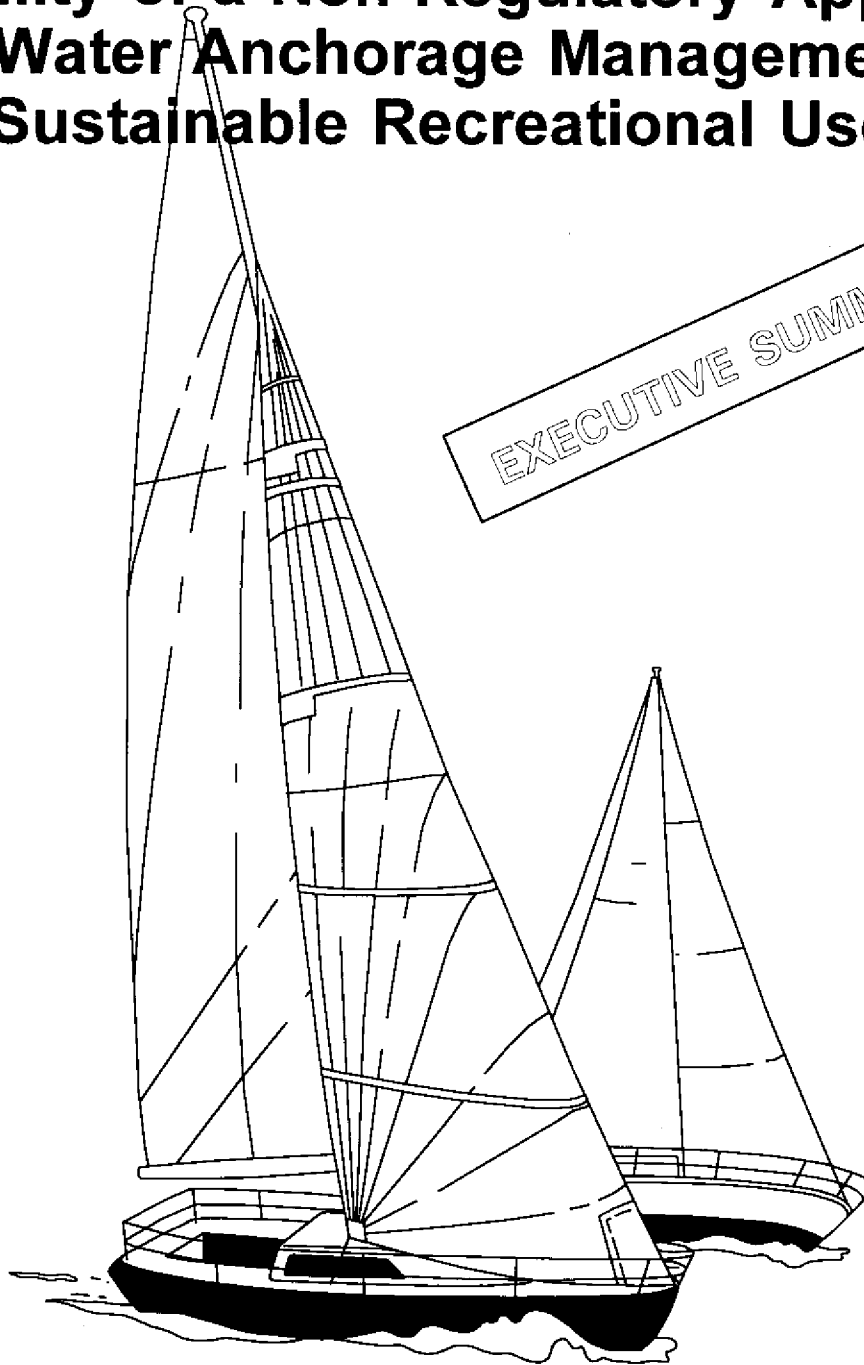


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EXECUTIVE SUMMARY



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Copies of the complete report, "Feasibility of a Non-Regulatory Approach to Bay Water Anchorage Management for Sustainable Recreational Use," including data on each anchorage in the survey, aerial photos, and a wealth of information resulting from the study will be available after June 15, 1994. The report is priced at \$12.00 and may be ordered from Florida Sea Grant, University of Florida, Box 110409, Gainesville, FL 32611-0409. Ask for TP-74 and make check payable to "University of Florida" (please include 6% sales tax).

