Title:

N-8: Promote public education programs like "Be Floridian", "Rain Gardens", "Nature Scape", and "Florida Yards and Neighborhoods" to encourage eco-friendly yard and garden practices to help reduce the amount of nutrients and other pollutants reaching the reefs through residential runoff.

Background:

- This recommended management action relates to the Southeast Florida Coral Reef Initiative (SEFCRI) counties and upland communities (urban and suburban), in particular those densely populated areas with high percentages of impervious surface area.
- This recommended management action is being proposed due to nutrients entering the estuaries and reefs from residential properties that contribute to poor water quality, algal blooms, etc. Rain gardens are designed to slow rainwater runoff, allow percolation and increase nutrient reduction while enhancing localized urban landscapes. By reducing stormwater runoff, pollutants are able to be filtered out of water by plants and soil. The volume of untreated water reaching surface waters (e.g. estuaries) is reduced, along with pollutant levels.

Objective:

- The intended outcomes of this action are: (1) to increase awareness among homeowners on how their behaviors can help reduce nutrients entering the estuaries and ocean from runoff associated with lawn care and gardening practices, (2) to improve water quality as a result of the reduction of nutrients entering the system from residential sources, and (3) to leverage existing programs (e.g., Be Floridian, Rain Gardens, Nature Scape**,** and Florida Yards and Neighborhoods) to distribute educational materials that link residential nutrient inputs to the reefs.

Intended Benefits and/or Potential Adverse Effects:

- Benefits of implementation of this recommended management action include giving the public an "action item" - something they can do to help save the lagoon, reefs and ocean. The messaging helps make the connection between backyards and the larger watershed and raises homeowners' awareness of their impact on the marine ecosystem. This recommended management action will also reduce the volume of surface water runoff, replenish the surficial aquifer and help reduce pollutant loads in ground and surface waters. This action aims to improve the quality of the water reaching surface water and ground water. It may encourage the use of native plants, reduce grassy lawn areas and decrease nutrient and pesticide contamination of surface waters.
- There will be a reduction of nutrient pollution caused by fertilizer. Lowering nutrient loading from residential fertilizer will eventually reduce the amount of nitrogen entering the watershed from stormwater and ground water. This in turn will reduce algal blooms and other nutrient-related eutrophication issues in the estuaries, improve habitats for juvenile reef fishes and result in cleaner water reaching the reefs.
- This action could also provide small, highly-localized stormwater runoff catchment basins in areas where large municipal projects are not feasible.
- Once established, this program would help build a cadre of citizens actively engaged in protecting and restoring the estuaries and reefs and could add a new area of focus for gardening enthusiasts (Master Gardeners and Native Plant Society chapters).
- Some possible issues that may arise with implementation of this recommended management action include: the difficulty of measuring the success or impact of this type of education/outreach campaign, and the financial cost and level of effort needed to retrofit existing landscapes could

make it challenging for some.
- The duration of the benefits of this recommended management action will need to be recurring to reach a broad and sometimes changing target audience (e.g., new homeowners moving into the region).
- There is minimal threat to implementing this recommended management action. The extent of the impact depends upon number built, e.g., if implemented in densely populated areas, rain gardens could have a measurable impact on the quality and quantity of both runoff and groundwater.

Agencies/ Organizations:

- The lead agency for implementation of this recommended management action would be the Florida Department of Environmental Protection (FDEP) Coral Reef Conservation Program's Education and Outreach section, which could design brochures and provide them to relevant, existing programs, such as the University of Florida's *Institute of Food and Agricultural Sciences* (UF-IFAS) and county agricultural extension offices. The South Florida Water Management District (SFWMD) could provide educational brochures.
- Other potential agencies or organizations who could be involved include nature centers (e.g., Hobe Sound Nature Center in Martin County, Gumbo Limbo in Palm Beach County), the Florida Yards and Neighborhoods and Florida Master Gardener programs, 4-H and ag clubs. This action would probably be best implemented by relevant county governments, local Master Gardener programs and local chapters of the Florida Native Plant Society (FNPS). County government involvement would lend legitimacy to the program. Master Gardener and FNPS could provide practical, hands-on advice.
- The key stakeholders for this recommended management action are estuary and reef advocates.
- No legislative considerations were identified for this recommended management action.

Permitting/ Enforcement Requirements of RMA:

- Permitting requirements for this recommended management action may include the need to obtain waivers to work in buffer/setback zones
- There are no enforcement requirements for this recommended management action.
- Measurable Outcomes/Success Criteria/Milestones for this recommended management action could include: (1) the number of homeowners reached by the program, as reflected in the numbers of brochures distributed and hits on websites, etc., (2) increase in homeowner awareness of the potential impacts of nutrients on coral reefs could be measured via a web-based survey that randomly polls people throughout the SEFCRI region. (The survey could be repeated 2 years after the implementation of the program.), and (3) each property owner who implements the program could be asked to voluntarily provide information to the county UF-IFAS office, which could then compile data on a county-by-county basis. Ideally, there would be a cumulative database established that could quantify the volume of runoff and pollutants that are being prevented from directly entering our surface waters. (Comment from SEFCRI Team/TAC 2015 Review.)

Cost:

- The estimated direct cost of implementing this recommended management action is 0 - $100,000.
- Potential funding may be acquired through numerous grant programs available for the promotion of pollution reduction education. The following agencies and entities offer such programs: the United States Environmental Protection Agency (EPA), UF-IFAS, individual counties, SFWMD, Florida Native Plant Society, Flower Wild Flower Society and several license plate funds.

Time Frame & Extent:

- The anticipated timeframe for implementation of this recommended management action is 0 - 2 years.

