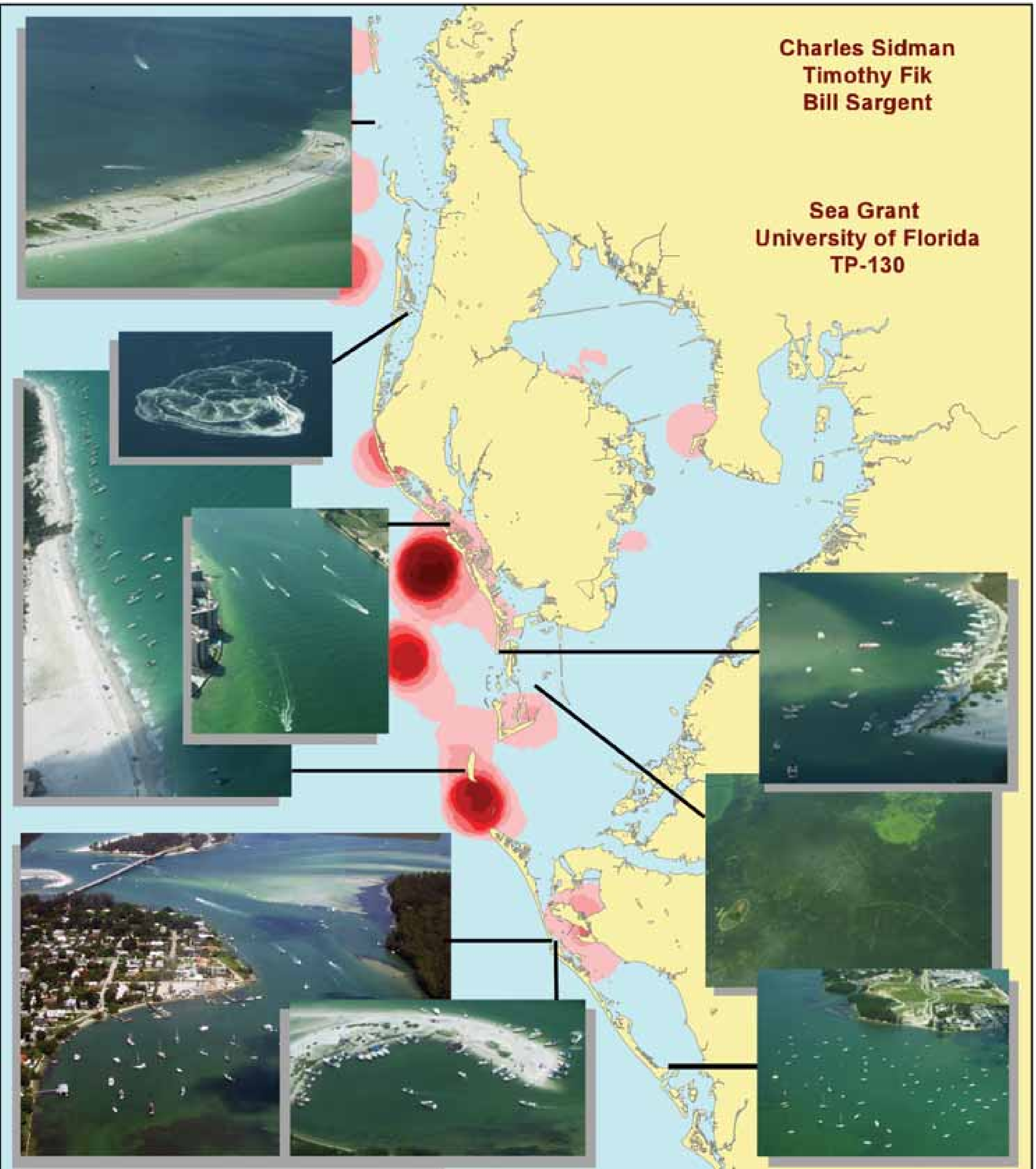
A Recreational Boating Characterization For Tampa and Sarasota Bays



Charles Sidman
Timothy Fik
Bill Sargent

Sea Grant
University of Florida
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by

Charles Sidman
Coastal Planning Specialist
Florida Sea Grant
University of Florida

Timothy Fik
Associate Professor
Department of Geography
University of Florida

Bill Sargent
Research Scientist
Florida Fish and Wildlife Conservation Commission
Florida Marine Research Institute
St. Petersburg, Florida

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Acknowledgments

The Florida Fish and Wildlife Conservation Commission Florida Wildlife Research Institute (FWRI) partially funded this project through a grant from the Florida Department of Environmental Protection Florida Coastal Management Program (FDEP FCMP) pursuant to National Oceanic and Atmospheric Administration (NOAA) award number NA17OZ2330.

The success of this project relied upon the individual contributions of various team members. Principal Investigator Charles Sidman (Florida Sea Grant) was responsible for project administration, overall design of the questionnaire and correspondence, sample selection, GIS database design, and content analyses. Timothy Fik (Department of Geography, University of Florida) performed the statistical analyses. Bill Sargent (FWRI) served as project liaison, contributed to the questionnaire design, and was responsible for the questionnaire map layout and design. Larry Bearse (Florida Sea Grant) conducted the marina survey, and along with Debbie Leffler and staff at FWRI, conducted the ramp surveys. Richard Sullivan and staff at Hillsborough County conducted surveys at the Cockroach Bay Road boat ramp. Dick Tudor and James Harrison of Smart Mail Inc. (Alachua, Florida) implemented the mailing. Jennifer Leach and Susan Fann managed and processed attribute and spatial data from the returned questionnaires. We especially thank the many Tampa and Sarasota Bay boaters who donated their time to complete and return the questionnaire. It is our intention that this effort will be translated into planning strategies and informational products of benefit to the Tampa and Sarasota Bay boating communities.

Introduction

Background

Boating is a key element in Florida’s coastal lifestyle and growth phenomena. Florida currently ranks third in the nation in recreational boat registrations, with more than 900,000 pleasure boats registered or titled, according to the Florida Division of Highway Safety and Motor Vehicles Vessel Registrations 2003 database. This represents approximately one boat for every 17 residents. More importantly, with over 22 million estimated participants, Florida is ranked the number one destination for marine recreation including saltwater boating with an estimated 4.3 million participants in the United States (Leeworthy and Wiley, 2001). The ever-increasing number of boaters and the diversity of recreational boating activities that now take place within Florida’s coastal bays, estuaries, and waterways have had positive economic but negative environmental consequences (Leston, 2002; Antonini, Fann and Roat, 1999). Florida’s coastal counties face a major planning dilemma; how to balance growth in boating and associated coastal development with conservation and management of estuarine resources.

As demand for use of Florida’s waterways increases, so does the need for enhanced public access, public safety, and environmental protection. There is, however, little information available to resource managers and planners that describes the preferences and patterns of the boating community. This study builds upon previous work conducted in the Charlotte Harbor boating region (Sidman and Flamm, 2001) by refining the questionnaire design, developing a sample selection method to target specific boater-groups, and implementing a mail survey to characterize boater preferences, activities, and water-use patterns for the high-use boating region that includes Tampa and Sarasota Bays. Information obtained from this study will enhance resource management and planning applications and contribute to educational products that can improve boating experiences and encourage resource stewardship.

This report documents the data collection, compilation, and analysis of a mail survey to characterize recreational boating in Tampa and Sarasota Bays. It presents (1) the questionnaire and related correspondence; (2) the sample design and results of the mail-out; (3) a GIS density analysis that depicts the spatial distribution and clustering of trip information reported by survey respondents; (4) a density analysis of spatial boating patterns by user group, activity, draft, and boat type; and (5) a set of descriptive statistics that characterize boating groups, activities, and perceived problems, solutions to problems, and information requests.

Study Goal and Objectives

This project’s goal was to characterize the preferences, activities, and water-use patterns of boaters on the basis of trip origin type (i.e., marina wet-slip, dry storage facility, ramp, or private dock) and geographic sub-region (i.e., Tampa Bay or Sarasota Bay). Specific objectives included (1) developing a survey instrument and accompanying correspondence; (2) identifying target boater groups by trip departure type; (3) implementing a mail survey of a random sample of target boater groups; (4) constructing spatial databases that identified trip departure sites, destinations, travel routes, and congested areas; and (5) developing a database structure to link boater activities, preferences, and trip-profiles to the spatial databases.

Study Region

The Tampa and Sarasota Bay study region extends approximately 60 miles from Anclote Key in the north to Big Sarasota Pass in the south, in Pinellas, Hillsborough, Sarasota, and Manatee counties (Figure 1). Recreational boaters are attracted to this region by its many barrier islands and protected waters that provide excellent opportunities for small-craft fishing, nature viewing, and picnicking/socializing along barrier island beaches and exposed sand spits (Figure 2). The study region comprised roughly 550 square miles of interior bay waters that includes the Manatee River, and 500 square offshore miles to account for the many trips to artificial reefs in the Gulf of Mexico.

An estimated 125,000 pleasure boats are currently registered in the study region (Table 1), an 87 percent increase, on average, since 1980 (Florida Bureau of Economic and Business Research, 1980; Florida Department of Highway Safety and Motor Vehicles, Vessel Title Registration System Database, 2004). This number does not include the many thousands of vessels brought into this region each year by visitors.

Table 1. Registered Pleasure Boats by County: Sarasota and Tampa Bay Regions.

Region	County	1980	2004	% Increase
Sarasota Bay	Sarasota	12,893	22,654	100
	Manatee	8,835	18,857	113
Tampa Bay	Hillsborough	28,009	43,745	56
	Pinellas	28,186	49,859	77

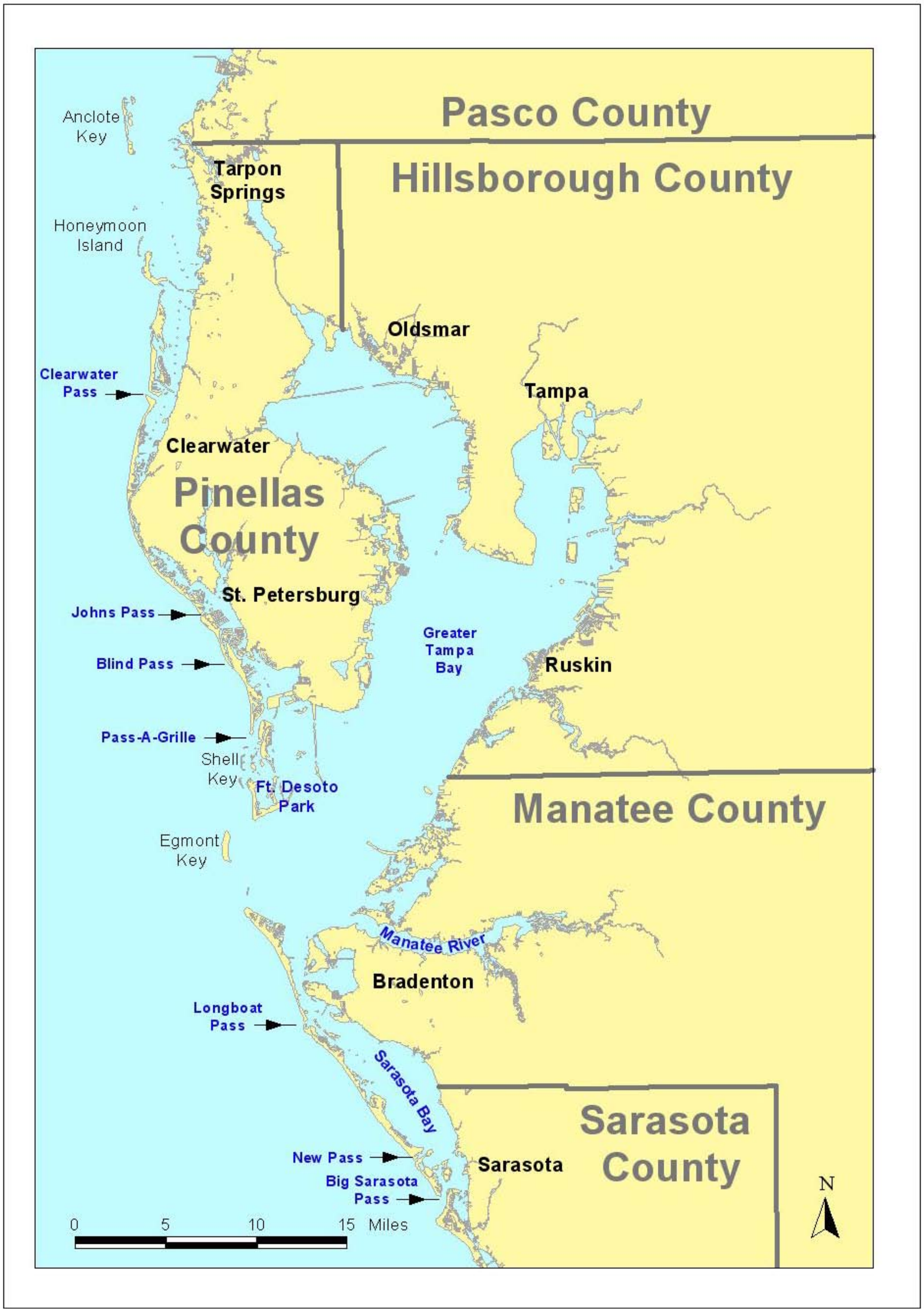

Figure 1. Tampa and Sarasota Bay Study Areas.

Figure 2. Popular Boating Destinations.

Mail Survey

Survey Instrument

The mail survey is an established method for acquiring spatial and behavioral information from the perspective of the boating community (Antonini, Zobler, Sheftall, Stevely and Sidman, 1994; Antonini, West, Sidman and Swett, 2000; Falk, Graefe, Drogin, Confer, and Chandler. 1992; West 1982). A mail survey distributed to a randomly selected group is preferred over focus interviews with experts or convenience sampling (e.g., interviews at launch ramps), because it is proven to capture a wider and more representative cross-section of a population (Dillman, 1978; 1991). This is especially true of a boater population that is known to be diverse in terms of activities and/or characteristics (Sidman, Antonini, Sauers, Jones, and West, 2000). In addition to reducing the potential for sample bias, a mail survey offers greater flexibility to obtain both spatial and behavioral information than methods of strict observation such as aerial surveys (Sidman and Flamm, 2001).

The survey questionnaire developed for this study was patterned after similar, previous studies (Falk et al., 1992; Sidman and Flamm, 2001; West, 1982;) and was designed to (1) capture spatial information regarding trip departure sites, favorite boating destinations, intervening travel routes, and congested areas; (2) characterize boaters with respect to types of vessels owned and used, activity preferences, and the timing, frequency and duration of their recreational outings; and; (3) identify problems, solutions to problems, and information needs from the perspective of the boating community (see Appendix A for the survey instrument and associated correspondence).

The survey instrument was a two-sided 17 X 22 inch questionnaire that folded in quarters to 8.5 X 11 inches. The questionnaire contained a map (1:160,000 scale; 1 inch is about 2.5 miles) of the Tampa Bay and Sarasota Bay region on one side, and a series of questions on the reverse. Questions were divided into the following five topical areas:

1. Description of primary and secondary vessels
2. Description of last two pleasure boating trips
3. Description of favorite boating destinations and activities
4. Description of survey respondent
5. Questions to identify perceived problems, solutions to problems, and information needs.

The following associated correspondence was included with each mailed questionnaire.

1. A cover letter explaining the study
2. A Florida Sea Grant publication entitled “A Tackle Box Guide to Fish in Southwest Florida”
3. A 4 X 6 card (postage paid return) that will allow each survey recipient to receive the latest edition of a Boaters’ Guide to Tampa Bay
4. A Florida Sea Grant Boater Product Fact Sheet
5. A postage paid return envelope with postal permit indicia
6. A mailing envelope that included return address and postage permit indicia

A beta-version of the survey instrument was mailed to 12 individuals identified through the local Sarasota Bay and Tampa Bay Power and Sailing Squadrons who agreed to review and complete the questionnaire. Reviewer comments and suggestions were used to improve the content of the questionnaire.

The questionnaire asked survey recipients to mark, on the map, the location of the trip departure site, travel routes, favorite destinations, and congested areas associated with their last two pleasure boating trips. Complementary questions allowed recipients to characterize their last two trips according to vessel type, the departure date and time, and time spent on the water. In addition, recipients were asked the number of days per month that they take “typical” trips and the primary activities that they engaged in while at a particular destination. They were also asked to identify and rank reasons for selecting departure sites, travel routes, and favorite destinations. Finally, a series of open-ended questions addressed problems, needed improvements, and the kinds of information that would enhance recreational boating experiences.

Sample Design

The sample design was developed to acquire group-specific information that can be used to compare and contrast use-patterns among four discrete boater populations that actively use the Tampa and Sarasota Bay region: Users of (1) marina wet slips, (2) dry storage facilities, (3) public ramps, and (4) private docks. The sampling design allowed for the acquisition of independent random samples for each of the four boating populations defined above. Each boater sample was further stratified by geographic sub-region (e.g., Tampa Bay or Sarasota Bay).

This sample design was developed in response to the demonstrated need for group-specific boater information. For example, spatially explicit boater information is necessary to satisfy important elements of local manatee protection plans that recommend an analysis of boating patterns and an assessment of marine facility uses, needs, and infrastructure siting (Sarasota County Manatee Protection Plan, 2003). In addition, a recent study by Riley and Stead (1999) concluded that certain boater-groups (e.g., users of commercial marina and storage facilities) shoulder an unwarranted regulatory burden for environmental impacts. Riley and Stead argue that single family docks and boat ramps represent over 90% of the boat traffic and are associated with the greatest amount of non-compliance and manatee mortality. The authors argue that policies and regulations such as speed zones and restrictions on the expansion of existing commercial boating facilities or the construction of new commercial boating facilities are, therefore, misdirected by improperly targeting user-groups least responsible for environmental impacts. Riley and Stead highlight the importance of differentiating between user-groups, boat composition, and waterway access type - defined as trip departure origins in this study - in the analyses of traffic generation and subsequent environmental impacts. Their analysis was limited, however, in its ability to quantitatively link resource pressure and impacts to specific user-groups. This was due, in part, to the inadequacy of their data to fully and objectively capture use profiles of discrete boater groups.

Sample Size Determination

The sample size required for each of the four boater-groups is a function of the desired confidence interval and confidence level. Given a total population of finite size, N, a tolerable error amount, e, and a desired confidence level as specified by the normal random variate, z, the required sample size, n, for estimating a population proportion, p, is determined by:

$$n = \frac{N z^2 p(1-p)}{(N-1)e^2 + z^2 p(1-p)}$$

A minimum sample size of 384 was required for each of the four boater-groups, based on a tolerable error of +- .05 and a confidence level of 95 percent (z = 1.96). This sample size was considered adequate, at the stated error and confidence level, for a population that is finite and does not exceed 2,000,000 (McCall, 1982). A gross sample of 2,000 boaters for each of the four categories was targeted to ensure obtaining 384 returns for each boater-group. This ratio assumes a return rate of approximately 20 percent, based on return rates from previous surveys of southwest Florida boaters (Antonini et al., 1994, 2000; Sidman and Flamm, 2001).

Sample Selection

Vessel and boat trailer registration numbers collected at area marinas and boat ramps were used to obtain names and mailing addresses from the State's Vessel Title Registration System (VTRS), maintained by the Florida Division of Highway Safety and Motor Vehicles (DHSMV) for the marina wet slip, marina dry storage facility, and ramp samples. The names and addresses of owners of documented vessels were obtained from the United States Coast Guard Documented Vessel database that is available on-line. Names and mailing addresses for waterfront parcel owners obtained from County tax records were compared to the VTRS to identify the dock sample (i.e., those waterfront parcel owners who also owned a boat).