Florida's southwest coast is characterized as a boater's paradise. Stretching from Tampa Bay on the north to Marco Island on the south, this region offers rewarding experiences in sailing, boating, and coastal or offshore cruising. Anchorages are an integral element of this boating environment for a large number of boaters.

Boating and fishing make a significant annual contribution, roughly \$500 million dollars (1993), to southwest Florida's regional economy. Principal among the growth management goals of local governments and citizens is maintaining the quality of boating and fishing experiences in the face of explosive population growth, coastal development, and a steady increase in the number of registered boats in the region.

In 1989, recreational boat registrations in southwest Florida totaled 74,538 -- a 309% increase since 1970. Projections estimate 97,628 pleasure boats in the region by the year 2000. Increased boating and the need to protect environmentally sensitive resources have focused attention on several boating issues, including recreational anchoring. Serious concerns about anchoring have emerged because of (1) discharge of sewage and disposal of trash, (2) conflicts with shoreline property owners, (3) general boating intensity, and (4) potential damage to bay bottom habitat.

Local governments have passed ordinances regulating anchored vessels. Recently, the U.S. Coast Guard has more broadly defined management of anchored vessels -- once considered a federal navigation rights issue -- to allow state or local government intervention for the purpose of protecting sensitive habitats, reducing degradation of water quality, and fostering equitable access by land and bay water users. The Florida Department of Environmental Protection is considering the need for regulation of anchorage areas to reduce environmental impacts. There is an urgent need to obtain objective information on these environmental impact issues and to provide public education and regionally coordinated policies on the locations, facilities, and appropriate uses of anchorages.

This project was designed to determine if a non-regulatory approach, using boater education about desirable anchoring locations and practices, would influence boater choices. Self-regulation is a policy alternative to the present array of inconsistent local ordinances which boaters face in transiting southwest Florida waters.

Boats

The target population for this project consisted of boats in the five county anchorage area (Manatee, Sarasota, Charlotte, Lee, Collier) and boats in 12 satellite counties (DeSoto, Glades, Hardee, Hendry, Hernando, Hillsborough, Lake, Monroe, Orange, Pasco, Pinellas, Polk) which use southwest Florida anchorages. There are 19,758 boats that potentially use recreational anchorages in southwest Florida (15,672 power; 4,086 sail). This represents 39% of all resident-owned and transient recreational boats with overnight accommodations in Florida. Seventy-nine percent are power boats and 21% are sail boats.

There are 3 power classes: fisherman (43%); express cruiser (36%); and trawler cruiser (21%). Average length of each class is 23 ft., 32 ft., and 37 ft., respectively; the overall average is 29 ft.

Anchoring sail boats are grouped in three boat classes: club racer/cruiser (50%); traditional cruiser (40%); and overnighter (10%). The average length of each class of sail boat is 33 ft., 36 ft., and 23 ft., respectively; the overall average is 33 ft.

Boat draft, a critical factor in determining access to southwest Florida anchorages, varies between power and sail boats. Ninety percent of power boats draw less than 4 ft., while 65% of sail boats have a deeper draft. The average power boat draft is 3 ft.; the average sail boat draft is 4 ft.

The principal forms of waste produced by recreational vessels are garbage and human waste. Garbage is collected predominantly in plastic bags. Half of power boaters retain garbage for 1 day or less before disposal; the other half collect and dispose of 2 - 3 days' accumulation. Only 12% of sail boaters retain garbage for 1 day or less; most (59%) dispose of 2 - 3 days' accumulation.

Disposal of sanitary waste may be by one or more methods: direct discharge overboard by flushing; holding tank storage and subsequent pump-out (dockside or overboard); portable toilet with land-side disposal; and/or on-board pre-treatment and discharge. A few power (16%) and sail (12%) boats have no alternative but to flush untreated sewage overboard. An equal number of power and sail boats (14% each) have on-board pre-treatment capability (macerator, chlorinator), and discharge treated waste. Other power (36%) and sail (20%) vessels have a holding tank without a Y-value, allowing discharge only to a dockside facility. One-third of all power and one-half of sail boats have a Y-value system which permits discharge of untreated sewage either to sea or to a dockside facility.