Miscellaneous Info:

- This recommended management action is linked with N-1, N-5, N-21 and N-68.
- Some uncertainties or gaps with this recommended management action include: understanding the effectiveness of public awareness initiatives is a difficult undertaking, with no clearly measureable metrics showing the degree of success. There is a need for documentation demonstrating the linkage between what happens in our coastal estuaries and conditions on our nearshore reefs.
- Supporting and relevant data includes the following:
    - Residential fertilizers are a well-documented source of excessive nitrogen in receiving waters (Baker et al 2001, Driscoll et al 2003, Boyer et al 2002, Law et al 2004, Zhu et al 2004, Bowen and Valiela, 2008).
    - In the northeast United States, research estimates that fertilizer contributes up to a quarter of the total nitrogen loads to aquatic systems (Howarth et al 1996).
    - Florida studies show varying results but have indicated a strong enough correlation that the Tampa Bay National Estuary Program (TBNEP) instituted the "Be Floridian" program. Research by MACTEC (2009) estimated fertilizer contributed 20% of total nitrogen loads to Wekiwa Springs, while Leggette, Brashears and Graham, Inc. (2004) estimated that it contributed 79% of nutrient loads to Lake Tarpon in Pinellas County.
    - The west coast "Be Floridian" campaign created an engaging web site (www.BeFloridian.org) and Facebook page, as well as news and billboard advertisements, educational materials, and engagement activities that can easily be revised for use in the SEFCRI region. Educational materials include information on Florida friendly lawn care products, and fertilizer impacts to water quality.
    - The proposed project could target both retail businesses and homeowners. The Tampa Bay market study demonstrated that changing behavior was most successful if the message was received in both a broadcast format (billboards, radio PSA, Facebook, etc.) as well as at points of sale (summer restriction reminders, product lists, fertilizer rack cards, etc.). The project will deliver many tangible products to be used throughout the SEFCRI region, including printed materials, point of purchase sales rack cards, the multi-faceted and dynamic "Be Floridian" website, and three "Be Floridian" Event Toolkits that educators throughout the watershed could use at festivals and events. A media campaign could be conducted using the creative messaging and social media strategies that were so effective in the Tampa Bay area to activate and energize the public as protectors of our waterways.
    - A "Be Floridian" program, customized to the IRL counties, was recently launched (www.befloridiannow.org).
    - Seagrass enhancement: The TBNEP's focus on nutrient pollution led to the development of the Nitrogen Management Consortium, an innovative public-private partnership that brought together a variety of stakeholders to address the causes of worsening water quality and loss of seagrasses in Tampa Bay. Over the years, reductions in nutrient inputs has resulted in a resurgence in seagrasses, with a more than 6,000-acre increase over 1980s levels.
    - United States Geological Survey began researching this concept in the early 2000s (see: http://pubs.usgs.gov/sir/2005/5189/PDF/SIR2005_5189.pdf
    - The results of EPA research on this topic can be found at :http://www.epa.gov/greeningepa/stormwater/edison_rain_garden.htm)
    - UF-IFAS research and recommendations are available at:

http://www.gardeningsolutions.ifas.ufl.edu/design/types-of-gardens/rain-gardens.html
    - Local governments and UF-IFAS have conducted enough research that they market the concept to homeowners (see https://fyn.**ifas**.ufl.edu/.../LA_CEU_Module_3_**Rain_Gardens**_April_13_2010.ppt)

- Currently, educational initiatives regarding environmental stewardship have been increasing in recent years as we have learned more about the adverse impacts of runoff from residential properties on aquatic ecosystems.
    - The "Be Floridian" initiative began with the Tampa Bay National Estuary Program and, due to its success, is now being used as a model for counties in the Indian River Lagoon Watershed. Simultaneously, UF-IFAS has been working to increase homeowner knowledge about environmental stewardship through its Florida Yards and Neighborhoods Homeowner program. Although these programs are increasing the awareness of residents that proper stewardship of their properties can have an effect on the environment, these programs currently do not include information on how our Florida reefs can benefit from such stewardship.
    - Martin County Engineering Department and Martin County Extension Office are cooperating to encourage property owners to build rain-gardens (created low areas planted with wetland plants) designed to capture runoff from roofs, driveways, etc. They have developed two demonstration rain gardens on public lands, one at a public library and one associated with a stormwater retrofit location in old Palm City. The City of Stuart has installed pervious concrete on some roads to reduce levels of runoff.
    - Similarly, Palm Beach County has developed a demonstration rain garden as part of the garden complex at the UF-IFAS Agricultural Extension office Mounts Building.
    - In Broward County, through their Nature Scape program, property owners are encouraged to use rain barrels, rain gardens and bio-swales, all designed to reduce direct runoff into surface waters.
    - Miami-Dade's Parks and Recreation Department and Agricultural Extension office recommends the use of rain barrels and rain gardens and offers workshops in rain barrel creation.

Goals/ Objectives to be achieved:

Refer to the SEFCRI Coral Reef Management Goals and Objectives Reference Guide

- FL Priorities Goal C1, Obj. 1 / FL Priorities Goal C1, Obj. 2 / FL Priorities, Goal C3, Obj. 3 / FL Priorities Goal C2 Obj. 4.
- FDEP CRCP Conservation Goal B, Obj. 3 / FDEP CRCP Education & Outreach, Goal C FDEP CRCP Education & Outreach, Goal D, Obj. 1.
- SEFCRI LAS LBSP Issue 5 Goal.
- SE Coastal Oceans Taskforce Recommendations under "Water Quality" that relate to Yards, gardens and golf courses and Public education support this RMA.