Marina Sample

Florida Sea Grant personnel logged the vessel registration number or the vessel name and hailing port of 5,317 vessels at a sample of 75 marinas in Sarasota, Manatee, Hillsborough, and Pinellas counties during April and May 2003 (Figure 3; Appendix B). Access to wet-slips and/or dry-storage facilities was denied at an additional 19 marinas (Appendix B). A total of 3,075 and 2,242 vessels were surveyed in marina wet-slips and in dry-storage facilities, respectively. Vessel registration numbers recorded from 3,894 boats were matched with VTRS records to obtain the names and mailing addresses of boaters who keep their vessels in marina wet-slips or in dry-storage facilities. In addition, the vessel name and hailing port of 1,423 documented vessels were also obtained and used to identify owner names and addresses from the United States Coast Guard documented vessel database, available on-line.

In many instances, a bow number or a name and hailing port match could not be established with the VTRS or United States Coast Guard databases. Furthermore, name and

Figure 3. Prominent Marinas Surveyed.

mailing information for a number of VTRS bow number matches was unavailable (e.g., many individuals request that their personal information not be made public). Notwithstanding, the number of surveyed vessels was sufficient to select a sample of 1,000 marina wet-slip and 1,000 dry-storage users for Tampa Bay. This target sample size was not met for the Sarasota Bay region. Sarasota Bay marina wet-slip and dry-storage boater samples were smaller, due, in part, to the comparatively small number of these facilities in the area. However, the Sarasota Bay wet slip (N = 587), and dry storage facility (N = 505) samples are considered proportionate to the Tampa Bay samples, given the relative differences in the number of boating facilities and registered boaters between the two regions.

Ramp Sample

During 2003 - 2004, FWRI field crews periodically visited 19 Tampa Bay ramps and logged the registration tag numbers from 1,991 vessel trailers (Figure 4; Appendix B). During June 2003, a complementary survey at 10 popular Sarasota Bay ramps by FSG personnel (Appendix B) yielded information on 1,733 boat trailers. Vessel trailer registration numbers were compared to the VTRS database to provide names and mailing addresses for the Tampa Bay (N = 1000) and Sarasota Bay (N = 722) ramp samples. Again, the Sarasota Bay sample is smaller than that for Tampa Bay, but is considered proportionate, given the relative differences in the number of ramps and registered boaters between the two regions.

Residential Dock Sample

A sample of dock owners (e.g., single-family and condominium residences) was selected by matching the mailing address in the VTRS to the address of waterfront parcel owners identified from Sarasota, Manatee, and Hillsborough county property tax records. Shoreline data were used to select waterfront parcels, within a GIS, for Sarasota, Manatee, and Hillsborough counties. Tax assessor's information, which included the owner's name and mailing address, was linked to each waterfront parcel. The Pinellas County tax assessor provided pre-selected waterfront parcel information in a non-spatial format: ASCII tab delimited. The Pinellas County parcel identification number included section, township, and range information, which was sorted and used to select an even geographic distribution of waterfront parcel owners.

The owner's name, street number, street name, and zip code obtained from county tax records were combined and compressed (i.e., no spaces) into one concatenated field. A similar compression procedure was undertaken for VTRS owner name, address, and zip code fields. Compressed name and address information for all waterfront parcels was then linked to the corresponding compressed VTRS information to identify matches. Such matches made certain that only those waterfront parcel owners who also owned a currently registered boat were sampled (Figure 5). Matching records were then sorted by parcel centroid latitude and longitude, and by section, township, and range for Pinellas county, to ensure that a spatially even distribution of dock owners - 500 in each of the four counties - was sampled throughout both Tampa Bay and Sarasota Bay regions (Figure 6). A program stepped through matched records for each County and selected every n^{th} record, up to N = 500, depending upon the total number of matches per county. For example, the program would select every 4^{th} record for a county with 2000 tax assessor/VTRS address matches.

Figure 4. Public Boat Ramps Surveyed.

Figure 5. GIS Process for Selecting the Residential Dock Sample (South Sarasota Bay).

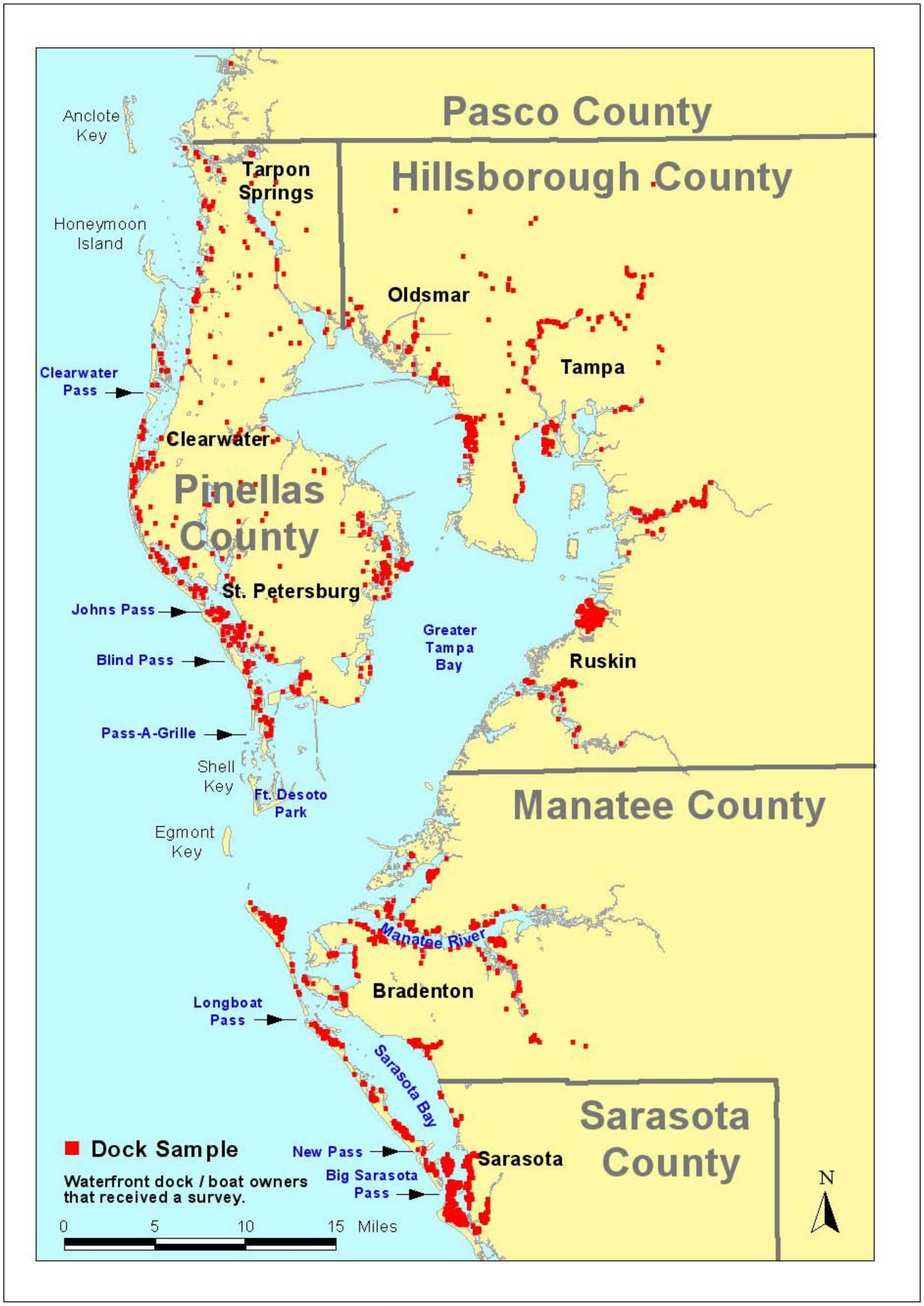

Figure 6. Residential Dock Sample.

Survey Return Breakdown

A breakdown of survey mail-outs and returns is presented by boater-group (i.e., marina wet, marina dry, ramp, and dock) and geographic sub-region (i.e., Tampa Bay and Sarasota Bay) in Table 2. In the table, 'gross' refers to the total number of surveys that were mailed; 'net' adjusts the 'gross' mailed-out calculation to account for names and addresses that could not be validated by the U.S. Postal Service, and for surveys returned by the U.S. Postal Service as undeliverable; and 'return' stands for the number of questionnaires that were completed and returned by survey respondents. The targeted gross sample of 2000 (e.g., Table 2: Sarasota Bay gross plus Tampa Bay gross) was not achieved for some boater groups (e.g., Sarasota Bay marina wet, marina dry, and ramp categories) due to the comparatively small number of ramps, marinas, and boat storage facilities in the Sarasota Bay area. Nonetheless, the number of returned surveys still exceeded the target number of 384 for each boater-group.

Thirty-six addresses could not be validated; 192 questionnaires were returned by the U.S. Postal Service as undeliverable; and 1,908 individuals completed and returned a questionnaire. This translated to an overall return rate of 29%. More importantly, a proportionate survey return ratio exceeding 20%, or 384 returns, was maintained for each boater-group. A supplemental mailing of letters to remind survey recipients to complete and return questionnaires was, therefore, deemed unnecessary.

Table 2. Survey Mailings and Returns by Boater-Group and Geographic Region.

Boater-Group	**Sarasota Bay Surveys**			**Tampa Bay Surveys**			**Total* Surveys Returned**	**% Returned**
	Gross	Net	Returned	Gross	Net	Returned		
1. Marina (Wet)	586	561	177	1000	961	295	**472**	32
2. Marina (Dry)	505	486	133	1000	976	256	**389**	27
3. Public Ramp	722	670	170	1000	952	269	**439**	27
4. Private Dock	1000	984	329	1000	995	279	**608**	31
TOTALS	**2813**	**2701**	**809**	**4000**	**3884**	**1099**	**1908**	**AVG = 29**

GIS Database Development

Spatial Database Design

Questionnaire recipients were asked to mark the start and end point of their last two pleasure boating excursions and trace their entire travel routes on a map, as well as to identify their favorite boating destinations and annotate the map with the primary activities that they engaged in while at a particular destination. Data collected from 1,798 surveys were digitized into the ESRI ArcView geographic information system (GIS). Spatial information was either not reported by survey respondents or could not be interpreted from 110 of the returned surveys. This translated to a sample of 3,508 travel routes, 3,508 trip departure sites, 5,212 favorite boating destinations, and 1,635 areas of perceived congestion.

Spatial information was digitized 'on-screen' using a 1:24,000 scale shoreline and the positions of marinas, ramps, navigation aids, and artificial reefs, as background themes, to enhance the accuracy of digitized data. Trip departure sites and congested spots were digitized as point features with each record coded with the survey control number and the trip number (i.e., first or second trip). Favorite destinations were digitized as point features and were coded with the survey control number, the trip number (i.e., first or second trip), and the activities that a respondent engaged in at each favorite destination. Travel routes were digitized as line features with the following attribute information coded: Survey control number, trip number (i.e, first or second trip), round trip (or one way); if round trip, then the same route out and back, and whether or not the trip extended beyond the study area.

The database structure allowed information from survey questions to be 'linked' to digitized spatial information by the use of the survey control number (ID), which uniquely identified spatial and attribute information provided by each survey respondent. The selection and display of favorite destination point data within the GIS is illustrated in Figure7. A close-up of the southern Tampa Bay boating region is displayed in the GIS view. Red dots represent departure sites identified by survey respondents; green dots represent favorite destinations; yellow dots represent a sub-set of favorite destinations where survey respondents reported that they like to "nature view." The 'Select by Attributes' window - upper left corner of Figure 7 - illustrates a GIS database query that selects and displays those favorite destination points that are associated with nature viewing (e.g., NV = "Y"). The 'Selected Attributes of Destinations' window - lower left corner of Figure 7 - displays all 'linked' database records in yellow. These records share the same survey control number (ID) that meet the query criterion of nature viewing (NV). As can be seen in the resulting GIS view, Egmont Key is a prime reported destination for nature viewing.

Reported travel routes within the southern Tampa Bay boating region are displayed in Figure 8. The mass of pink lines represent travel routes digitized from returned surveys; red and green dots illustrate departure sites and favorite destinations, respectively. The blue lines depicted in the GIS view represent two travel routes that have been selected for display. The corresponding database records that are 'linked' to the two travel routes via the survey control number ID are highlighted blue in the 'Attributes of Routes' database window - lower left of Figure 8.

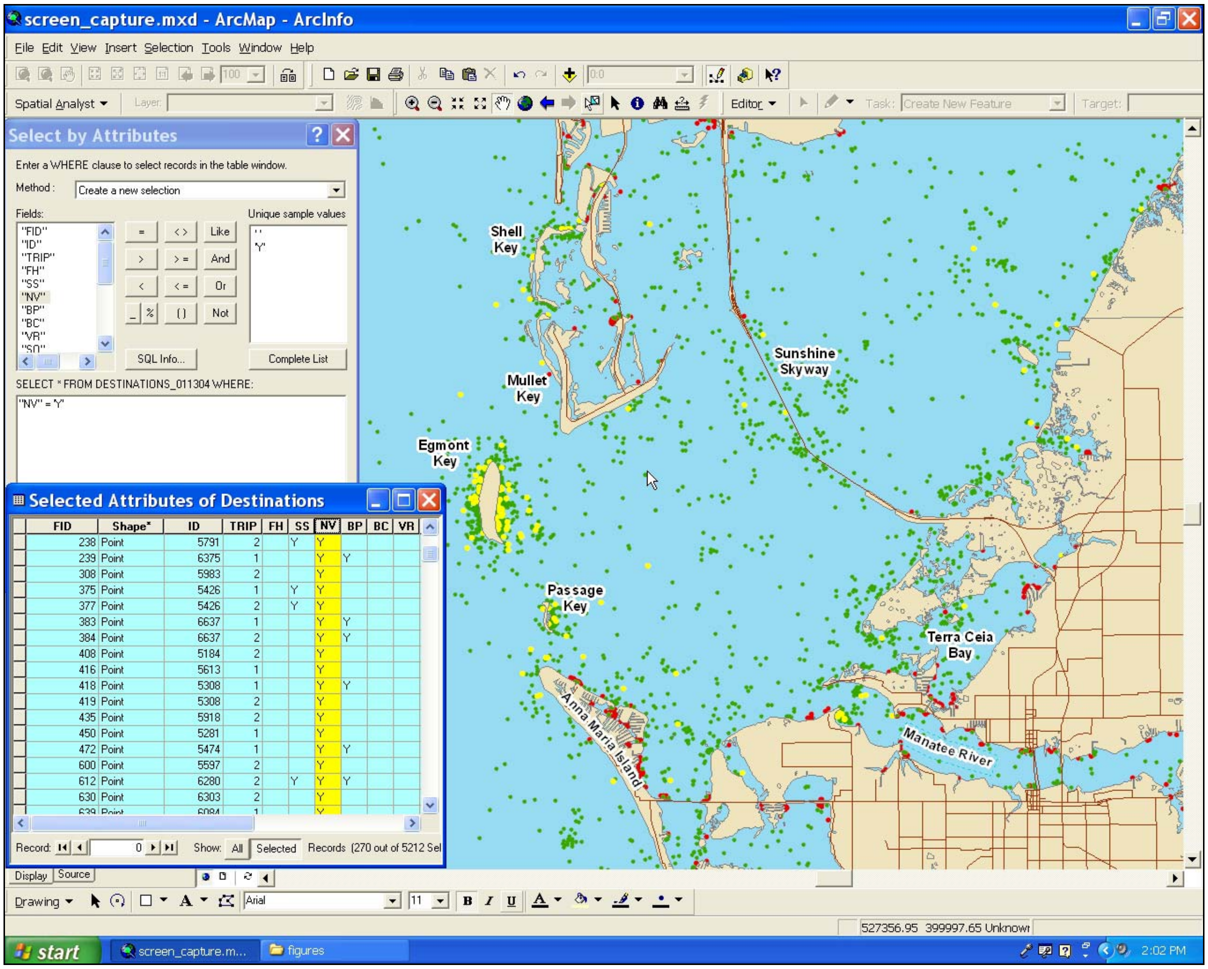

Figure 7. Example of GIS Attribute Query and Display: Nature Viewing Spots.

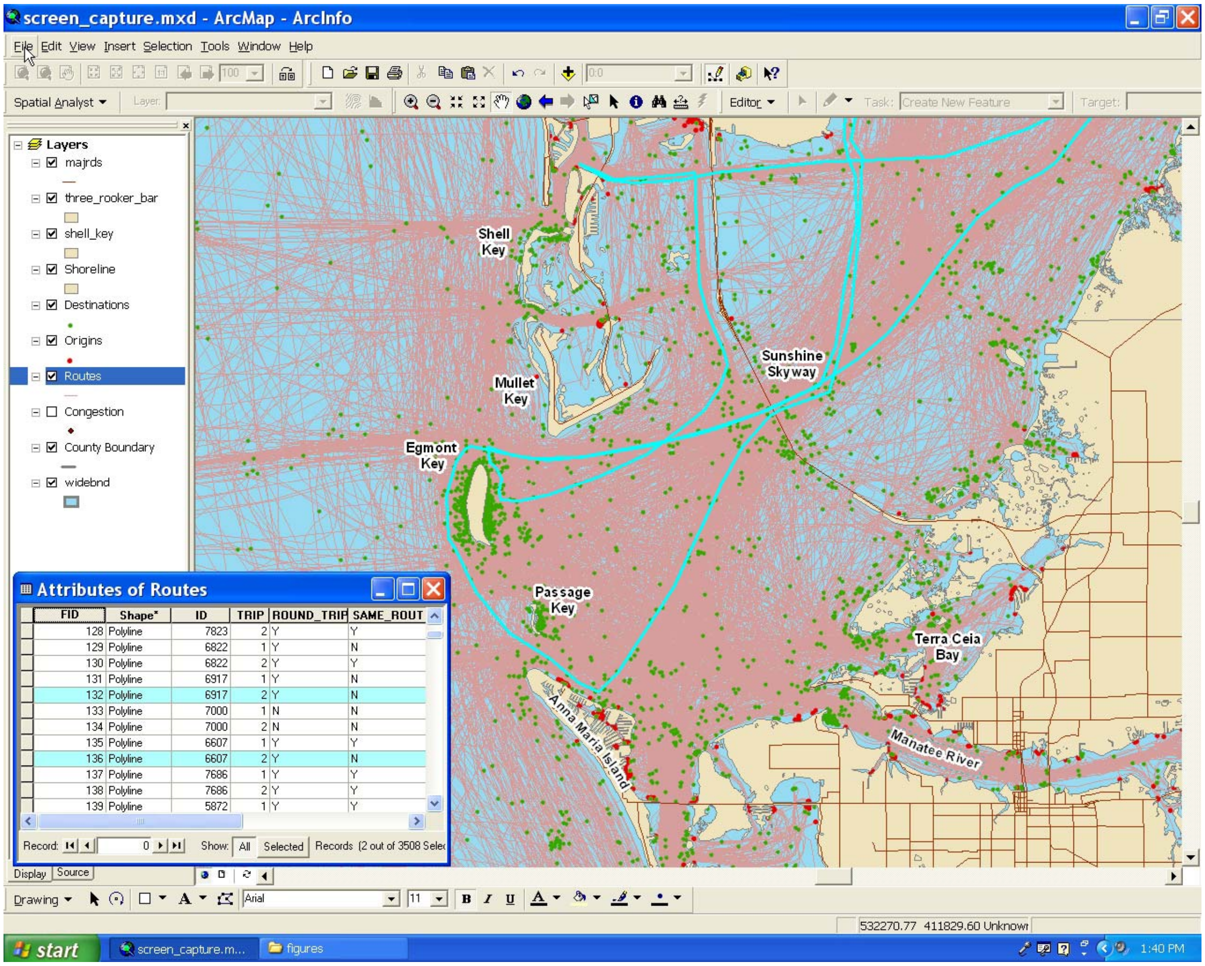

Figure 8. Example of GIS Attribute Query and Display: Reported Travel Routes.

Mapping Boating Patterns

General Clustering Patterns

This chapter presents the results of a GIS analysis that mapped the distribution or spread of the digitized trip information as 'density of occurrence.' Continuous density surfaces generated by the GIS illustrate the degree of concentration or clustering of digitized trip information. For example, Figure 9 illustrates the point pattern of favorite destinations digitized from survey information and the density-derived use-intensity surface.