The mean sewage pre-treatment capability for recreational boats in Florida is estimated to be 30% reduction of the biochemical oxygen demand (BOD) of the sewage load, roughly equivalent to a primary sewage treatment plant. The remaining 70% of the BOD load of sanitary waste is degraded in the receiving waters. The peak waste loading by sail boats occurs during the low water temperature season when dissolved oxygen (DO) levels are high; the peak waste discharge from power boats occurs during the high water temperature season when DO levels are low.

Boaters

Sixty-eight percent of the region's overnighting boaters are 50 years of age or older. The dominant age cohort is 60-69 years, and a negligible number of individuals are less than 35 years old. Husbands and wives represent over 80% of anchoring boaters. Over half of all regional boaters have a college degree, and an additional one-quarter have completed some

college. The remainder have a high school or vocational school education.

Eighty percent of the boaters are equally divided into full-time employed and retired; another 20% are part-time workers. Over 60% have \geq \$50,000 household incomes, and one-fifth have \geq \$100,000 incomes. The profile of an average anchoring boater in southwest Florida is 56 years of age, white, male, anchors with wife, is college educated, partially or fully retired, and has a \$50,000 - \$74,999 annual income.

Three-quarters of all regional boaters consider anchoring an important or very important part of their boating experience. It is a social experience. Most boaters anchor with their spouse or a friend, less than one-quarter anchor alone. The companionship sought by the majority (70%), however, seldom or rarely extends to anchoring in the company of friends on other boats.

Anchoring is not a predominantly weekend activity. Over half of the boats anchor weekday, weekend or holiday; another 16% anchor exclusively during the week. The number of overnight anchorings per boat trip varies between power and sail boats. Most power boater trips include one overnight while most sail trips include two overnights. One-quarter of all power trips exclude any overnight anchoring.

Anchoring is a year-round activity for three out of four boaters. Another 25% anchor exclusively during the winter season. The principal anchoring period is October through June, and the peak period is March through May. On the average and over the year, sail boats anchor overnight 2.5 times more than power boats. This difference peaks during the winter months of November (3.5 times more), December (4.5), and January (4.0); it flattens out during the summer months of July (1.4 times more), August (1.2), and September (1.5).

Eighteen different anchoring reasons and eight drawbacks were identified. The primary reasons for anchoring are shared by both power and sail boaters: storm protection; bottom holding; scenic beauty; and tranquility. The principal two drawbacks (shore access, local restrictions) are also common to both power and sail boaters.

Anchorages

Forty-seven commonly-used recreational anchorages were identified by representatives of boating organizations -- boaters with extensive anchoring experience in southwest Florida. These sites vary greatly in physical characteristics and shoreside services. Anchorages are adjacent to five of the region's major passes. Most anchorages lie along the Gulf Intracoastal (GIW) and Inland (IW) Waterways, and the Caloosahatchee and Manatee Rivers.

Controlling depth, either along the approach channel or at the anchorage, determines accessibility by type and size of boat, which in turn affects site use. The initial criteria used in selecting the 47 anchorages gave preference to those sites with a controlling depth of \geq 5' in order to satisfy as wide as possible a range of potential boaters. An analysis of the relation

between power and sail boat draft requirements and controlling depth shows that 83% of the 47 sites accommodate 95% of the boaters.

Anchorage size determines the number of boats which can moor with adequate swing room; size ultimately affects site capacity. An initial reconnaissance survey estimated the number of average-size vessels which each anchorage could accommodate under normal weather conditions. Half of the sites are small, permitting 10 or fewer vessels suitable room. Another one-third are of intermediate size (11-20 vessels), and the remainder can accommodate 21-75 vessels. The large number of small anchorages distributed throughout the region, and the relative absence of intermediate or larger capacity anchorages (for example, between Sarasota and Charlotte Harbor) may foster congestion during peak use periods.

The average distance between anchorages on the GIW is 4.85 miles. This statistic, however, obscures the fact that there are trip segments where site conditions at specific anchorages (controlling depth, limited anchoring area, and exposure) may discourage anchoring.

