

Title:

N-5: Enhance the Southeast Florida Coral Reef Initiative Florida reefs and ecosystems curriculum, including educating educators on available resources, and mandate that it be taught once in elementary school, once in middle school and once in high school (every school year) to provide science-based foundation for making future decisions to protect coral reefs.

Background:

- This recommended management action relates to the Southeast Florida Coral Reef Initiative (SEFCRI) region i.e. Miami-Dade, Broward, Palm Beach and Martin counties.
- The program is applicable to public and private school sectors and should address watersheds in inland areas that affect these coastal and marine habitats (including coral reefs, hardbottoms and estuarine ecosystems), due to the connectivity of said habitats.
- All elementary, middle and high schools should implement this program.
- This recommended management action is being put forth due to the lack of uniformity in education standards related directly to Florida coral reefs. A connection between the required educational standards and the unique local ecology of southeast Florida is lacking. A strong foundation in sciences (particularly marine science) for United States students is also lacking.
- In general, there is a lack of education, awareness, appreciation/reverence with respect to the marine environment by the general population.

Objectives:

- The intended outcomes of this recommended management action are: (1) to increase the awareness and knowledge of coral reefs, specifically in the SEFCRI region, (2) enhance the health of Florida coral reefs through increased education, and (3) provide strong science-based foundations to students and parents for making future decisions to encourage stewardship of reef resources.
- The recommended action also intends to create a better-educated group of citizen activist-students who will be culturally informed and value and protect our natural environment. Students will, in turn, positively affect their friends and family.
- The recommended action addresses the problem of a public that is not aware of the importance of and threats to our local reef ecosystem
- The recommended action aims to develop a generation of educated stewards who desire to conserve our marine environment and facilitate the implementation of other recommended management actions.

Intended Benefits and/or Potential Adverse Effects:

- There are no anticipated negative environmental impacts, nor are there any threats of adverse social or economic effects associated with this action.
- The duration of the benefits of this recommended management action is continual and ongoing.
- Some potential benefits of implementation of this recommended management action include improved knowledge base of students, parents and teachers. A way to achieve these benefits is by creating a standardized, uniform curriculum for coral reef education across the state. Improved environmental stewardship and appreciation: The more educated the population is, the greater likelihood that it will be more aware of and comprehend environmental issues pertaining to coral reefs. With increased knowledge of such issues, there will be less need for recovery and repair to coral reefs which are often harmed by avoidable damage. This type of program will nurture an informed citizenry and encourage a cultural shift towards ecosystem-based management. This could stimulate student interest in STEM (Science, Technology, Engineering and Math education) programs.
- Potential issues that may arise with implementation of this recommended management action include:

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- (1) introducing another mandate and potential backlash among teachers and school districts in an increasingly data-driven environment (rigorous testing and dependence on standardized test scores), (2) difficulty getting new mandates through the approval process, (3) the time and cost to develop a new curriculum, (4) uncertain funding if programs are grant-based, (5) difficulty moving through bureaucracy to get this program mandated, (6) the logistics of implementation of a such a program, and (7) resistance to change. Students and parents, however, are likely to be supportive.
- Include education on potential careers in marine and conservation industry.

Agencies/ Organizations:

- The lead agencies/agents for implementation of this recommended management action are local school board representatives, teachers, science curriculum supervisors in each district and the Florida Marine Science Educators Association (FMSEA).
- The key stakeholders for this recommended management action are students, parents and teachers.
- The legislative considerations include the possible need for legislative approval.

Permitting/ Enforcement Requirements of RMA:

- There are no permitting or enforcement requirements for this recommended management action.

Cost:

- The estimated direct cost of implementing this recommended management action is \$50,000-\$100,000 for a one-time cost associated with curriculum creation followed by occasional updates.
- No potential funding sources have been identified at this time.

Time Frame & Extent:

- The anticipated timeframe for implementation of this recommended management action is 1 - 2 years.

Miscellaneous Info:

- This recommended management action is not linked to other recommended management actions.
- Some uncertainties or gaps with this recommended management action include: approval from local school boards would probably be necessary, or the state legislature could mandate the program; authoring the curriculum and how long it would take to implement; the specific grade levels this recommended management action would target.
- Supporting and relevant data includes an online forum that would provide access to many more people. This could be added to the curriculum to address issues. Other potential sources of information include: Fldoe.org, CPALMS student resources and tutorials.
- Upload curriculum to the above-mentioned websites.
- SEFCRI offers teacher trainings and curriculum activities for K-12.
- Armstrong, H. 2005. Environmental education in Tobago's primary schools: a case study of coral reef education. *Revista de Biologia Tropical*, Vol. 53.
- Suggestion was made to meet with marine magnet schools (MAST, Broward County) to get guidance on how to approach this.
- Explore options to make this mandatory: consultants exist that can assist with this.
- Curriculum and activities are currently available through SEFCRI and COSEE, perhaps others. However, these resources are not widely known and not intrinsic parts of the K-12 science education curriculum (no coral reef units exists for any grade level).
- Encourage field trips and environmental interaction.