First, general clustering patterns for departure sites, travel routes, destinations, and congested areas are mapped and described using the following mapping resolution parameters: 300 foot grid cells and a search radius of one mile. Second, the versatility of the database structure is highlighted in a series of maps that show spatial use profiles for specific boater-groups, primary activities, vessel types, and vessel draft classes. The selected mapping resolution of 300 feet square is consistent with the scale of the map onto which respondents drew trip information (1:160,000 or 1 inch equals approximately 2.5 miles)[1]. In addition, a land-barrier mask-grid was developed to constrain the GIS density algorithm to water areas. Lastly, a series of higher resolution maps (100 and 200 foot square mapping resolution) incorporate normal color and black & white imagery to illustrate primary travel corridors and specific destination locales for high-use areas that include Big Sarasota Pass, Longboat pass, Fort DeSoto Park, and the St. Joseph Sound / Caladesi State Park areas.

Departure sites (Figure 10) illustrate the places where the largest numbers of respondents typically begin their trip. Areas that experience the highest density of trip departures generally contain a combination of ramps and marinas (e.g., St. Petersburg Pier, Gandy Bridge, Riverview ramp areas). Other locales that reflect high densities of departures include Anna Maria Island, Upper Manatee River (Bradenton area), Cockroach Bay, and south Sarasota Bay near Big Sarasota Pass.

Route densities are depicted in Figure 11. The lower Tampa Bay area (i.e., Ft. DeSoto Park Indian Key, Pinellas Point, the Sunshine Skyway, and Anna Maria Sound), clearly experiences the greatest density of boat traffic. This area represents the primary boating node for the Sarasota and Tampa Bay regions. High traffic density was also documented at the major passes (e.g., Longboat Pass, Blind Pass, Johns Pass, and Clearwater Pass). Beyond the barrier islands, the flow of boat traffic follows a radial pattern to and from prominent artificial reefs in the Gulf of Mexico.

[1] The National Oceanographic and Atmospheric Administration (NOAA) Charting Division has determined that the plotting positional accuracy for most features on nautical charts is 0.5mm at chart scale. This assumes that the average width of a pencil line is 0.5mm. To put this into perspective, at 1:80,000 scale a line 0.5mm wide on the chart equates to 40 meters on the earth. At 1:160,000, the same line width equates to 80 meters on the earth. (see http://chartmaker.ncd.noaa.gov/staff/Accuracy.htm).

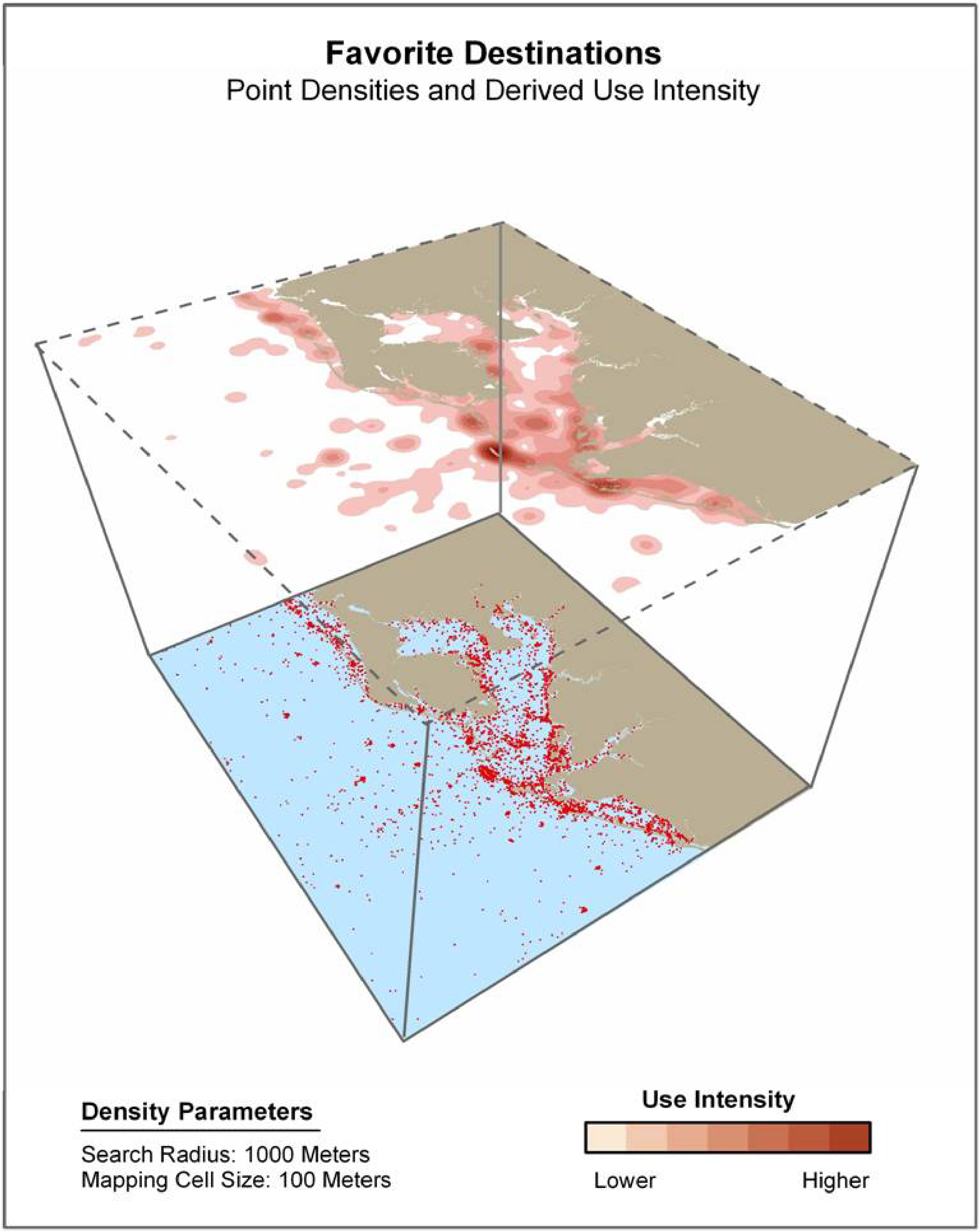

Figure 9. Point Densities and Derived Use Intensity.

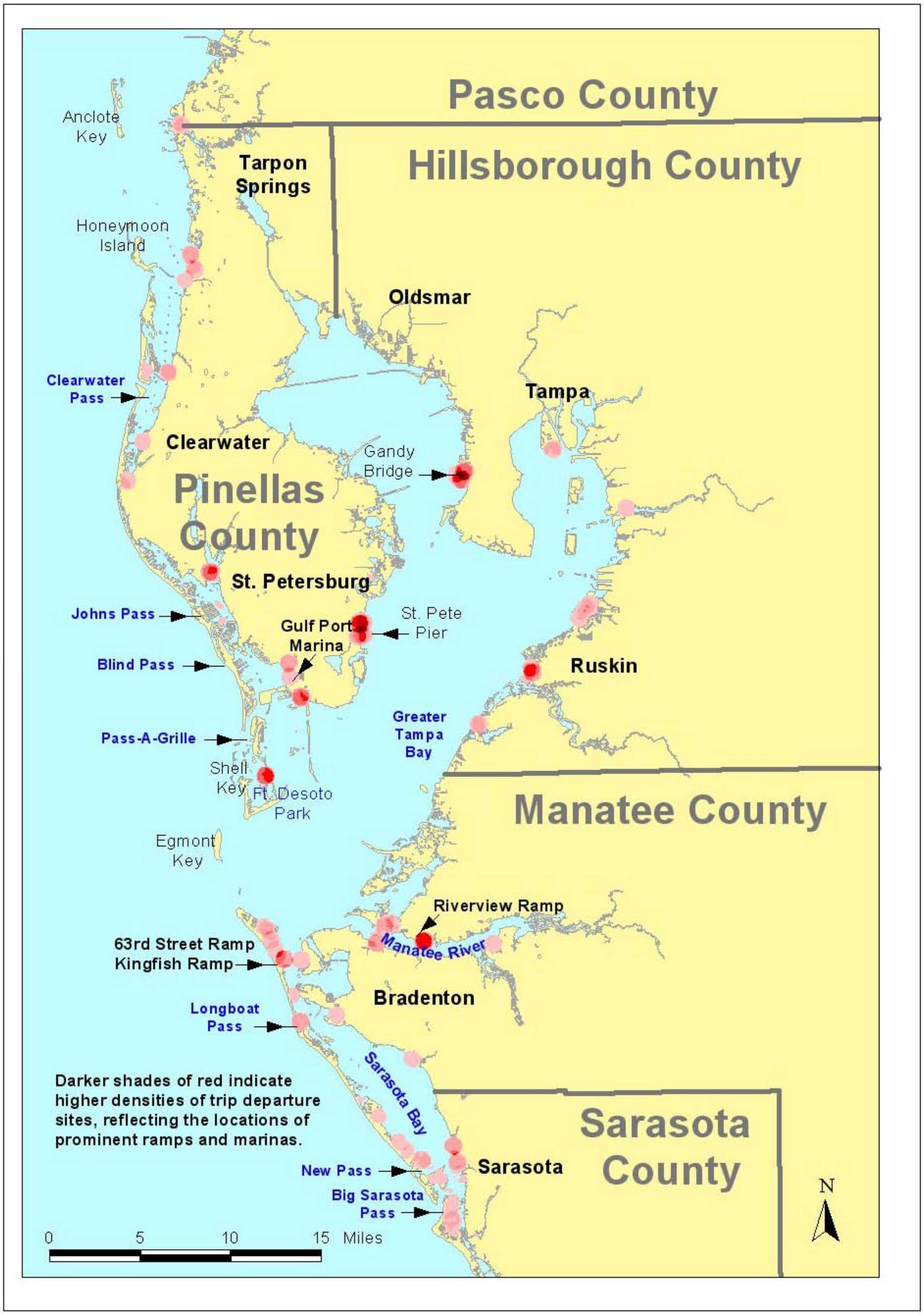

Figure 10. Trip Origin Concentrations as Summarized with the GIS.

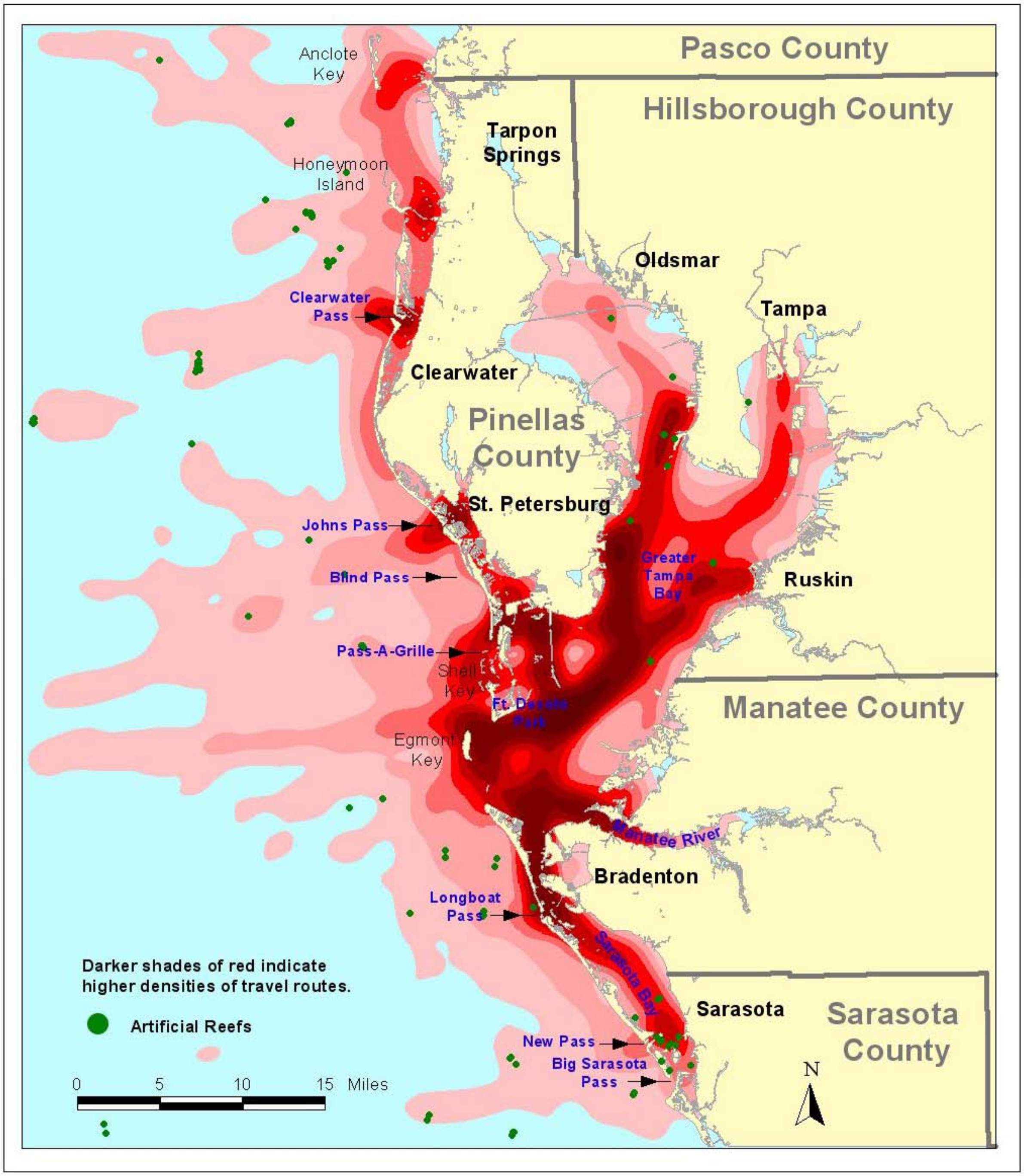

Figure 11. Travel Corridors as Summarized with the GIS.

Figure 12. Favorite Destinations as Summarized with the GIS.

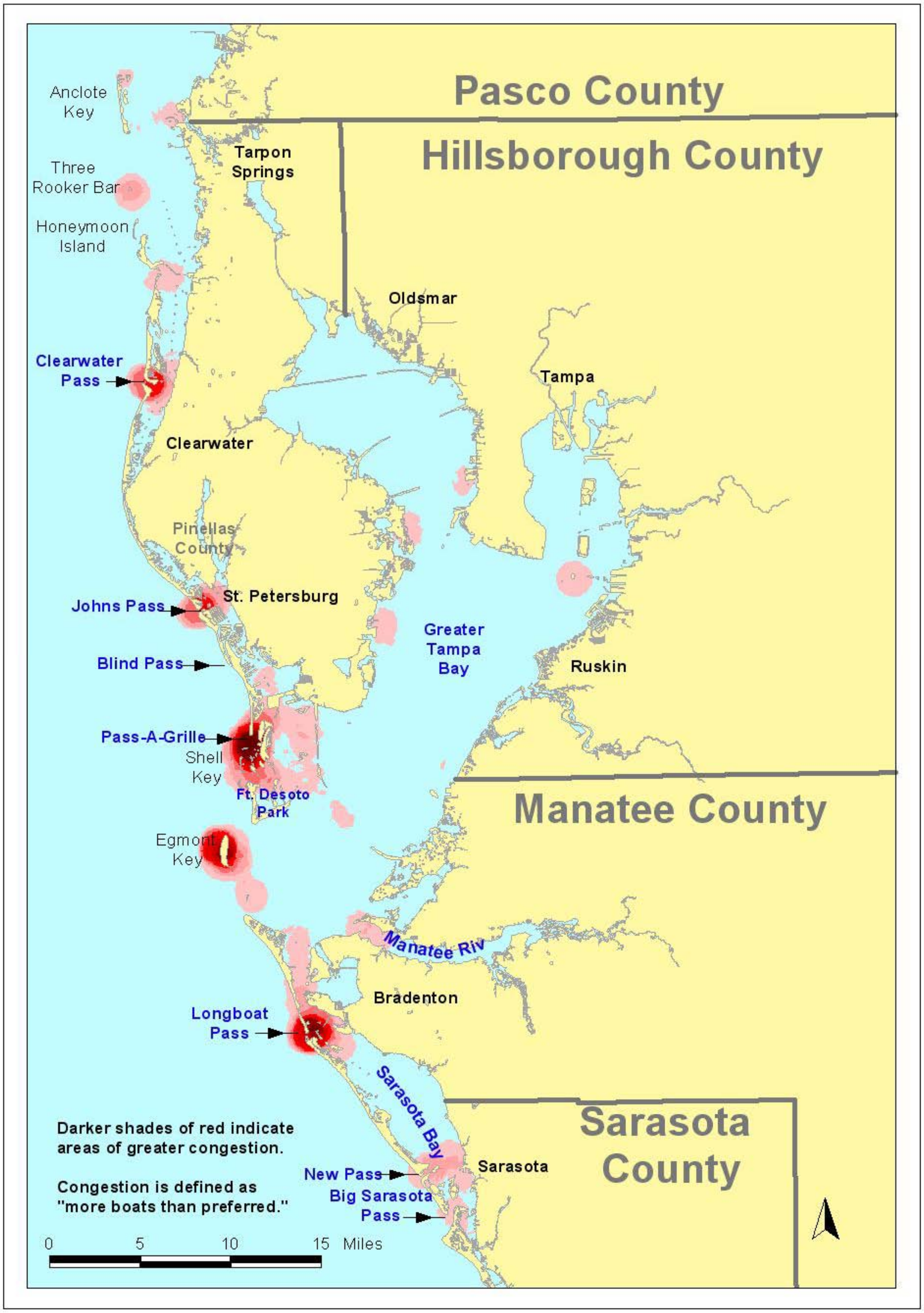

Figure 13. Congested Areas as Summarized with the GIS.

Figure 12 displays favorite destinations identifying the locales where boaters most like to visit on a typical recreational boating outing. The density analysis reveals two prime boating destinations: Egmont Key, and Longbeach / Longboat Pass. Secondary destination areas include the upper Manatee River / Terre Ceia Bay and south Sarasota Bay locales. The Three Rooker Bar / Honeymoon Island, Weedon Island, Shell Key, and Sunshine Skyway areas also represent important boating destinations.

Figure 13 shows areas where boaters experience congestion defined in Question 22 as "more boats than you prefer." The analysis shows the boaters experience congestion at their favorite destinations (e.g., Egmont Key, Longbeach / Longboat Pass) and at certain passes (e.g., Clearwater Pass, John's Pass), through which they must navigate en route to open Gulf waters and / or their boating destinations.

Shell Key was identified as a prime spot for congestion while Egmont Key experienced more overall activity. A possible explanation for this is that Shell Key has significantly less area and shoreline than Egmont Key to accommodate boating. This is due to both natural conditions and management by Pinellas County (e.g., some areas are closed to public access). The beaches north and south of Shell Key are also closed to boating. While Shell Key can accommodate a fewer number of total boats, those boats will be beached gunwale to gunwale leaving no more physical space for additional boats. So, Shell Key might be the top destination after all, but once the limited capacity is met, additional boaters must deal with congested conditions, or go elsewhere - which is usually Egmont Key if weather permits.

Spatial Use Patterns by Boater-Group, Activity, Vessel Type, and Draft

To illustrate the versatility of the database structure spatial use-patterns by (1) boater-group, (2) primary activity type, (3) vessel type, and (4) vessel draft category are presented. Travel corridors are delineated and mapped according to route clustering that exceeds the mean density for the region by one, two, and three standard deviations. Destination hot-spots identify locales that experience clustering of favorite destination points that exceed the mean density for the region by three standard deviations.

Figure 14 shows primary travel corridors and destination hot spots by boater-group. The analysis reveals that some boater-groups exhibit a greater spatial footprint on bay waters than others. For example, respondents that depart from marina wet-slips tend to follow primary travel channels and cluster at the fewest destinations (e.g., Egmont Key, Longbeach, DeSoto Point on the Manatee River, Caladesi State Park/Honeymoon Island areas, and the St. Petersburg pier). By contrast, users of dry storage facilities have less concentrated travel paths and a relatively greater variety of destinations. Respondents that departed from ramps also exhibit more disperse travel patterns but tended to cluster along near-shore areas in and around Cockroach Bay, Bishop Harbor, Terra Ceia Bay, and Perico Island. Private dock users tended to cluster in the south Sarasota Bay area which is consistent with the presence of residential canal systems in that area.