The primary anchorage quality elements are storm protection, bottom holding, scenic beauty and tranquility. The 14 secondary quality elements are principally shore services -- infrastructure and use-related.

One-fifth of the 47 anchorages are high quality; two-thirds are intermediate, and the remainder are low. The number of sites with dissimilar primary/secondary ratings exceeds that of similarly rated ones. Quality ratings provide site specific evaluation criteria for anchorage selection. Along with controlling depth and anchorage size, they offer baseline information upon which planning and management guidelines can be developed.

Safety issues (such as anchorage size and location, approach channel depth, anchorage water depth, bottom holding) were preeminent decision variables; over 90% of the boaters considered these important. Whether or not to anchor or boat in an area was a decision based on environmental concerns in 75% or more instances. Specific environmental criteria considered were the presence or absence of seagrasses, and speed restricted zoning for manatee protection. Availability of shore services (such as dinghy access, pump-out, garbage disposal) represented anchoring decision criteria for approximately two-thirds of the boaters. Differences in responses between power and sail groups were negligible.

Accessibility is a prime consideration in site selection: Is an anchorage location within range (both travel time and distance) for a given outing? Other criteria, such as site quality, become important in the boater's selection, especially if more than one accessible choice exists. Since site use-intensity is a function of the traffic network (origins of boats potentially visiting anchorage destinations, and trip dimensions), then more anchorages should be located closer to the larger concentrations of boats.

Over half of all anchoring-type power and sail boats in southwest Florida are within

typical one or two overnight-length trips of sites from Longbeach/Longboat Pass northward. Forty percent of the power boats are within range of anchorages from Longboat (north) to Useppa (south). Anchorages south of Sanibel have the least potential number of anchoring boats. Port Charlotte and Punta Gorda, on Charlotte Harbor 20 miles from the GIW, have reduced numbers of potentially anchoring power and sail boats. Yacht Club Colony and Power Plant Slough are far enough up the Caloosahatchee River to reduce potential sail boat visits.

Collier County anchorages (Naples City to Capri Pass) potentially draw an overwhelming percentage of their power and sail boats from Lee County. In contrast, Lee County anchorages potentially draw the greatest percentage of anchoring vessels from within the county; this reflects the county's large number of power and sail boats, and its extensive bay water areas, including the Caloosahatchee River, San Carlos Bay, Pine Island Sound, and the southern portion of Charlotte Harbor.

Potential anchorage use by Charlotte County boats, locally and regionally, is lower. Lee County boats effectively reach north to Venice. Sarasota and Manatee anchorages show potential incursions of boats from Hillsborough and Pinellas counties; Pinellas power and sail boats could represent 30-40% of anchoring vessels at all Manatee County anchorages. There are potentially more out-of-state power than sail boats region-wide, except for Sarasota County anchorages. These data show the 47 anchorages in the five county area as a network of related sites, interconnected by a waterway system, and drawing anchoring power and sail boaters from across the southwest Florida region.

There were five anchored vessels, on the average, at an anchorage during the January 1 through April 30, 1993 period. Slightly over half of all anchorages had very low use (≤ 5 boats); one-fifth had low use (≥ 6 and ≤ 10 boats). Less than 10% had medium to high use; these included Matanzas Pass (high), Sarasota (high), Roosevelt Channel (medium), and Pelican Bay (medium).

A more accurate measure of use intensity is the relation between anchorage size and boat population. Boat crowding occurs when the number of anchoring boats exceeds the number of vessels which can moor with adequate swing room at a site. Crowding occurred at 12 anchorages over 46 days during the period. Boca Grande ranked the highest of all crowded sites. High weekday crowded locations were Captiva Pass and Gordon Pass; high weekend and holiday crowded sites were Longbeach and Englewood Beach.

How well do primary and secondary site quality ratings correspond with average use? Which anchorages are being over-utilized by boaters relative to site quality conditions, as defined by the boaters' 18 reasons for anchoring? Anchorages which scored higher use than primary and secondary quality ratings were: Ft. Myers Beach, Roosevelt Channel, and Sarasota. Anchorages with only higher use than secondary quality ratings were: Naples City, Glover Bight, Boca Grande, and Manatee River/Pt. DeSoto.

