shells, others in crabs, etc. It is important that we all help one another. But note: there is a distinct difference between providing information for copy and sharing information. Take every opportunity to seek help from any of the scientists in the group. Speaking for all of us leaders, we are here to help each person make this experience the greatest educational experience of his or her life. Work us hard!
13. We also want to emphasize responsible collecting. Do not collect more specimens than is need or have time to care for properly. If a participant is collecting specimens to preserve for a personal collection, get permission from Mr. Lane first. Then, if he approves the choices, preserve them correctly and label them properly as soon as possible. Remember that care needs to be exercised to preserve the natural ecosystems. Over-collecting disrupts and endangers this delicate balance. Florida state law prohibits the collection or touching of any coral, alive or dead! Also, conch and lobsters are only obtainable with a license. I suggest that you wait a few days before you start adding to a personal collection. This will allow time to discover the difference between a specimen and a good specimen. But remember, **"be responsible!" We are here to study the ecosystems, not destroy them!**
14. (OPTIONAL) Participants are invited to dissect certain specimens if given approval from Mr. Lane. Some of the best educational experiences can come from a very close study of the anatomy of many marine creatures. But I do challenge you to make this a last resort. Much more knowledge can be gained from live observations that from observing a dead animal. If dissection is chosen, it must always be performed under the guidance of one of our biologists.
15. (OPTIONAL) Participants are invited to conduct a scientific experiment of the ocean's environment and/or organisms while on location. Guidelines for the protocol, follow through, and write-up of the experiment are found in the lab book. A written report may be submitted at the end of the study.

Wisconsin Academic Standards for Science covered in this Marine Biology Course:

E.12.2	Earth Cycles
F.12.6,12	Vertebrates
F.12.6,12	Invertebrates
F.12.11	Energy in Living Systems
EEB. 12.1	Energy in Living Systems
F.12.9	Food Chains & Webs
F.12.9	Photosynthesis
EEB.12.2,7	Ecosystems
F.12.7,12	Ecosystems: Organism Interaction & Behavior
EEB.12.4-6,8	Threatened, Endangered, & Extinct Species
H.12.2	Science & Society: Community Expert Interview
A.12.3	Measurement for Scientific Data Collection
A.12.6-7	Scientific Method
C.12.1-7	Scientific Method
H.12.4-7	Scientific Method
EEA.12.1-5	Scientific Method
C.12.4	Data Collection: Hydrology