Activity hot-spots are mapped in Figure 15. Egmont Key is shown to be a very popular destination for each of the recorded activities. Respondents that liked to picnic and camp on beaches did so at similar destinations (e.g., Shell Key, Pine Island, Egmont Key, and the Longbeach locale). Fishing activities tended to cluster along the southeastern Tampa Bay shoreline, and the Egmont Key, and Sunshine Skyway areas. Respondents that liked to fish and scuba dive identified similar off-shore destinations (e.g., prominent artificial reefs). Nature viewing and sightseeing activities clustered predominantly at the Egmont Key, Caladesi St. Park, Shell Key, and Longbeach / Longboat pass locales. The activities of sailing and cruising were less localized, taking place throughout the region.

Spatial patterns by vessel type category are presented in Figure 16. Respondents that owned sailboats were associated with the fewest destinations (e.g., DeSoto Point on the Manatee River, Longbeach, Egmont Key, Passage Key, and the St. Petersburg Pier locales). Owners of small speedboats and power cabin cruisers were also found to cluster at a few specific destination locales that include Three-Rooker Bar, Pine Island, the St. Petersburg Pier, Shell Key, Egmont Key, and prominent Sarasota Bay passes (e.g., Longboat Pass, New Pass, and Big Sarasota Pass). It was no surprise that respondents who operated open-fishing boats exhibited a similar spatial profile as did those whose primary activity was fishing.

Spatial differences were most obvious when trip data were disaggregated and mapped according to vessel draft category (Figure 17). Three vessel draft categories were identified by adding or subtracting one standard deviation from the mean or average draft of vessels owned / operated by respondents. The average vessel draft was determined to be 2.2 feet with a standard deviation of 1.3 feet. Respondents that owned / operated larger draft vessels were more constrained to marked navigation channels and clustered at a few specific destination locales. Respondents that owned / operated vessels within the average draft range exhibited a more diffuse pattern of boating use. Respondents that owned / operated shallow draft vessels tended to cluster at near-shore areas that include Egmont Key, Weedon Island, the southeastern Tampa Bay shoreline from Cockroach Bay south to Perico Bay, and the Longbeach / Longboat Pass locale.

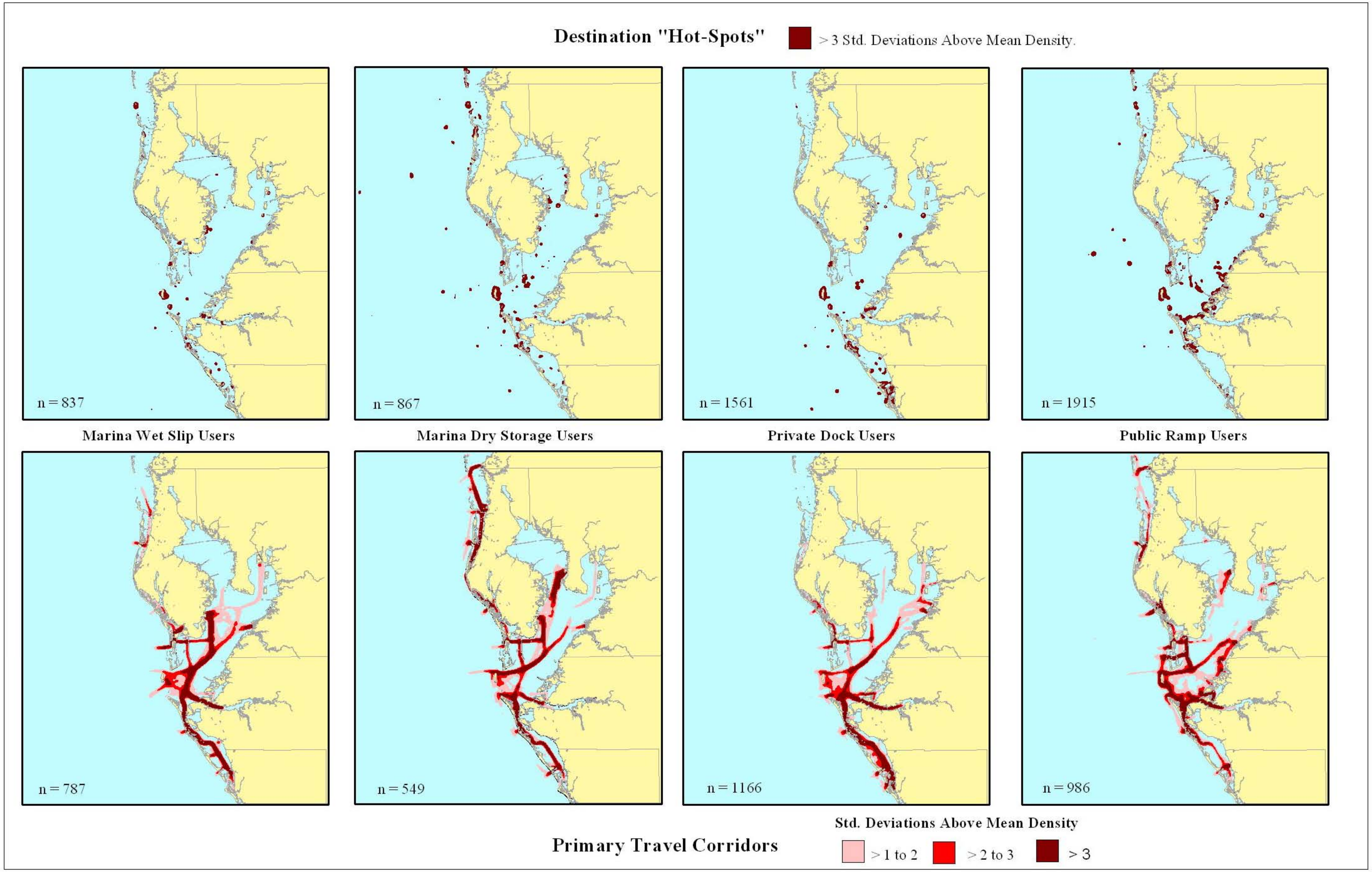

Figure 14. Spatial Use Patterns by Boater Group.

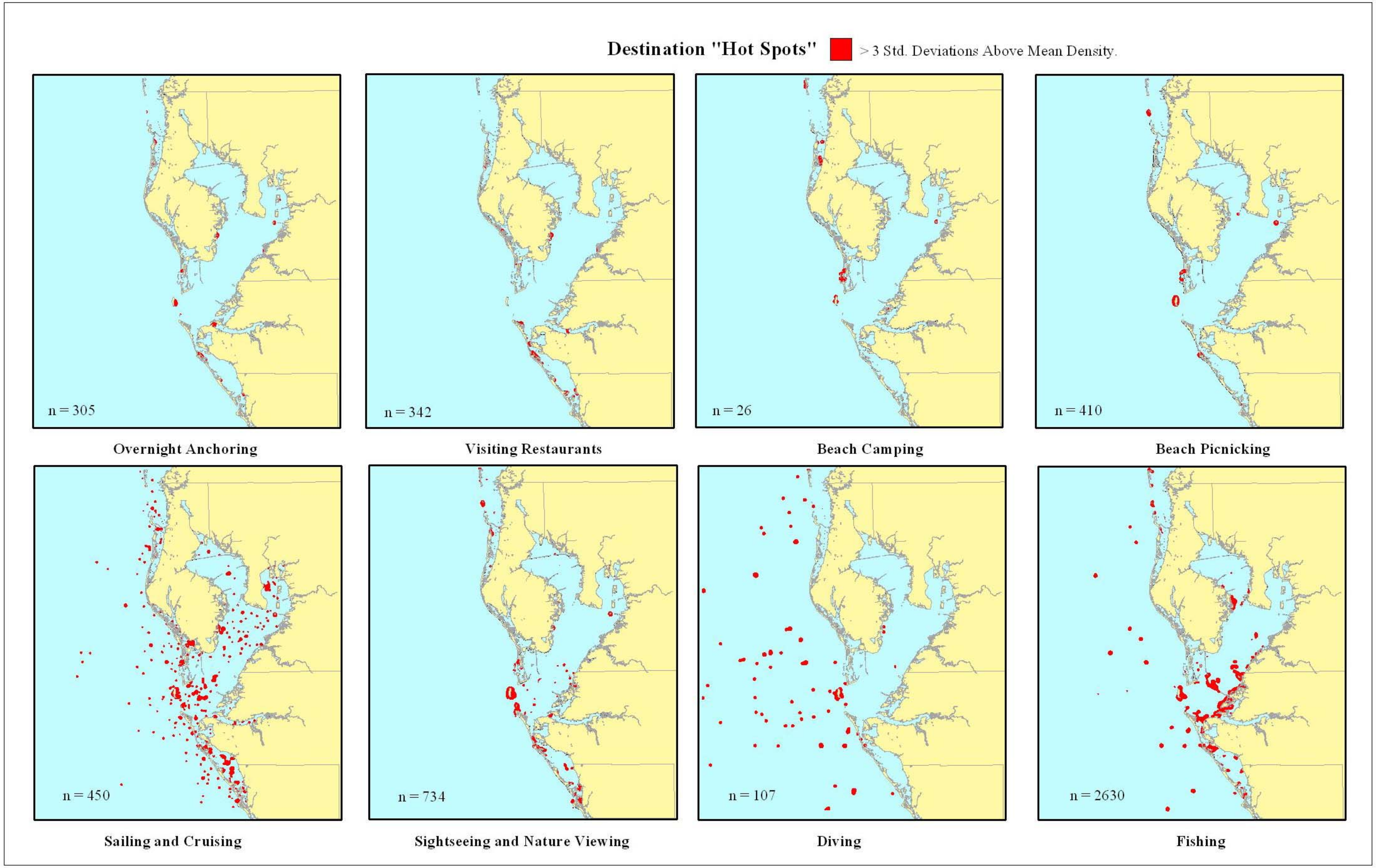

Figure 15. Spatial Use Patterns by Activity.

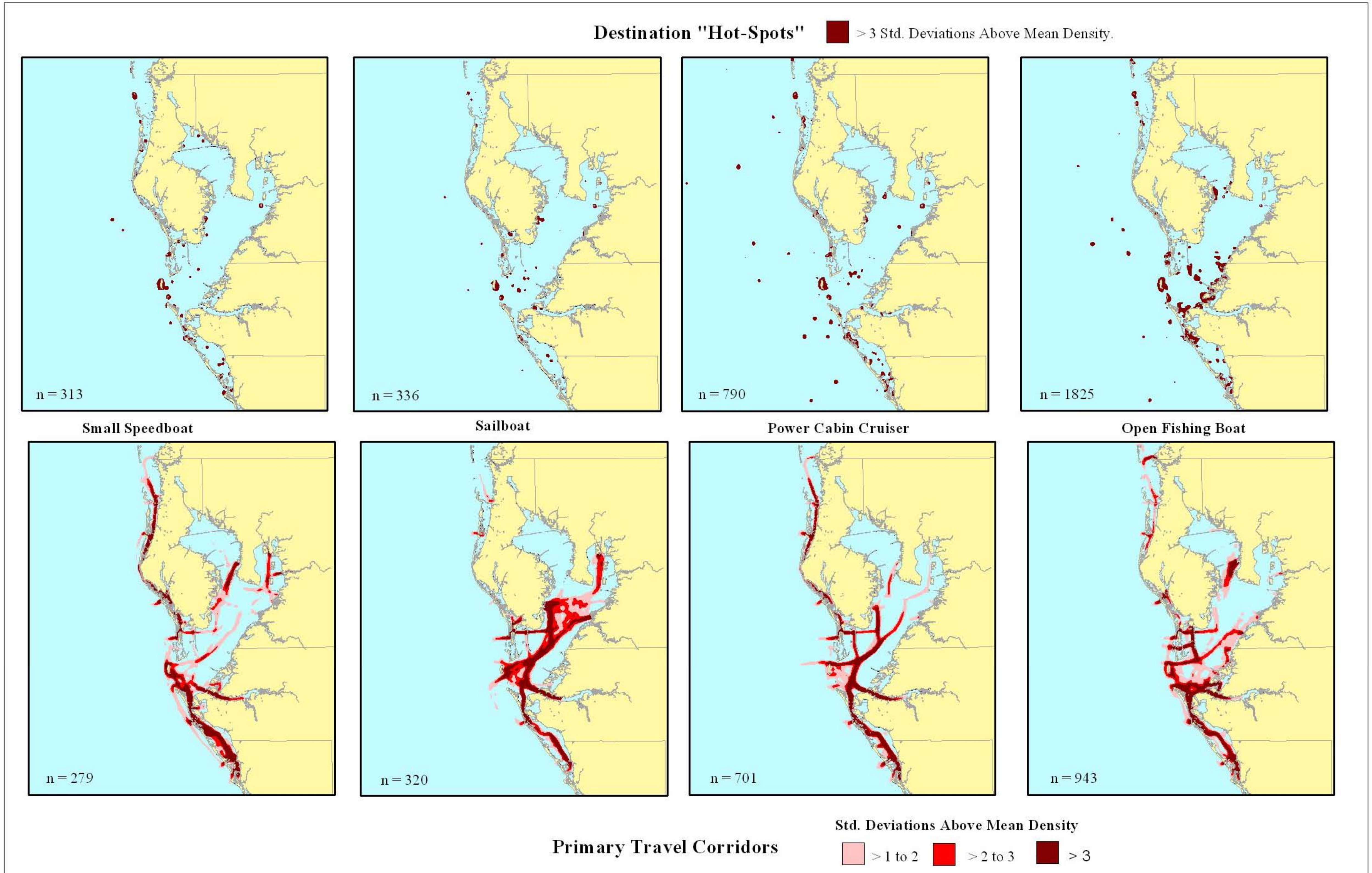

Figure 16. Spatial Use Patterns by Vessel Type.

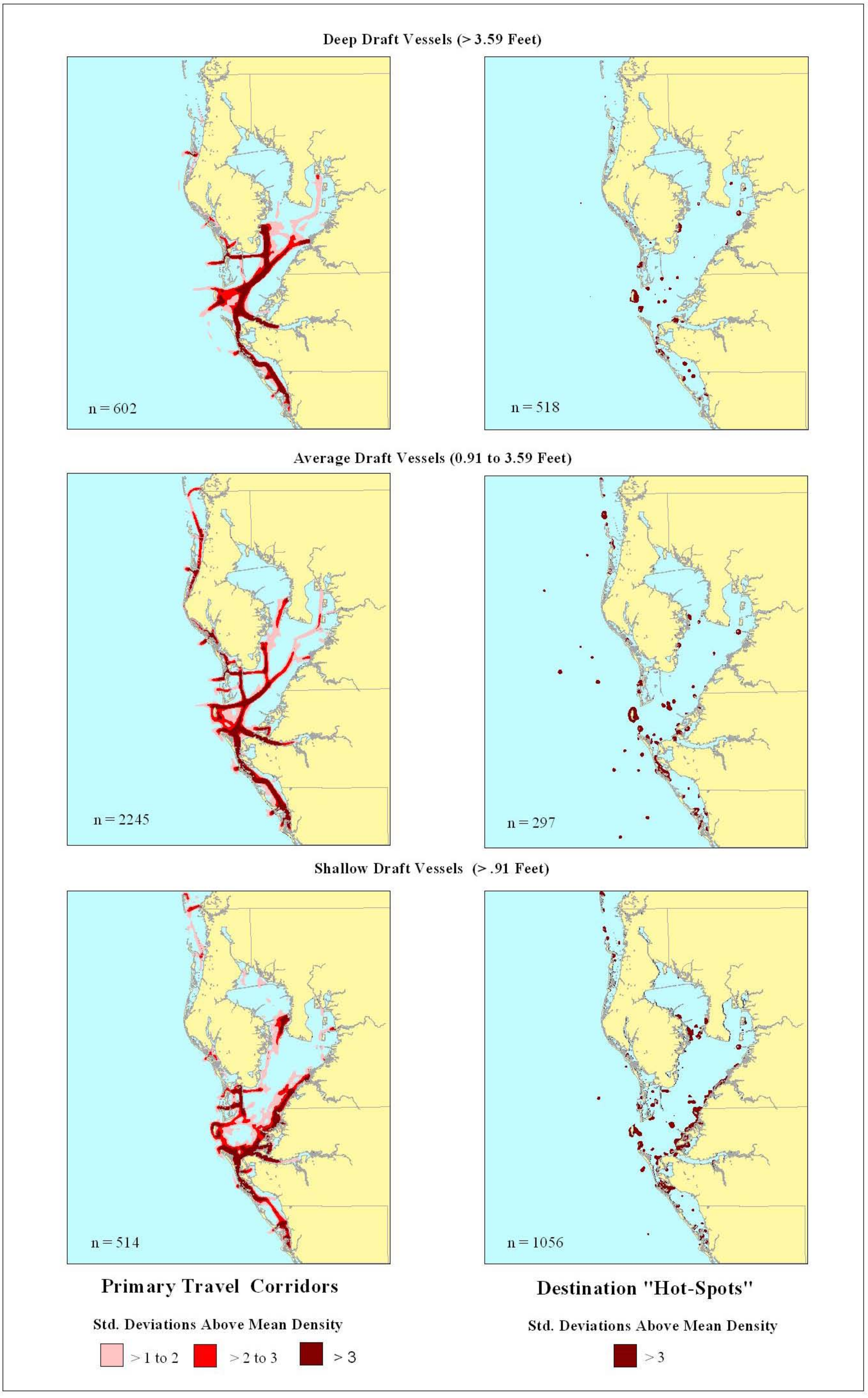

Figure 17. Spatial Use Patterns by Draft Category.

Large-Scale Mapping of Selected High-Use Locales

This section presents higher-resolution maps that identify use-patterns for a selection of high-use boating locales that include Big Sarasota Pass, Longboat Pass, Anna Maria Sound, Fort DeSoto Park, and St. Joseph Sound. For some examples, the higher mapping resolution exceeds map accuracy guidelines, but was used experimentally to smooth the data. Nonetheless, the close-up views show that the density-based travel corridors and destination clustering overlay quite satisfactorily with land and channel features on the imagery[2]. These results may be due, in part, to enhanced accuracy gained by the on-screen digitizing of trip information using a 1:24,000 scale shoreline and navigation markers for orientation.

Figures 18 and 19 illustrate raw and derived information for the south Sarasota Bay region that includes New Pass and Big Sarasota Pass. The point distribution of departure sites, favorite destinations, and congested spots reported by survey respondents are illustrated in Figure 19. Figure 20 displays primary travel corridors and destination hot-spots derived from a density analysis of line (i.e., travel routes) and point (i.e., favorite destinations) features. A 100 foot search radius was selected to emphasize spatial subtleties within the travel routes data theme.

The popular boating locale of Longbeach / Longboat Pass is highlighted in Figure 20. Note that the density analysis, with a 100 foot search radius, accurately identified the locations of the Longbeach anchorage and Beer Can Island as the destination hot-spots within this popular boating locale. A smaller-scale map that illustrates boating patterns for the Anna Maria Sound region is presented in Figure 21. In this example a larger 200 foot search radius was selected to highlight primary travel corridors.

Recreational boating patterns for the popular Fort DeSoto Park area, in Pinellas County, are mapped with a 300 foot search radius and 30 foot mapping resolution and displayed in Figure 22. Lastly, travel corridors and destination hot-spots are identified for Saint Joseph Sound that includes the popular boating destinations of Anclote Key, Three Rooker Bar, and Caladesi State Park / Honeymoon Island (Figure 23). For the Saint Joseph Sound example, density parameters of a 300 foot search radius and 30 foot mapping resolution were selected to highlight primary travel patterns at the selected mapping scale of 1:63,360.

[2] One-foot imagery was obtained from Manatee and Sarasota Counties for the Big Sarasota Pass and Longboat Pass areas. One-meter USGS digital orthophoto quarter quadrangles (DOQQ) were used for the Ft. DeSoto Park, and St. Joseph Sound areas.