Shore Residents

Shore residents directly impacted by the presence of anchoring boats are those who live, or whose business lies, along the shoreline adjacent to an anchorage. Their scenic views, security, general enjoyment of the locale, and sometimes their level of business activity, are affected by the appearance, activity and density of anchored boats and boaters in the immediate vicinity.

Noise is the main problem and personal watercraft (jet skis) are overwhelmingly responsible. Crime is the second most important problem, with perceived responsibility somewhat uncertain and spread over several groups, including recreational and commercial fishermen. Boat traffic is the third most important problem and all boater groups are contributors. When the 3 most important problems (i.e., noise, crime, traffic) are considered, the perceived boating groups responsible in ranked order are: personal watercraft operators (59%); recreational power boaters (57%); commercial fishermen (50%); recreational fishermen (46%); recreational sail boaters (36%); type uncertain (26%); and live-aboards (26%).

Shore residents consider a series of problem issues to be associated with anchorage use. Some of the boating groups perceived to be responsible are not engaged in recreational anchoring (e.g., personal watercraft operators, live-aboards, commercial and recreational fishermen, speedboaters). Some of the so-called "anchorage problems" are related to non-recreational boaters and non-anchoring activities.

Guidebook and Maps

A guidebook and large-scale maps were field-tested for effectiveness in influencing voluntary boater choices of anchorage locations. It was reasoned that identifying and illustrating sensitive bay habitats, shore features and shore services, in guidebook and map form, could enable boaters to select sites that balanced adequate provision of safety, personal requirements and shore services, with adequate protection of marine resources.

The guidebook's impact on anchoring decisions was positive: half or more of the volunteers were influenced to try new anchorages. Perceived negative impacts, such as overcrowding (due to publicity from the guidebook), were considered negligible. Over half of the boaters used the guidebook to select sites based on channel depth; fewer than half used it for information on storm protection. Very few boaters (<10%) used the guidebook to select anchorage sites for shore services. By influencing the decision of more than 50% of boaters regarding where to anchor, the guidebook demonstrated itself as a potentially useful tool of persuasion to mold boater awareness.

Survey responses showed that two-thirds of all boaters required large-scale anchorage maps at the test map scale ($\geq 1:2400$). Boater suggestions guided the design and compilation of six large-scale maps of anchorages illustrative of the range of bottom sediment/vegetation

type, waterfront use, and shore service conditions found at the 47 anchorages in the region.

Towards a Regional Policy for Managing Anchorages

Anchoring is a multidimensional issue. As the number of anchoring boats and other boating activities have increased alongside residential shore development, anchoring boaters have had to share the limited number of "anchorage quality" sites with other types of boating activities and with shore residents. Anchoring boaters are concerned primarily with storm protection and vessel safety, though scenic beauty, shore access and services are also important reasons for selecting one anchorage over another. Shore residents focus on preserving the privacy of their homes and tranquility of their waterfront environment. Their view of an anchorage includes all boating users, such as jet skiers, commercial and recreational fishermen, recreational and residential (live-aboard) anchorers. Anchored boats may or may not be responsible for the perceived problems of wake, noise, crime, pollution, traffic, and trespassing. Furthermore, the intensity of the anchorage problem may vary from site to site.

The growing number of confrontations between shore residents and boaters over this "anchoring conflict," along with a growing concern over environmental impacts, prompted Florida in 1991 to pass a rule broadening the state's mandate to govern the use of sovereign submerged lands by anchoring vessels. The Florida Department of Environmental Protection was given authority to write uniform anchoring regulations. Concurrently, an Office of Waterway and Vessel Management was created to address waterway problems.

Since 1991, a blue-ribbon Boating Advisory Committee has been formed and public meetings held statewide in coordination with boaters' advocacy and shore resident groups. These meetings fostered a growing consensus that an opportunity exists to examine various anchorage management options that protect the historic rights of navigation for recreational boaters, while promoting water quality and conservation of sensitive marine habitats, and allowing for harmonious sharing of anchorage resources by boaters and shorefront residents.