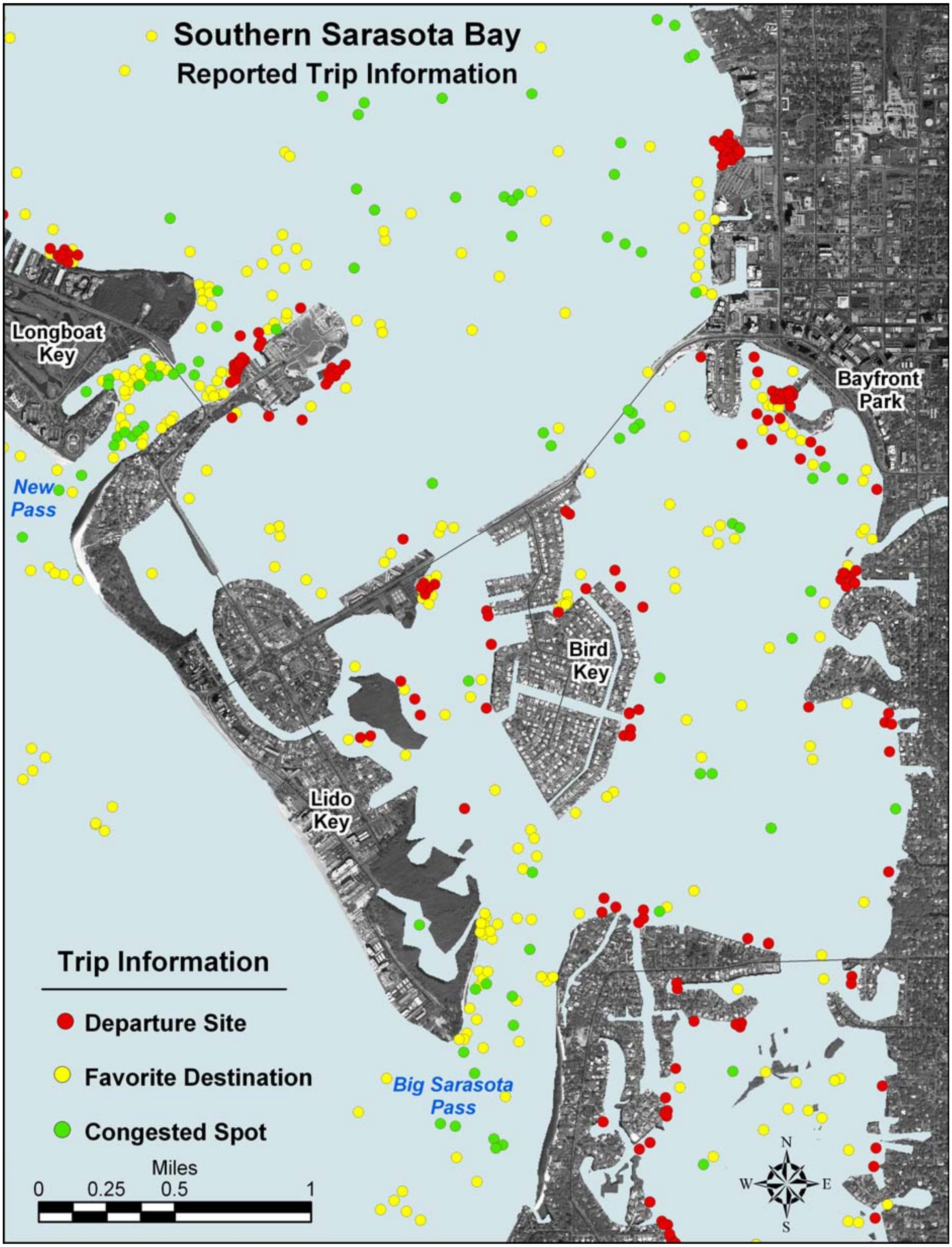

Figure 18. Southern Sarasota Bay: Reported Trip Information.

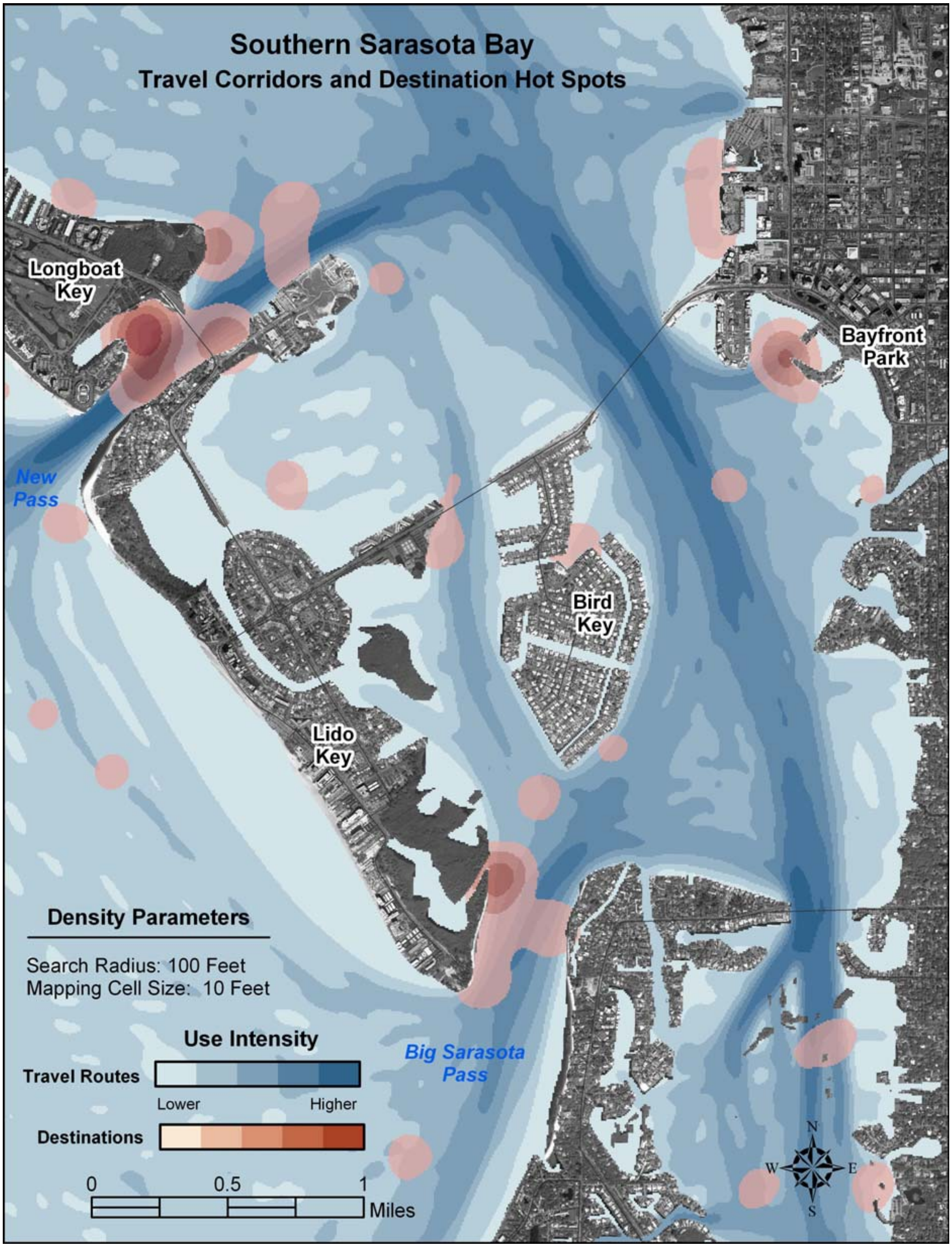

Figure 19. Southern Sarasota Bay: Derived Travel Corridors and Destination Hot Spots.

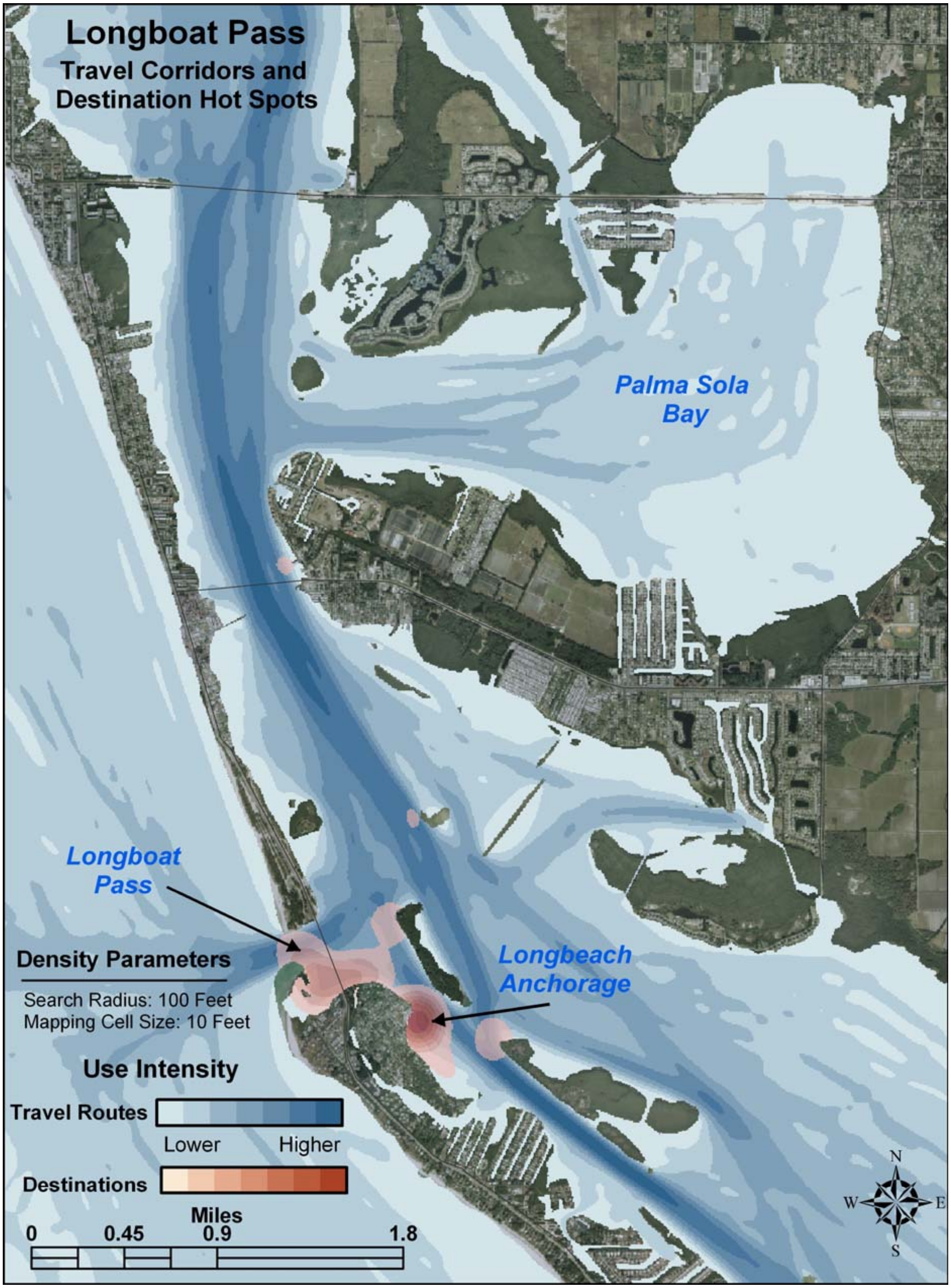

Figure 20. Longboat Pass: Derived Travel Corridors and Destination Hot Spots.

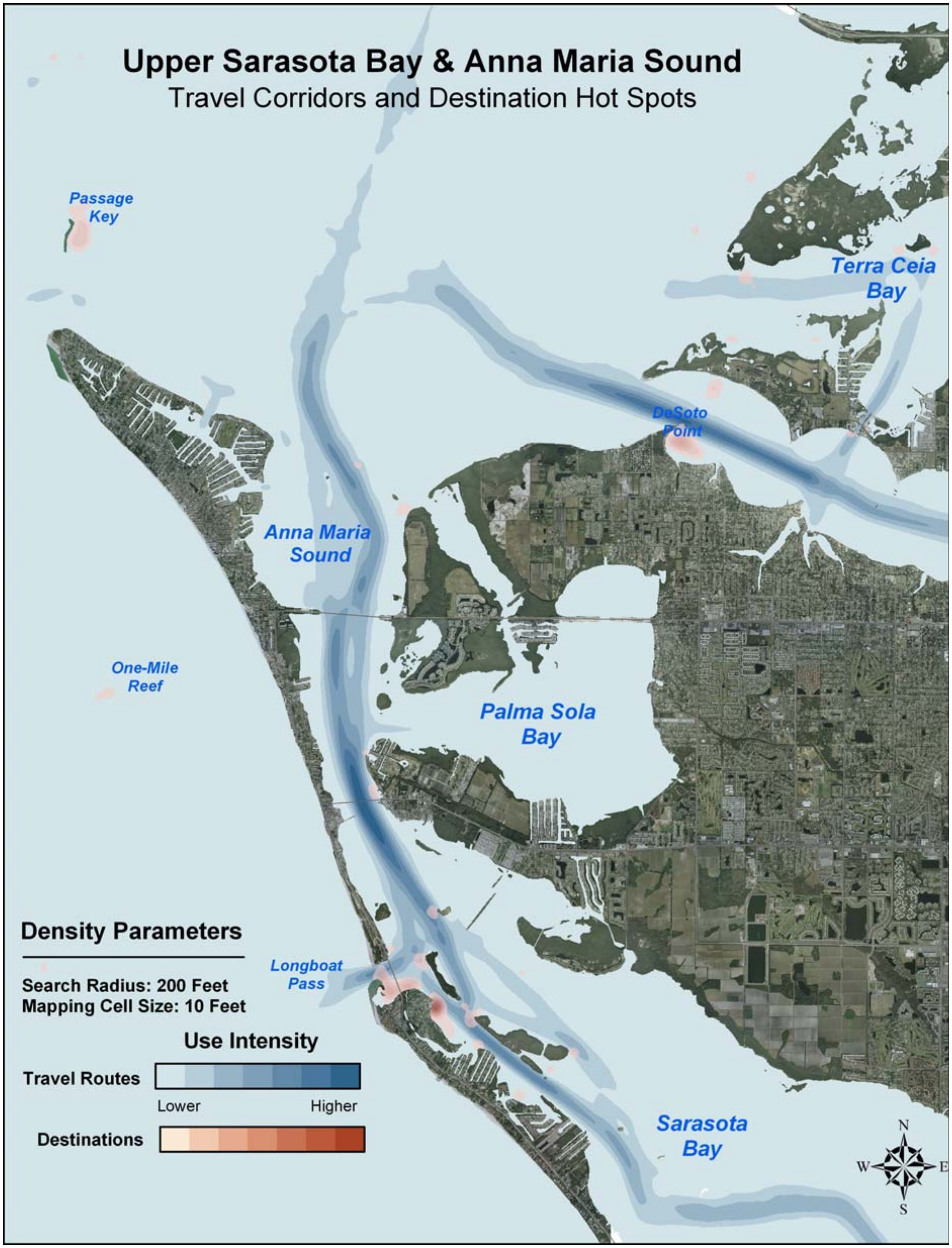

Figure 21. Upper Sarasota Bay and Anna Maria Sound: Derived Travel Corridors and Destination Hot Spots.

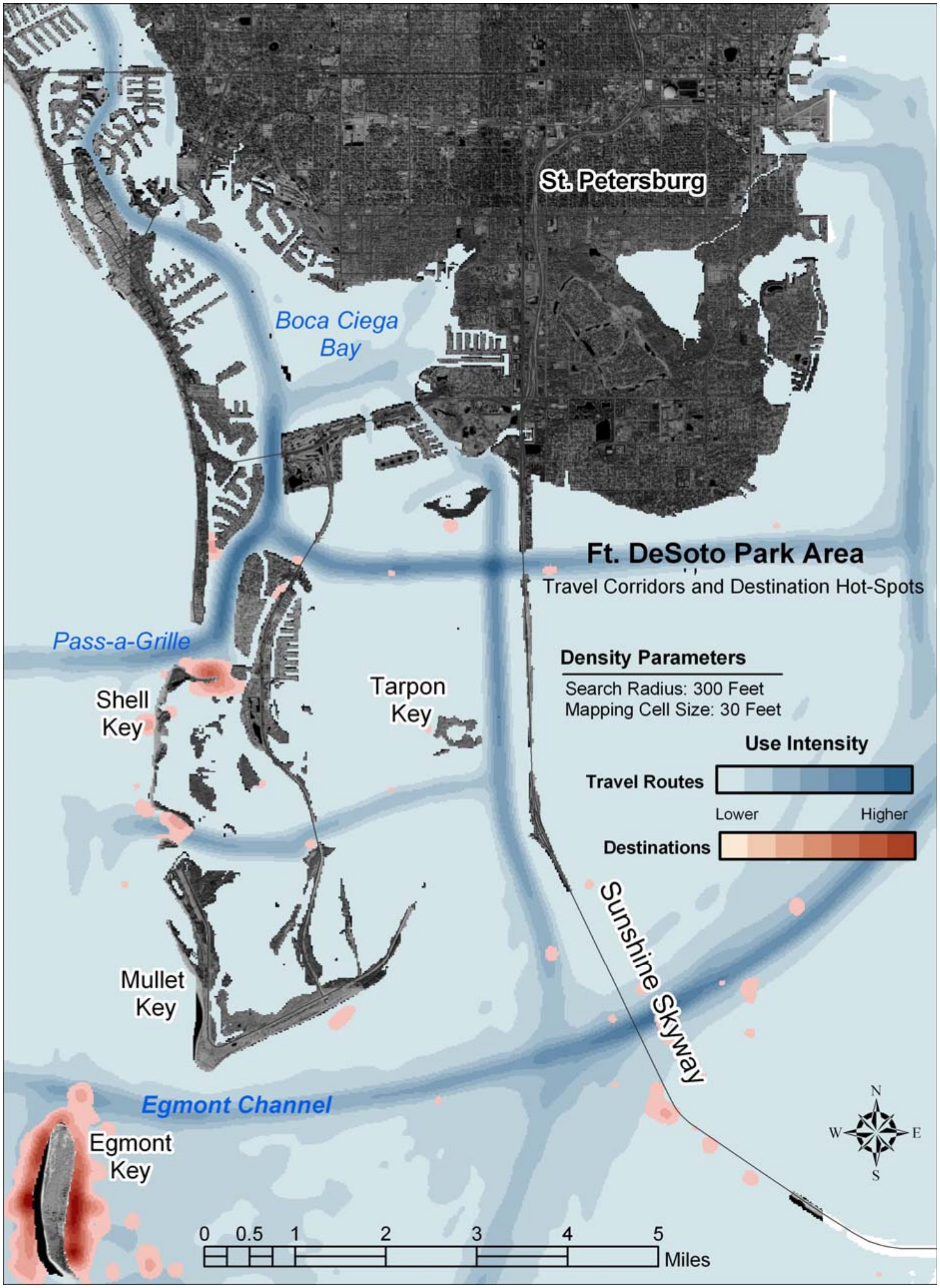

Figure 22. Fort DeSoto Park: Travel Corridors and Destination Hot Spots.

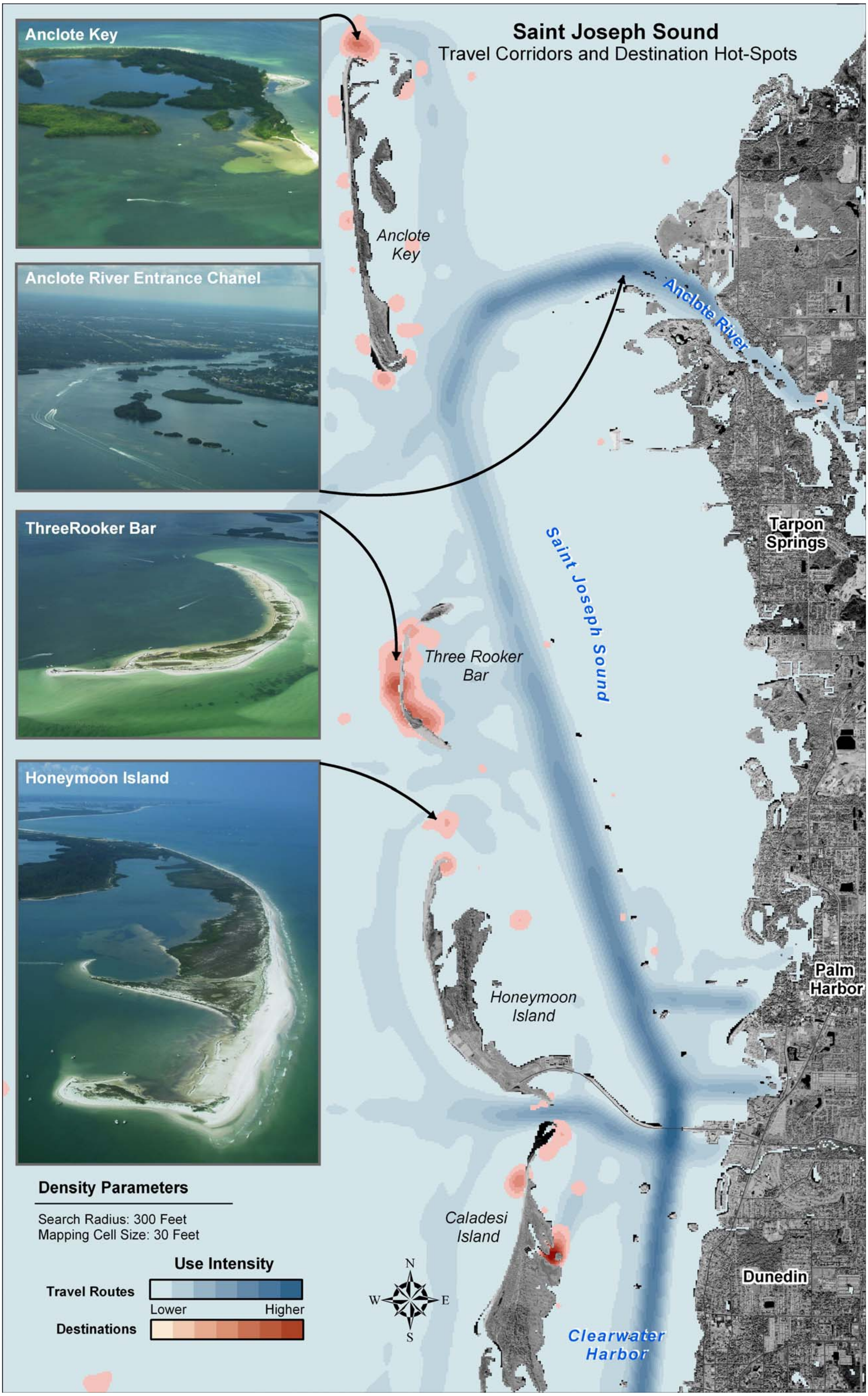

Figure 23. St. Joseph Sound: Travel Corridors and Destination Hot-Spots.

Boater-Group Characteristics

This chapter begins with an overview of the typical survey respondent. This is followed by an evaluation and discussion of responses to specific survey questions. Chapter sections are divided according to themes that describe (1) boats and boaters; (2) trips and seasonality; (3) choice rationale for selecting departure sites, destinations, and travel routes; (4) activities; and (5) perceived congestion. It should be noted that while questions were arranged to follow a logical progression on the survey instrument the following results and discussion sections are arranged thematically and, therefore, questions do not necessarily follow the order that they appeared on the survey. A copy of the survey instrument is provided in Appendix A.

The descriptive analysis presented in this chapter is based on information from N=1,659 returned surveys (as of 8/20/03). The large sample size that closely approximates or exceeds N = 384 for each of the four user-groups sampled ensures that the findings presented in this section are relevant. The sample used for the summary statistics accounts for 87% of all surveys returned (as of 12/31/03; see table 2). Table 3 presents the number of surveys mailed (net), the number of surveys returned and used for the descriptive analysis, and the return rate by user-group and geographic region as of 8/20/03.

Table 3. Survey Return Breakdown (as of 8/20/03).

Location	Category	Surveys mailed	Surveys returned	Return rate
Sarasota Bay	Marina Wet-Slip	561	165	29.4%
Sarasota Bay	Marina Dry-Storage	486	126	25.9%
Sarasota Bay	Ramp	670	117	17.4%
Sarasota Bay	Dock	1,000	257	25.7%
Tampa Bay	Marina-Wet	1,000	291	29.1%
Tampa Bay	Marina Dry-Storage	1,000	247	24.7%
Tampa Bay	Ramp	1,000	254	25.4%
Tampa Bay	Dock	1,000	202	20.2%
		------	------	------
		6,813	1,659	24.7%

Typical Survey Respondent

A compilation of the responses to a subset of questions reveals that the typical respondent to this survey:

- Is a year-round Florida resident and is approximately 54 years of age,
- Has, on average, 18 years of boating experience and has taken a boating safety or seamanship course,
- Owns one boat; either a power boat with cabin accommodations, or an open fishing vessel,

- Prefers marinas or ramps that are close to their home (average of 37 minutes driving time), and boating destinations that are close to or are within easy access of the trip departure site,

- Begins their trip at approximately 8am and spends about 7 hours on the water (wet-slip users with and average of 53 hours per trip spend considerably more time on the water than users of public ramps, dry-storage facilities, and private docks),

- Prefers destinations that offer fishing opportunities, scenic beauty and / or calm protected waters,

- Shows a preference for the following activities in order of importance: fishing, cruising, nature-viewing, sight-seeing, and visiting restaurants,

- Takes three to four boating trips per month, but generally takes more trips during the late spring and summer months (April through August) and fewer trips during winter months (November through February),

- Perceives that the lack of seamanship / boating knowledge by others, and common courtesy particularly among operators of personal watercraft detract most from their recreational boating enjoyment,

- Would like more and better enforcement of boating regulations including ticketing for speeding, wakes, and “bad behavior”,

- Believes that improved education, mandatory licensing, better channel marking, and more ramps with better facilities would do most to improve their recreational boating enjoyment, and lastly,

- Cited the need for better information on weather (i.e., tide, wind, lightning), and “accurate” up-to-date charts that illustrated in greater detail shallow water hazards, shoaling areas, and waterway markers.

Boater Profile

This section summarizes a selection of questions that pertain to the survey respondent (e.g., vessels owned, Florida residence status, type of departure site used – marina, ramp, dock, travel time to departure sites, boating experience/knowledge, age, and internet access).

- Of the 2,329 vessels owned by the N=1,659 survey respondents, 47.3% fall into either of two categories: Power boat with cabin accommodations (24.2%) or open fishing boat (23.1%) – (Table 4; Question 1).

Table 4. Breakdown of Vessel Type Ownership.

Vessel type	Frequency count	Percentage of total
Jet ski	73	3.13%
Kayak/Row/Canoe	189	8.11%
John/Utility	95	4.08%
Sailboat (day sail)	126	5.41%
Sailboat (cruising sail)	241	10.34%
Speed or Jet Boat	148	6.35%
Pontoon or Deck Boat	84	3.60%
Open Fishing	537	23.06%
Skiff or Flats Boat	232	9.96%
Power Boat (w/cabin)	564	24.22%
Other	40	1.72%
	N = 2,329	

- Approximately 68% of the respondents fell into the category of single-boat owners while roughly 32% were multiple-boat owners (Table 5; Question 1).

Table 5. Single Vs. Multiple Boat Ownership.

Category	Count	Percentage
Single boat owner	1,127	68.1%
Multiple boat owner	529	31.9%
	N = 1,656	

- The average number of months per year that respondents reside in Florida is approximately 11.4 (Table 6; Question 23).

Table 6. Average Monthly Residence (per Year) in the State of Florida (Entire Study Region)

N = 1,652 (respondents)
Average number of months living in Florida = 11.38 months

- Respondents had, on average, 18 years of boating experience (Table 7; Question 24).

Table 7. Years of Boating Experience (Entire Study Region).

Statistic	Years boating
Average	18.28
Std. Deviation	14.24
Minimum	0.25
Maximum	74
Median	15
Mode	30

Note: The 95% confidence interval for years boating experience: {0 years < x < 46.2 years}.

- Respondents that began their trips from ramps and docks tended to have the greatest amount of boating experience, as measured in years; respondents that launched from ramps in Sarasota Bay were the leading group with an average of roughly 25 years of experience; respondents that used marina dry-storage facilities tended to have the least amount of boating experience (Table 8; Question 24).

Table 8. Years of Boating Experience (by Location and Departure Category).

			(in years)				
Departure Category		**N**	**Average**	**Std. Dev.**	**Median**	**Min**	**Max**
SB	Marina Wet-Slip	165	15.4	13.1	10	1	50
SB	Marina Dry-Storage	126	12.3	12.2	7.5	0.5	58
SB	Ramp	116	24.8*	15.2	25	2	65
SB	Dock	257	19.3*	14.7	15	2	68
TB	Marina Wet-Slip	291	17.8	14.1	15	1	65
TB	Marina Dry-Storage	246	14.9	13.3	10	0.25	63
TB	Ramp	253	20.7*	13.8	20	1.5	67
TB	Dock	201	21.0*	14.5	20	1	74
Overall		N = 1,655					

Key: SB = Sarasota Bay; TB = Tampa Bay
*denotes above-average boating experience (> 18.28)

- Roughly 71% of the N=1,654 respondents indicated that they have had a boater safety or seamanship course: Boaters that launched from ramps tended to be the least likely group to have had a boater safety or seamanship course (Table 9; Question 25).

Table 9. Boaters Having Completed a Boat Safety/Seamanship Course (by Location and Departure Category).

Departure Category		N	Count	Percentage	Above avg
SB	Marina Wet-Slip	165	138	83.6%	yes
SB	Marina Dry-Storage	126	90	71.4%	yes
SB	Ramp	117	60	51.3%	no
SB	Dock	257	190	73.9%	yes
TB	Marina Wet-Slip	290	242	83.4%	yes
TB	Marina Dry-Storage	246	170	69.1%	no
TB	Ramp	253	130	51.4%	no
TB	Dock	200	150	75.0%	yes
Overall		N = 1,654	1,170	70.7%	

Key: SB = Sarasota Bay; TB = Tampa Bays.

- Survey respondents were, on average, 54 years of age (Table 10; Question 26).

- Respondents that departed from docks and marina wet-slips in the Sarasota Bay region were slightly older than the average respondent, at 58 years of age (Table 10; Question 26).

- Ramp users in general and marina dry-storage users in Tampa Bay tended to be markedly younger than respondents associated with other location / departure categories (Table 10; Question 26).

Table 10. Age of Boaters (by Location and Departure Category).

		(in years)					
Departure Category		**N**	**Average**	**Std. Dev.**	**Median**	**Min**	**Max**
SB	Marina Wet-Slip	163	59.8*	9.5	60	31	86
SB	Marina Dry-Storage	126	56.4*	10.9	57	25	78
SB	Ramp	117	48.6	10.7	48	24	79
SB	Dock	255	60.5*	11.8	61	15	83
TB	Marina Wet-Slip	290	55.0*	10.9	55	20	82
TB	Marina Dry-Storage	246	50.7	11.8	51	18	83
TB	Ramp	253	48.3	11.4	48	18	65
TB	Dock	202	55.1*	10.9	55	17	82
Overall		N = 1,652	54.3	11.9	54	15	86

Key: SB = Sarasota Bay; TB = Tampa Bay; N = number of respondents.
* denotes above-average values

- Overall, access to the Internet was extremely high among respondents of all user-groups in the Tampa and Sarasota Bay study region. Internet access was greatest among boaters that used marina wet slips and dry storage facilities, followed by respondents that departed from docks in Tampa Bay. Respondents that launched from ramps had the lowest percentage of Internet access. Nevertheless, 85% of ramp users indicated that they had Internet access. (Table 11; Question 27).

Table 11. Boater Access to Internet (by Departure Category).

Departure Category		N	Count	Percentage	At or above avg.?
SB	Marina Wet Slip	165	154	93.3%	yes
SB	Marina Dry Storage	124	113	91.1%	yes
SB	Ramp	116	99	85.3%	no
SB	Dock	257	228	88.7%	no
TB	Marina Wet Slip	290	268	92.4%	yes
TB	Marina Dry Storage	247	230	93.1%	yes
TB	Ramp	254	225	88.6%	no
TB	Dock	202	190	94.1%	yes
Overall		N = 1,655	1,507	91.1%	

Key: SB = Sarasota Bay; TB = Tampa Bay.

- To the average respondent, boating is very important to the quality of life in Florida (Table 12; Question 29).

- Boating was of relatively greater importance, as part of defining the quality of life in Florida, for respondents that departed from marina wet-slips and ramps; boating was slightly less important to respondents that departed from docks and dry-storage facilities (Table 12; Question 29).

Table 12. Importance of Boating to the "Quality of Life" in Florida (by Departure Category).

Departure Category		N	Average	Std. Dev.
SB	Marina Wet-Slip	165	4.51*	0.73
SB	Marina Dry-Storage	125	4.20	0.86
SB	Ramp	117	4.64*	0.58
SB	Dock	257	4.28	0.80
TB	Marina Wet-Slip	291	4.48*	0.71
TB	Marina Dry-Storage	247	4.38	0.76
TB	Ramp	254	4.57*	0.68
TB	Dock	201	4.38	0.92
Overall		N = 1,657	4.42	0.77

Key: SB = Sarasota Bay; TB = Tampa Bay;* indicates an above-average value

Trip Profile and Seasonality

This section highlights aspects of the typical boating excursion by summarizing travel times to departure sites, identifying typical departure sites, and characterizing the timing, duration, and frequency of trips.

- Respondents logged about a 26-minute journey to the departure or launch site (Table 13a; Question 15).

Table 13a. Travel time to Departure Site (Entire Study Region).

	(in minutes)*			
N	**Average travel time**	**standard deviation**	**Minimum**	**Maximum**
1,477	26	79	0	1,320

*Note: In the case of "docks" (where response is coded as 999 – not applicable), travel time is set to zero as it is assumed that the boat is docked at the residence. Travel time data is rounded to the nearest minute.

- Excluding dock users, the average travel time to the launch or departure site for Sarasota Bay respondents was roughly 40 minutes, as compared with a travel time of 33 minutes for Tampa Bay respondents (Table 13b; Question 15).

Table 13b. Travel Time to Departure Site by Region (Sarasota Bay vs. Tampa Bay).

	Sarasota Bay	**Tampa Bay**
N	592 (351)	885 (728)
	in minutes	
Average travel time	24 (40)	27 (33)
Standard deviation	90 (114)	70 (75)
Median	5 (15)	15 (20)

*values in parentheses are results excluding dock user data.

- Travel time to the departure site was greatest for respondents that initiated trips from marinas: Travel time to wet-slips in Sarasota Bay was roughly 15 minutes greater than travel time to wet-slips in the Tampa Bay area (Table 13c; Question 15).

- Users of marina wet-slips logged the greatest travel times to departure sites at 52 minutes on average. Ramp users, on average, logged about 33 minutes of travel time to a launch site. Note also that travel time to marina dry-storage was higher for Sarasota Bay users than it was for Tampa Bay users, by a little over eight minutes (Table 13c; Question 15).

Table 13c. Travel Time to Departure Site (by Location and Departure Category).

Location/Departure Category		N	Average travel time (in minutes)	standard deviation (in minutes)	Median (in minutes)	Maximum (in minutes)
SB	Marina Wet Slip	121	59	148	15	960
SB	Marina Dry Storage	101	31	130	15	1,320
SB	Ramp	115	33	34	20	210
SB	Dock	225	1	5	0	60
TB	Marina Wet Slip	232	45	129	20	1,320
TB	Marina Dry Storage	211	23	19	15	120
TB	Ramp	247	33	27	25	150
TB	Dock	195	4	11	0	75
Overall		N = 1,477				

Key: SB = Sarasota Bay; TB = Tampa Bay.
*Note: In the case of "docks" (where response is coded as 999 – not applicable), travel time is set to zero as it is assumed that the boat is docked at the residence. Travel time data is rounded to the nearest minute.

- Tables 14a and b identify and compare the location where the vessel was surveyed with the location/departure categories specified in returned surveys. Category congruence was the highest for ramp users, with an accuracy of 95%. The average congruence rate for all groups was just over 82%. Discrepancies may be due to confusion over terminology (i.e., storage versus launch scenarios, ramp versus dock, ramp versus shoreline, etc.) and for errors associated with the identification of shoreline or other departure sites as 'typical' (Tables 14a and b; Question 13).

Table 14a. 'Typical' Departure Site.

Departure Category	Count*	Percentage
Boat Ramp	455	27.6%
Shoreline	16	1.0%
Marina Wet Slip	391	23.8%
Home Dock	477	29.0%
Condominium Dock	28	1.7%
Marina Dry	273	16.6%
Other	5	0.3%
	N = 1,645	

*Count equals the number of respondents that indicated typical departure site by category.

Table 14b. Congruency Test Results for Actual Vs. 'Typical' Departure Site.

Departure Category	**N**	**# of matches**	**Match rate**
Marina (Wet)	454	356	78.4%
Marina (Dry)	365	246	67.4%
Ramp	370	351	95.0% (highest)
Dock	457	397	86.9%
Overall	N = 1,645	1,350	82.1%

- The average AM start time was highly sensitive to location and departure category, with boaters that departed from docks in Sarasota leaving the earliest. In both cases (e.g., trip 1 and 2) the median start time for respondents in the study region was 8:00AM (Table 15a and 15b; Question 7, parts a and b).

Table 15a. Average Departure-Time by Location/Departure Category (AM only) - ***first trip***.

Location/Departure Category	**N**	**Avg. hour**	**Avg. start time**
SB Marina Wet Slip	134	7.27	7:16AM
SB Marina Dry Storage	112	8.21	8:13AM
SB Ramp	107	7.51	7:31AM
SB Dock	223	6.37	6:22AM
TBMarina Wet Slip	256	7.47	7:28AM
TBMarina Dry Storage	225	7.19	7:11AM
TB Ramp	226	6.82	6:49AM
TB Dock	173	7.38	7:23AM
Overall	N = 1,456	7.19	7:11AM (average) Median = 8:00AM

Table 15b. Average Departure-Time by Location/Departure Category (AM only) -- ***second trip***.

Location/Departure Category		N	Avg. hour	Avg. start time
SB	Marina Wet Slip	126	7.54	7:32AM
SB	Marina Dry Storage	109	7.92	7:55AM
SB	Ramp	107	7.29	7:17AM
SB	Dock	212	5.84	5:50AM
TB	Marina Wet Slip	247	7.28	7:17AM
TB	Marina Dry Storage	216	7.11	7:07AM
TB	Ramp	211	6.63	6:38AM
TB	Dock	169	6.99	6:59AM
Overall		N = 1,397	6.98	6:59AM (average) Median = 8:00AM

Key: SB = Sarasota Bay; TB = Tampa Bay. Average start hours are converted to start times and rounded to the nearest minute. PM start time data was not analyzed due to potential problems in interpreting the responses.

- Respondents that departed from marina wet-slips tended to log substantially longer hours on the water than other groups of boaters. This is not surprising, as this group of boaters was also associated with the largest percentage of boaters classified as 'overnighters' (Table 16a and b; Question 8, parts a and b).

Table 16a. Average Number of Hours on Water by Location / Departure Category ***first trip***, with "Day-tripper" (DT) vs. "Overnighter" (OV) Counts.