This study provides the baseline information -- on boaters, anchorages and shore residents -- needed to formulate policies and draft management strategies. Three initiatives would be required to implement an effective regional policy. They are:

(1) **Educate the public.** A non-regulatory approach to anchorage management implies that boaters can make wise choices on where and how to anchor, with minimum negative impact on the bay environment and shorefront communities. There is a need for an active, ongoing program of information and education directed at all affected citizens and groups.

A wise choice can be made, only if (a) information on bay water and waterfront resources is available, and (b) the boater is aware of the negative impacts a poor use choice has on the quality of the recreational experience. The project's guidebook and large-scale anchorage maps are important first steps of such a boater education initiative. The prerequisite for success is education of all members of the group on how to achieve group

and individual goals without infringing on others.

(2) Inventory and monitor resource use.

Resource inventorying provides baseline information to characterize the present state of the anchorages and to measure user pressure and ecological vulnerability. It may point out areas where anchoring should be restricted because of potential damage to sensitive marine habitats, as well as areas with minimum environmental risk where anchoring could be encouraged.

One type of impact is damage to productive seagrass habitat, by dragging anchor, running aground, and through shading associated with long-term mooring. Another type of impact is degradation of water quality by the discharge of untreated human waste. There is a need to determine the extent to which these impacts occur.

Decline in quality must be detected if the environmental and aesthetic characteristics of anchorages are to be maintained for sustainable recreational use. Decline may be caused by changes in anchoring and other boating activities, or by shore use. Monitoring anchorage use and environmental status can assist in identifying congested or overcrowded conditions, a prerequisite to determining the carrying capacity of the site.

(3) Manage anchorages. Anchorage management should be regional in scope to eliminate the problems of approaching the anchoring issue from a local jurisdictional viewpoint. Local ordinances fail to relate anchorages in the locale to anchorages in adjoining jurisdictions. Furthermore, local ordinances do not distinguish between anchorage sites; all bay waters are treated the same. There is no attempt to restrict anchoring over sensitive marine habitats, or to allow it in non-endangered areas.

Anchorage policy should require regional coordination among local governmental jurisdictions to ensure initial and continuing implementation with a minimum of contradiction. Policy should seek to establish a non-regulatory management system, with an on-going process of internal and external education, to ensure that the goals of boaters anchoring in southwest Florida, the goals of agencies responsible for managing the public trust, and the goals of citizens potentially concerned with or impacted by anchoring activities, can be balanced to their mutual satisfaction. Self-regulation by a special interest community, within a forum where all who have vested interests in the issue can participate in mediated discussion, is a traditional and accepted form of conflict resolution.

Recommendations:

1. Publish a general information release summarizing site quality characteristics of the 47 anchorages. Distribute to anchorage users as a Sea Grant Extension Bulletin.
2. Inventory and map the high use-intensity anchorages and those sites where the volunteer survey indicated boater map needs. Map marine vegetation, bottom sediments, bathymetry, shore access, waterfront use, and boating facilities.

3. Publish and distribute maps to boaters, shore residents, and resource managers.
4. Prepare and publish eco-tourism supplements to the guidebook and large-scale maps, to explain unique aspects of the anchorage environment, such as site development, bay bottom characteristics, historic and current shore use.
5. Monitor the high use-intensity anchorages to determine use type (anchoring, skiing, fishing, boating), use levels (weekday, weekend, holiday, season), use pattern (within anchorage, between anchorages), and use conflicts (among boaters, between boaters and shore groups). Evaluate changes in site quality. Determine site carrying capacity. Develop site specific use-standards for anchorage management.
6. Design model anchoring guidelines that can be accepted by authorities with responsibility for anchorage management; that can be implemented by boaters and shore residents; and that can fully comply with federal statutes and codes, and with the public trust doctrine.
7. Develop a public information program to reach shore community groups and encourage their full participation in the formulation of anchorage management strategies.
8. Create a local management structure, such as harbor boards, to administer anchorages at the county and municipal levels using model anchoring guidelines. Boards should be made up of a cross-section of the local shore community, boater groups, and government representatives, to be appointed locally and to serve voluntarily.
9. Establish a regional coordinating framework for anchorage management, through the Southwest Florida Regional Planning Council's Anchorage Advisory Committee, to ensure coordination between local harbor boards and to maintain consistency with state and federal standards.

End