Location/Departure Category		N	Avg. hours	Counts DT	Counts OV	Counts %OV
SB	Marina Wet Slip	152	72	112	40	26.3
SB	Marina Dry Storage	122	9.4	115	7	5.7
SB	Ramp	115	7.5	112	3	2.6
SB	Dock	245	6.7	237	8	3.2
TB	Marina Wet Slip	285	40.4	187	98	34.3
TB	Marina Dry Storage	242	10.6	217	25	10.3
TB	Ramp	247	8.8	232	15	6.1
TB	Dock	196	30.2	174	22	11.2
Overall		N = 1,604		1,386	218	(13.6%)

Key: SB = Sarasota Bay; TB = Tampa Bay; N = number of respondents;
DT = day-trippers; OV = overnighters.

- Respondents that departed from docks in Tampa Bay tended to take longer trips in terms of time out on the water than boaters that departed from docks in Sarasota Bay or, in general, from marina dry-storage facilities (Table 16a and b; Question 8, parts a and b).

- Shorter trips were typically associated with Sarasota Bay respondents using ramps and docks, with the highest percentage of ‘day-trippers’ associated with these categories (Table 16a and b; Question 8, parts a and b).

Table 16b. Average Number of Hours on Water by Location / Departure Category ***second trip***, with “Day-tripper” (DT) vs. “Overnighter” (OV) Counts.

			Avg.	Counts		
Location/Departure Category		**N**	**hours**	**DT**	**OV**	**%OV**
SB	Marina Wet Slip	146	65.9	108	38	26.0
SB	Marina Dry Storage	117	18.7	104	13	11.1
SB	Ramp	113	7.2	111	2	1.8
SB	Dock	233	9.1	217	16	6.9
TB	Marina Wet Slip	274	36.3	199	75	27.4
TB	Marina Dry Storage	233	7.8	214	19	8.2
TB	Ramp	232	8.7	219	13	5.6
TB	Dock	188	25.5	169	19	10.1
		Total = 1,536		1,341	195	(12.7%)

Key: SB = Sarasota Bay; TB = Tampa Bay; N = number of respondents;
DT = day-trippers; OV = overnighters.

- Responses suggest a year-round boating season in the study region, with a peak-use period running roughly from April through July and an off-peak period running from November through February. March is somewhat of an average-use month (Tables 17a and b; Question 10).

- Ramp users in Sarasota Bay and Tampa Bay generated the greatest number of boat trips with an average of 52.3 trips per year/boater and 45.2 trips per year/boater, respectively. Dock users in Sarasota were third-highest, with an average of 47.4 trips per year/boater, followed Sarasota Bay marina wet-slip users who averaged of 43.4 trips per year/boater (Table 17c; Question 10).

Table 17a. Pleasure Boat Trips: Monthly Averages and Trip Counts.

Month	N	Monthly average	Rank	Total trips	% of Grand total
January	1570	2.58	12	4049	6.0
February	1568	2.79	10	4369	6.5
March	1563	3.64	8	5516	8.2
April*	1562	4.11**	3	6434	9.6
May*	1561	4.40**	1	6864	10.3
June*	1563	4.28**	2	6685	10.0
July*	1565	4.02**	4	6297	9.4
August*	1563	3.80	5	5940	8.9
September*	1564	3.75	6	5870	8.8
October*	1565	3.67	7	5747	8.6
November	1564	3.20	9	5011	7.5
December	1568	2.61	11	4092	6.1

Grand Total = 66,874 trips

Overall Monthly Average = 3.57 trips per boater per month

* denotes months in which average number of trips per boater exceeds overall monthly average of 3.57 trips per boater per month.
** denotes peak months (top 4); rank is shown in descending order (based on monthly averages).

Table 17b. Total Trips During "Peak" Season (by Location / Departure Category).

Location/Departure Category		N	Total	Average	Median
		Boat Trips			
SB	Marina Wet Slip	156	2,649	16.9*	12
SB	Marina Dry Storage	117	1,831	15.7	13
SB	Ramp	109	2,457	22.5*	15
SB	Dock	240	4,086	17.0*	12
TB	Marina Wet Slip	273	4,008	14.7	12
TB	Marina Dry Storage	240	3,795	15.8	14
TB	Ramp	234	4,316	18.4*	15
TB	Dock	189	3,138	16.6	14
Overall		N = 1556	66,842	16.9	13

Key: SB = Sarasota Bay; TB = Tampa Bay; N = number of respondents.
*denotes at or above the average value of 16.9.

Table 17c. Total Yearly Trips (by Location / Departure Category).

Location/Departure Category		N	Total	Average	Median
		Boat Trips			
SB	Marina Wet Slip	156	6,774	43.4*	31
SB	Marina Dry Storage	116	4,540	39.1	33
SB	Ramp	109	5,702	52.3*	37
SB	Dock	240	11,377	47.4*	34
TB	Marina Wet Slip	273	10,907	40.0	33
TB	Marina Dry Storage	240	9,127	38.0	33
TB	Ramp	233	10,529	45.2*	33
TB	Dock	189	7,886	41.7	34
Overall		N = 1,556	66,842	43.0	33

Key: SB = Sarasota Bay; TB = Tampa Bay; N = number of respondents.
*denotes above average values.

Rationale for Selecting Departure Sites, Travel Routes, and Destinations

This section describes the choice rationale for selecting departure sites (i.e., marina, ramp, or dock), travel routes, and favorite destinations. The top-five reasons for selecting a departure site, travel route, or favorite destination are shown in parentheses in the following tables.

- Respondents preferred departure sites that were close to their home and close to their favorite boating spots. Proximity to home and boating spots were the top-two preferences with 35.7% and 21.9% of the responses, respectively. The ease of the launch and retrieval of their boat (10.5% of the responses) were also important site considerations for respondents (Table 18; Question 17).

Table 18. Most-important Reason for Selecting a Favorite Departure Site (by Category).

Category / Description	Count	Percent	
(a) close to home	298	35.7%	(1)
(b) close to favorite boating spots	183	21.9%	(2)
(c) there is no parking or launching fee	14	1.7%	
(d) there is adequate parking	29	3.5%	
(e) don’t have to wait too long to launch	33	4.0%	(5)
(f) the parking is safe and secure	18	2.2%	
(g) prefer deep water access	61	7.3%	(4) tie
(h) nearby amenities (restaurant, mini mart, etc.)	20	2.4%	
(i) well-marked channel access	13	1.6%	
(j) ease of launching and retrieving boat	88	10.5%	(3)
(k) gas, pump-out, or maintenance services	12	1.4%	
(l) availability of restrooms	2	0.2%	
(m) availability of fishing supplies, including bait	3	0.3%	
(n) other reason	61	7.3%	(4) tie
	N = 835		

- Easy access to favorite boating spots (35.9%) and scenic beauty (21.1%) were the top two responses, accounting for 57% of the most important reasons for selecting a favorite pleasure boating route. Respondents also indicated a preference for avoiding shallow waters (8.2%) and avoiding congested areas (7.5%). A small percentage of respondents indicated no route preference (4.1%) by identifying that they "just cruise around" (Table 19; Question 12)

Table 19. Most-important Reason for Selecting a Favorite Pleasure Boating Route (by Category).

Category / Description	**Count**	**Percent***	
(a) easy access to favorite boating spots	481	35.9%	(1)
(b) scenic beauty	282	21.1%	(2)
(c) avoid shallow water	110	8.2%	(4)
(d) prefer calm waters	72	5.4%	
(e) avoid congested areas	100	7.5%	(5)
(f) avoid manatee zones	8	0.6%	
(g) easy access to supplies or marina	26	1.9%	
(h) avoid speed zones	12	0.9%	
(i) prefer well-marked channels	78	5.8%	
(j) none are important (I just cruise around)	55	4.1%	
(k) other	115	8.6%	(3)
	N = 1,339		

- Respondents overwhelmingly cited fishing opportunities (35.6% of responses) as the most important reason for selecting a favorite boating destination. Scenic beauty (12.8% of responses) and calm protected waters (11.3% of responses) were also of great importance, as was availability of shore entertainment and restaurants (7.0% of responses), a natural/undeveloped shoreline (5.9% of responses), and places where boaters could avoid crowds (5.1% of responses) (Table 20; Question 20).

Table 20. Most-important Reason for Selecting a Favorite Boating Destination (by Category).

Category / Description	**Count**	**Percent**	
(a) prefer calm protected waters	168	11.3%	(3)
(b) enjoy scenic beauty	191	12.8%	(2)
(c) prefer a natural/undeveloped shoreline	88	5.9%	(5)
(d) preference to observe wildlife	35	2.3%	
(e) fishing opportunities are important	531	35.6%	(1)
(f) swimming / shelling opportunities	70	4.7%	
(g) avoid crowds	76	5.1%	(honorable mention)
(h) availability of shoreline entertainment/restaurants	105	7.0%	(4)
(i) availability of fuel or fishing supplies	15	1.0%	
(j) beaches for picnicking / socializing	56	3.8%	
(k) to socialize with other boater	51	3.4%	
(l) I have no favorite spots. I just cruise around	74	5.0%	(honorable mention)
(m) Other reason	33	2.1%	
	N = 1,493		

Activity Profile

A description of the recreational boating activities reported by respondents is presented in this section. The results are based on answers to Question 18 and reflect a ranking of chosen activities. 'Count' is, therefore, equal to the total number of times a given activity was chosen. Since many respondents selected multiple activities from the list percentages will sum to more than 100 percent. The top-five activities are shown in parentheses.

- Fishing ranked as the leading activity with 64% of respondents indicating that they engaged in this activity during a typical pleasure boating trip. Cruising was the second-most selected activity with a percentage of 58.7%., followed by nature viewing (42.8% of responses), beach camping (41.3% of responses), and sightseeing with 40.8% of responses (Table 21; Question 18).

Table 21. Breakdown of Boaters' Activities by Category (Entire study region).

Activity/Category	Count	N	Percentage of respondents
Beach Picnicking	502	1,648	30.5%
Nature Viewing	706	1,648	42.8% (3)
Sightseeing	672	1,648	40.8% (5)
Beach Camping	680	1,648	41.3% (4)
Daytime Anchoring	501	1,647	30.4%
Socializing	658	1,648	39.9%
Cruising	968	1,648	58.7% (2)
Overnight Anchoring	308	1,648	18.7%
Visit Restaurant	644	1,648	39.1%
Diving	212	1,648	12.9%
Sailing	302	1,648	18.3%
Swimming	649	1,648	39.4%
Fishing	1,055	1,648	64.0% (1)
Other	112	1,648	6.8%

- Cruising was the number-one activity for boaters that departed from marina wet-slips in Sarasota Bay (79.9% of responses), followed by socializing and visiting restaurants (tied for second place with 45.7% of responses). Nature viewing and sightseeing were tied for third place (43.9% of responses), followed by sailing (fourth with 39.6% of responses) and daytime anchoring (fifth with 39.2% of responses). Note that less than 1% of respondents in this category selected beach camping (Table 22a; Question 18).

Table 22a. Breakdown of Boaters' Activities by Category for Sarasota Bay (Marina Wet-Slip Departure).

Activity/Category	Count	N	Percentage of respondents
Beach Picnicking	29	164	17.7%
Nature Viewing	72	164	43.9% (3) tie
Sightseeing	72	164	43.9% (3) tie
Beach Camping	1	164	0.6%
Daytime Anchoring	64	164	39.2% (5)
Socializing	75	164	45.7% (2) tie
Cruising	131	164	79.9% (1)
Overnight Anchoring	63	164	38.4%
Visit Restaurant	75	164	45.7% (2) tie
Diving	20	164	12.2%
Sailing	65	164	39.6% (4)
Swimming	60	164	36.6%
Fishing	63	164	38.4%
Other	9	164	5.5%

- Fishing was the top-ranked activity among respondents that departed from dry-storage facilities in Sarasota Bay, with a 70% response rate, followed by cruising (58.7% of responses), visiting restaurants (51%), nature viewing (46% of responses) and sightseeing (45.2% of responses). Swimming deserves an honorable mention, with over 40% of boaters selecting this activity. Less than 2% of respondents in the Sarasota marina dry-storage category chose sailing or beach camping as a response (Table 22b; Question 18).

Table 22b. Breakdown of Boaters' Activities by Category for Sarasota Bay (Marina Dry-Storage Departure).

Activity/Category	Count	N	Percentage of respondents
Beach Picnicking	36	126	28.6%
Nature Viewing	58	126	46.0% (4)
Sightseeing	57	126	45.2% (5)
Beach Camping	2	126	1.6%
Daytime Anchoring	35	126	27.8%
Socializing	46	126	36.5%
Cruising	74	126	58.7% (2)
Overnight Anchoring	4	126	3.2%
Visit Restaurant	64	126	51.0% (3)
Diving	10	126	7.9%
Sailing	2	126	1.6%
Swimming	52	126	41.3% (honorable mention)
Fishing	88	126	69.8% (1)
Other	7	126	5.6%

- Fishing ranked as the leading activity among respondents that launched from ramps in the Sarasota Bay area (over 87% of respondents acknowledged it as an activity that they engage in). Swimming ranked second (43.6% of responses), followed by nature viewing (42.7% of responses), sightseeing (36.8% of responses), and cruising (34.2% of responses). Sailing and overnight anchoring ranked low on the list with collectively less than 4% of the responses (Table 22c; Question 18).

Table 22c. Breakdown of Boaters' Activities by Category for Sarasota Bay (Ramp Launch).

Activity/Category	Count	N	Percentage of respondents	
Beach Picnicking	32	117	27.4%	
Nature Viewing	50	117	42.7%	(3)
Sightseeing	43	117	36.8%	(4)
Beach Camping	18	117	15.4%	
Daytime Anchoring	25	116	21.6%	
Socializing	30	117	25.6%	
Cruising	40	117	34.2%	(5)
Overnight Anchoring	3	117	2.6%	
Visit Restaurant	23	117	19.7%	
Diving	22	117	18.8%	
Sailing	1	117	0.9%	
Swimming	51	117	43.6%	(2)
Fishing	102	117	87.2%	(1)
Other	8	117	6.8%	

- Fishing ranked as the number-one activity of respondents that departed from docks in Sarasota Bay (with over 70% of the respondents acknowledging it in the survey). Cruising (63% of responses) and visiting restaurants (55.1% of responses) were also prominent activities for this boater category, followed by sightseeing (48.8% of responses) and nature viewing (48.4% of responses). Deserving honorable mention are swimming and socializing, both with a 40% plus response rate (Table 22d; Question 18).

- Cruising (71.6% of responses) and sailing (61.4% of responses) were the top-two activities of respondents that departed from marina wet-slips in the Tampa Bay area. Overnight anchoring (46% of responses) and nature viewing and socializing (tied with 45% of responses) also ranked high for boaters in this category, followed by sightseeing (42% of responses) and daytime anchoring which received honorable mention with 31% of responses (Table 22e; Question 18).

Table 22d. Breakdown of Boaters' Activities by Category for Sarasota Bay (Dock Departure).

Activity/Category	Count	N	Percentage of respondents
Beach Picnicking	92	256	36.0%
Nature Viewing	124	256	48.4% (5)
Sightseeing	125	256	48.8% (4)
Beach Camping	6	256	2.3%
Daytime Anchoring	80	256	31.3%
Socializing	112	256	43.8% (honorable mention)
Cruising	160	256	63.0% (2)
Overnight Anchoring	24	256	9.8%
Visit Restaurant	141	256	55.1% (3)
Diving	31	256	12.1%
Sailing	32	256	12.5%
Swimming	115	256	45.0% (honorable mention)
Fishing	180	256	70.3% (1)
Other	19	256	7.4%

Table 22e. Breakdown of Boaters' Activities by Category for Tampa Bay (Marina Wet-Slip Departure).

Activity/Category	Count	N	Percentage of respondents
Beach Picnicking	68	289	23.5%
Nature Viewing	130	289	45.0% (4) tie
Sightseeing	121	289	42.0% (5)
Beach Camping	6	289	2.1%
Daytime Anchoring	120	289	41.5% (honorable mention)
Socializing	130	289	45.0% (4) tie
Cruising	207	289	71.6% (1)
Overnight Anchoring	133	289	46.0% (3)
Visit Restaurant	107	289	37.0%
Diving	35	289	12.1%
Sailing	163	289	56.4% (2)
Swimming	110	289	38.1%
Fishing	102	289	35.3%
Other	19	289	6.6%

- Fishing ranked as primary activity for respondents associated with marina dry-storage in the Tampa Bay region (70.7% of responses). Cruising (61.8% of responses), socializing (43.1% of responses), nature viewing (42.3% of responses), and restaurant visitation (41.9% of responses) also ranked high. Beach picnicking (39% of responses), sightseeing (39.4% of responses), and swimming (37.4% of responses) deserve honorable mention (Table 22f; Question 18).

Table 22f. Breakdown of Boaters' Activities by Category for Tampa Bay (Marina Dry-Storage Departure).

Activity/Category	Count	N	Percentage of respondents
Beach Picnicking	96	246	39.0% (honorable mention)
Nature Viewing	104	246	42.3% (4)
Sightseeing	97	246	39.4% (honorable mention)
Beach Camping	13	246	5.3%
Daytime Anchoring	87	246	35.4%
Socializing	106	246	43.1% (3)
Cruising	152	246	61.8% (2)
Overnight Anchoring	33	246	13.4%
Visit Restaurant	103	246	41.9% (5)
Diving	33	246	13.4%
Sailing	11	246	4.5%
Swimming	92	246	37.4% (honorable mention)
Fishing	174	246	70.7% (1)
Other	18	246	7.3%

- Fishing (90.8% of responses) dominated as an activity for respondents that launched from ramps in the Tampa Bay area. Nature viewing (33.1% of responses) and swimming (32.7% of responses) ranked second and third, respectively, followed by cruising (31.1% of responses) and beach picnicking (30.3% of responses). Deserving honorable mention are sightseeing (29.1% of responses) and socializing (26.7% of responses). Sailing was the least-cited response with just over one-percent of responses (Table 22g; Question 18).

Table 22g. Breakdown of Boaters' Activities by Category for Tampa Bay (Ramp Launch).

Activity/Category	Count	N	Percentage of respondents
Beach Picnicking	76	251	30.3% (5)
Nature Viewing	83	251	33.1% (2)
Sightseeing	73	251	29.1% (honorable mention)
Beach Camping	21	251	8.4%
Daytime Anchoring	35	251	13.9%
Socializing	67	251	26.7% (honorable mention)
Cruising	78	251	31.1% (4)
Overnight Anchoring	12	251	4.8%
Visit Restaurant	43	251	17.1%
Diving	39	251	15.5%
Sailing	3	251	1.2%
Swimming	82	251	32.7% (3)
Fishing	228	251	90.8% (1)
Other	14	251	5.6%

- Cruising was the leading activity for almost two-thirds of the boaters that depart from docks in the Tampa Bay area (63.3% of responses), followed by fishing (59.3% of responses), socializing (46.2% of responses), restaurant visitation (44.2% of responses), and swimming (43.7% of responses) to round out the top-five. Nature viewing and sightseeing deserve honorable mention, each had a response rate greater than 40%. Beach camping was cited by less than one percent of the respondents in this category. (Table 22h; Question 18).

Table 22h. Breakdown of Boaters' Activities by Category for Tampa Bay (Dock Departure).

Activity/Category	**Count**	**N**	**Percentage of respondents**	
Beach Picnicking	73	199	36.7%	
Nature Viewing	85	199	42.7%	(honorable mention)
Sightseeing	84	199	42.2%	(honorable mention)
Beach Camping	1	199	0.5%	
Daytime Anchoring	55	199	27.6%	
Socializing	92	199	46.2%	(3)
Cruising	126	199	63.3%	(1)
Overnight Anchoring	36	199	18.1%	
Visit Restaurant	88	199	44.2%	(4)
Diving	22	199	11.1%	
Sailing	25	199	12.6%	
Swimming	87	199	43.7%	(5)
Fishing	118	199	59.3%	(2)
Other	18	199	9.0%	

Perceived Congestion

The summary of perceived congestion is based on responses to Questions 21 and 22 of the survey. Congestion was defined in the questionnaire as the presence of "more boats than you prefer."

- Approximately 33% of the boaters that participated in the survey answered "yes" to Questions 21 and 22. In other words, one out of every three respondents both identified congested areas on the map and indicated that they had avoided or left congested areas while boating (Table 23; Question 21 and 22).

Table 23. Analysis of Congestion: Proportion of Boaters that Both Identified Congested Areas ***and*** Indicated that They had Avoided or Left Congested Areas (Entire Study Region).

N = 1,597*
Count = 520** (32.6%)

* denotes the number of boaters that responded to both questions
** denotes the number of boaters that responded "yes" to both questions

- Respondents that launched from ramps tended to view on-water congestion as more of an issue than boaters in other categories. Boaters associated with marina dry-storage also had an above average tendency to identify congestion as a problem. Boaters that departed from docks or marina wet-slips were the least likely to indicate congestion as a problem (Table 24; Questions 21 and 22).

Table 24. Analysis of Congestion: Proportion of Boaters that Both Identified Congested Areas on the Map ***and*** Indicated that they had Avoided or Left Congested Areas (by Location and Launch Category).

Location/Departure Category	N	Count	Percentage	Above avg.
SB Marina Wet-Slip	155	34	21.9%	no
SB Marina Dry-Storage	122	43	35.2% (3)	yes
SB Ramp	114	43	37.7% (2)	yes
SB Dock	244	66	27.1%	no
TB Marina Wet-Slip	284	74	26.1%	no
TB Marina Dry-Storage	244	82	33.6% (4)	yes
TB Ramp	242	117	48.4% (1)	yes
TB Dock	192	61	31.8%	no
	Total = 1,597			

Key: SB = Sarasota Bay; TB = Tampa Bay; N = number of respondents.
Top-4 percentage values shown in parentheses.

- Boaters that used ramps and marina dry-storage had a higher propensity to indicate avoidance of congested areas in comparison to boaters in other location/departure categories. Boaters from marina wet-slips were least likely to comment about avoidance of congested areas (Table 25 Question 21).

Table 25. Avoidance of Congested Areas (by Departure Category).

Location/Departure Category	N	Count	Percentage	At or Above avg.
SB Marina Wet-Slip	158	52	33.0%	no
SB Marina Dry-Storage	122	59	48.4% (3)	yes
SB Ramp	115	60	52.2% (2)	yes
SB Dock	246	86	35.0%	no
TB Marina Wet-Slip	288	102	35.4%	no
TB Marina Dry-Storage	244	114	46.7% (4)	yes
TB Ramp	246	141	57.3% (1)	yes
TB Dock	193	84	44.0%	yes
Overall	Total = 1,612	698	43.3%	

Key: SB = Sarasota Bay; TB = Tampa Bay.
Top-4 percentage values shown in parentheses.

Perceived Problems and Solutions to Problems

This chapter summarizes the responses to the following survey questions:

> **Question 30**. "What detracts most from your boating experiences in the Tampa or Sarasota Bay areas?"
>
> **Question 31**. "What is needed most to improve your recreational boating experiences in the Tampa or Sarasota Bay areas?"
>
> **Question 32**. "What kinds of information would improve your boating experiences in the Tampa or Sarasota Bay areas?"

A typology of primary and secondary detractors (i.e., problems), needs (i.e., solutions to problems), and information requests was developed through a content analysis of the responses to each of the three questions listed above. The content analysis was based on information from N=1,908 surveys returned (as of 12/31/03).

Detractors

A summary of primary factors that detracted most from recreational boating experiences is presented in Table 26. ***Lack of seamanship or courtesy*** (i.e., boaters that either don't know or don't follow the rules) was the leading detractor, accounting for 47.4% of the N = 1,900 total responses to Question 30. Respondents cited ***congestion*** at favorite destinations or at ramps as the second-leading detractor with approximately 15.2% of the total responses. These two detractors accounted for almost two-thirds of all responses to Question 30. ***Altered environments*** (11.3% of the total responses) consisting of not enough wildlife or natural areas, pollution, and water quality issues ranked third on the list of detractors. ***Management*** factors that included too many or too few restrictions ranked fourth with 10.3% of the total responses. ***Lack of infrastructure*** (8.4% of the total responses), referring to ramps, dockage, and waterway maintenance dredging ranked fifth. ***Water depth,*** including shallow water or shoaling, accounted for 5.6% of the total responses. Less than 2% of the total responses indicated ***satisfaction*** with existing conditions.

Shallow water hazards such as oyster bars, mud flats, and seagrass flats accounted for 77.4% of the responses in the "Water Depth" category and 4.3% of the total number of responses from the survey (i.e., considering all categories). More specifically, a number of boaters cited ***shoaling in channels and passes*** (22.6% of category; 1.3% of total responses) as a primary detractor (Table 27).

Table 26. Boater Detractors by Primary Category

Primary Detractor Category	Total Responses*	% of Total	Rank**
Water Depth	106	5.6 %	
Altered Environment	216	11.3	3
Congestion	288	15.2	2
Lack of Seamanship or Courtesy	**901**	**47.4**	**1**
Lack of Infrastructure	160	8.4	5
Management	195	10.3	4
Satisfaction	34	1.8	
TOTALS	N = 1,900	100.0	

*'Total responses' identified in each of the tables does not equal the number of surveys returned because many survey respondents either chose not to answer a particular question(s) or identified multiple factors when answering some questions.
**Top-five rankings are listed in descending order of importance.

Table 27. Water Depth Detractors by Sub-Category

Primary Detractor Category/Sub-Category	Total Responses	Category %	Overall Percentage
Water Depth	**106**	**-**	**5.6%**
Shallow water hazards	82	77.4	4.3
Shoaling in channels and passes	24	22.6	1.3

Note: % refers to the sub-category percentage of the responses associated with the category. Overall percentage refers to the percentage of responses tallied from Question 30.

Water quality issues (41.7% of category; 4.7% of overall responses) including dirty or murky water, or red tide was the leading "Altered Environment" detractor, followed by ***too much pollution or trash*** (34.3% of category; 3.9% of overall responses). Together, these sub-categories accounted for 76% of responses in the altered environment category (Table 28). ***Shoreline development*** (third-ranked) and ***not enough wildlife*** (fourth-ranked) accounted for an additional 21.3% of the responses in the category and 2.4% of the total responses. Lastly, a small percentage of responses (2.7% of category; 0.3% of total responses) identified ***not enough natural areas*** (e.g., beaches, islands for recreation) as a detractor.

Congestion, defined in the questionnaire as "more boats than you prefer" was one of the leading detractors overall, accounting for 15.2% of the total responses to Question 30 (Table 29). Congestion was further sub-categorized from responses as taking place at ***favorite destinations*** (78.5% of category; 11.9% of total responses) and at ***boat ramps*** (21.5% of category; 3.3% of total responses).

Table 28. Altered Environment Detractors by Sub-Category

Primary Detractor Category/Sub-Category	Total Responses	Category %	Overall Percentage
Altered Environment	**216**	**-**	**11.3%**
Shoreline development	24	11.1	1.2
Not enough wildlife	22	10.2	1.2
Not enough natural areas	6	2.7	0.3
Too much pollution or trash	74	34.3	3.9
Water quality issues (red tide, dirty or murky water	90	41.7	4.7

Note: % refers to the sub-category percentage of the responses associated with the category. Overall percentage refers to the percentage of responses tallied from Question 30.

Table 29. Congestion Detractors by Sub-Category

Primary Detractor Category/Sub-Category	Total Responses	Category %	Overall Percentage
Congestion	**288**	**-**	**15.2%**
at favorite destinations	226	78.5	11.9
at boat ramps	62	21.5	3.3

Note: % refers to the sub-category percentage of the responses associated with the category. Overall percentage refers to the percentage of responses tallied from Question 30.

The “Lack of Seamanship or Courtesy” category (Table 30) encompassed responses ranging from ***inconsiderate or reckless behavior*** (e.g., kicking up large wakes, speeding, drinking, noise) ***inexperience*** (i.e., lack of boating knowledge) and ***non-compliance*** with boating rules or regulations. ***Inconsiderate or reckless behavior*** was the leading detractor accounting for 68.5% of the category and 31.9% of the total responses. ***Inexperience*** was also cited as a leading detractor (24.4% of category; 11.4% of total responses). Roughly seven percent of responses in the category cited **n*on-compliance*** as a detractor. The top-three sub-category detractors include inconsiderate boaters (14.6%), inconsiderate personal watercraft (PWC) operators (12.4%) and inexperienced boaters (8.3%).

Table 30. Lack of Seamanship or Courtesy Detractors by Sub-Category

Primary Detractor Category/Sub-Category	Total Responses	Category %	Overall Percentage
Lack of Seamanship or Courtesy	**901**	**-**	**47.4%**
Inconsiderate / reckless boating			
PWC operators	240	38.9	12.6
Inconsiderate Boaters	282	45.7	14.8
Speeding PWCs	14	2.3	0.7
Speeding Boaters	69	11.2	3.6
Speeding in general	12	1.9	0.6
SUB-TOTAL	***617***	***68.5***	***32.3***
Inexperience			
Inexperienced PWC operators	35	15.9	1.8
Inexperienced Boaters	161	73.2	8.5
Inexperience in general	24	10.9	1.3
SUB-TOTAL	***220***	***24.4***	***11.6***
Non-compliance			
Non-compliance w/manatee protection zones	2	3.2	0.1
Non-compliance w/speed zones	7	10.9	0.4
Non-compliance w/no-wake zones	7	10.9	0.4
Non-compliance w/no motor zones	2	3.2	0.1
Non-compliance in general	7	10.9	0.4
Drunk Boaters	35	54.7	1.9
Theft or Vandalism	4	6.3	0.2
SUB-TOTAL	***64***	***7.1***	***3.5***

Note: % refers to the sub-category percentage of the responses associated with the category. Overall percentage refers to the percentage of responses tallied from Question 30.

In the “Lack of Infrastructure” category (Table 31) ***lack of ramps*** (28.1% of category; 2.4% of the total responses) was cited as the number one detractor from the recreational boating experience, followed by ***inadequate channel marking*** (25.6% of category; 2.2% of the total response). ***Inadequate waterway maintenance*** (dredging of residential canals, channels and passes) and ***lack of boat accessible restaurants*** were also important detractors, with each factor accounting for about 18% of the category and 1.5% of the total responses**.** Nevertheless, the overall percentage of responses associated with these sub-categories is small in terms of the number of times these factors were observed as responses in the survey, with each sub-category accounting for less than 2.5% of the total responses.

Table 31. Lack of Infrastructure Detractors by Sub-Category

Primary Detractor Category/Sub-Category	Total Responses	%	Overall Percentage
Lack of Infrastructure	**160**	**-**	**8.4%**
Quality			
Inadequate channel marking	41	25.6	2.2
Inadequate waterway maintenance (canals, channels, passes)	29	18.1	1.5
Inadequate docking / ramp facilities	16	10.0	0.8
SUB-TOTAL	***86***	***53.7***	***4.5***
Quantity			
Lack of ramps	45	28.1	2.4
Lack of restaurants (dockage and moorings)	29	18.2	1.5
SUB-TOTAL	***74***	***46.3***	***3.9***

Note: % refers to the sub-category percentage of the responses associated with the category. Overall percentage refers to the percentage of responses tallied from Question 30.

"Management" detractors (Table 32) were classified according to those respondents who cited ***too much management*** (i.e., too many regulations and law enforcement) and those that cited ***too little management*** (i.e., not enough law enforcement of boating safety rules and environmental regulations). ***Too much management*** accounted for approximately 9% of the total responses, with the ***too many manatee restriction zones*** sub-category chosen as the leading detractor within this category (39.7% of the category responses). Note, however, that the ***too many manatee restriction zones*** sub-category accounted for only 3.6% of the total responses in the survey. Overall, the ***too little management*** category accounted for slightly more than 1% of the total responses in the survey. For the 21 responses associated with this category, 17 (or 81%) cited ***not enough fishing regulations*** and, more specifically, the proliferation of crab traps as the greatest detractor.

Table 32. Management Detractors by Sub-Category

Detractor Category/Sub-Category	**Total Responses**	**%**	**Overall Percentage**
Management	**195**	**-**	**10.3**
Too Much Management			
Too much law enforcement	29	16.6	1.5
Too many regulations (in general)	8	4.6	0.4
Too many manatee restriction zones	69	39.7	3.6
Too many bird/wildlife sanctuaries	5	2.9	0.3
Too many speed zones	26	14.9	1.4
Too many no-wake zones	36	20.7	1.2
Too many fishing regulations	1	0.6	0.001
SUB-TOTAL	***174***	**-**	***9.2***
Too Little Management			
Not enough law enforcement	0	0.0	0.0
Not enough regulations (in general)	4	19.0	0.2
Not enough manatee zones	0	0.0	0.0
Not enough bird/wildlife sanctuaries	0	0.0	0.0
Not enough fishing regulations (proliferation of crab traps)	17	81.0	0.9
SUB-TOTAL	***21***	**-**	***1.1***

Note: % refers to the sub-category percentage of the responses associated with the category. Overall percentage refers to the percentage of responses tallied from Question 30.

The top-ten detractors by sub-category account for 1,290 (or 66.9%) of the N = 1,900 total responses to Question 30 (Table 33). The overwhelming majority of responses (27% of overall responses) cited “inconsiderate” boaters and PWC operators as the greatest detractors of recreational boating experiences, followed by congestion at favorite destinations (ranked third) and boater inexperience (ranked fourth). Environmental detractors including water quality issues (4.7% of overall responses) and shallow water hazards (4.3% of overall responses) round out the top-five detractors.

Table 33. Top-10 Detractors by Sub-Category

Rank	Detractor Sub-category	# of Responses	Overall Percentage
1	Inconsiderate Boaters	282	14.8%
2	Personal Water Craft	240	12.6
3	Congestion at Favorite Destinations	226	11.9
4	Inexperienced Boaters	161	8.5
5	Water Quality Issues	90	4.7
6	Shallow Water (depth)	82	4.3
7	Pollution or Trash/Debris	74	3.9
8 (tie)	Too Many Manatee Restriction Zones	69	3.6
8 (tie)	Speeding Boaters	69	3.6
9	Congestion at Ramps	62	3.2
10	Lack of Ramps	45	2.3

Needs

A summary of boater needs by primary category is presented in Table 34. ***Infrastructure improvements*** was the factor most often requested to improve recreational boating experiences accounting for 41.6% of the N = 2,103 total responses to Question 31. ***Management*** needs including the need for more management (i.e., more regulations or better enforcement of existing regulations) or less management (i.e., fewer regulations) ranked second with 32.1% of the total responses. These two factors accounted for almost three-quarters of all responses to Question 31. ***Education*** ranked third on the list of needs with 13.6% of the total responses, followed by ***environmental protection*** (10.7% of the total responses), and ***satisfied*** with existing conditions (2.0% of the total responses).

Improved water quality, encompassing less runoff, pollution, and red tide was identified as the leading “Environmental Protection” need with 55.1% of the category; 5.9% of the total response. This was followed by ***fewer boaters*** (18.2% of category; 1.9% of total response) and ***more fish*** (11.1% of category; 1.2% of total response). Together, these three sub-categories accounted for approximately 84% of responses in the environmental protection needs category (Table 35). Roughly 16% of the environmental protection needs category responses fell into the sub-categories described as ***more natural areas*** (5.3%), ***less shoreline development*** (4.4%), and ***protection of seagrass*** (5.8%).

Table 34. Boater Needs by Primary Category

Primary Needs Category	Total responses*	% of Total	Rank**
Environmental Protection	225	10.7 %	4
Management	674	32.1	2
Education	286	13.6	3
Infrastructure Improvements	**856**	**41.6**	**1**
Satisfied	143	2.0	5
TOTALS	N = 2,184	100	

*'Total responses' identified in each of the tables does not equal the number of surveys returned because many survey respondents either chose not to answer a particular question or identified multiple factors when answering some questions.

**Top-five rankings are listed in descending order of importance.

Table 35. Environmental Protection Needs by Sub-Category

Primary Needs Category/Sub-Category	Total Responses	Category %	Overall Percentage
Environmental Protection	**225**	**-**	**10.7%**
Improved water quality (less runoff, pollution, red tide)	124	55.1	5.9
Protection of seagrass	13	5.8	0.6
More fish	25	11.1	1.2
Less shoreline development	10	4.4	0.5
More natural areas (islands and beaches)	12	5.3	0.6
Fewer boaters / congestion	41	18.2	1.9

Note: % refers to the sub-category percentage of the responses associated with the category. Overall percentage refers to the percentage of responses tallied from Question 31.

"Management" needs (Table 36) were classified according to those respondents that cited the general need for ***more management / enforcement*** of existing regulations (76.9% of category; 24.5% of total responses) and those that generally wanted ***less management / enforcement*** (23.1% of category; 7.4% of total responses). ***More patrols*** (21.3% of category; 6.8% of total responses), greater ***PWC restrictions*** (15.4% of category; 4.9% of total responses), and ***mandatory licensing*** for boat operators (11.3% of category; 3.6% of total responses) were identified as the top-three management needs. Better enforcement of speeding and existing ***speed zones*** (9.3% of category; 2.9% of total responses) and fewer ***manatee protection zones*** (7.5% of category; 2.4% of total responses) round out the top-five boating management needs. In addition, a number of respondents (3.1% of category) cited the specific need for the establishment of ***designated areas for PWC*** operation, and the need for restrictions to eliminate the "haphazard" placement of crab traps, especially near channels (5.4% of category).

Table 36. Management Needs by Sub-Category

Primary Needs Category/Sub-Category	Total Responses	Category %	Overall Percentage
Management	**670**	**-**	**31.9%**
More Management / Enforcement			
PWC restrictions	103	15.4	4.9
Designated areas for PWC*	21	3.1	1.0
Power boat restrictions	20	3.0	1.0
Speed zones	62	9.3	2.9
No wake zones	33	4.9	1.6
More patrols	143	21.3	6.8
Drinking	21	3.1	1.0
Mandatory licensing	76	11.3	3.6
Commercial fishing (crab trap placement)	36	5.4	1.7
SUB-TOTAL	***519***	***76.9***	***24.5***
Less Management / Enforcement			
General – Non-Specific	24	3.6	1.1
Beach / island access	13	1.9	0.6
Speed zones	25	3.7	1.2
No wake zones	36	5.4	1.7
Manatee protection zones	50	7.5	2.4
Fewer Patrols	5	0.7	0.2
Drinking	2	0.3	0.1
SUB-TOTAL	***155***	***23.1***	***7.4***

Note: % refers to the sub-category percentage of the responses associated with the category. Overall percentage refers to the percentage of responses tallied from Question 31. *PWC refers to personal watercraft

The majority of the responses (81.1%) in the "Education Needs" category identified ***education*** as a need but did not distinguish between the type of user or boat operator (Table 37). A small number of responses (5.2% of category; 0.7% of total responses) identified ***PWC operators*** specifically as the target boater population in need of education. A number of survey respondents also requested that special training be required for people that rent boats and PWC. Also, 13.6% of responses in the category cited the need for better boater ***courtesy / etiquette***.

Table 37. Education Needs by Sub-Category

Primary Needs Category/Sub-Category	Total Responses	Category %	Overall Percentage
Education	**286**	**-**	**13.6%**
General education	232	81.1	11.0
For PWC operators	15	5.2	0.7
Courtesy / etiquette	39	13.6	1.9

Note: % refers to the sub-category percentage of the responses associated with the category. Overall percentage refers to the percentage of responses tallied from Question 31.

The “Infrastructure Improvements” category (Table 38) is characterized by two sub-categories of responses: ***Quality***, referring to the need to improve the condition of the infrastructure (56.1% of category; 22.8% of total responses) and ***quantity,*** referring to the need for more of a certain type of infrastructure (43.9% of category; 17.9% of total responses).

Improved channel marking (20.3% of category; 8.5% of total responses) was cited as the number one infrastructure need. This was followed by ***more ramps*** (17.8% of category; 7.2% of total responses), ***improved dredging*** of channels and passes (17.4% of category; 7.1% of total responses), and ***improved ramp facilities*** (e.g., parking, fresh water for engine flushing, security) accounting for 14.3% of category; 5.8% of total responses. Note that the overall percentage of responses associated with these four sub-categories is significant, accounting for almost 30% of the total number of responses to Question 31. ***More dockage*** (e.g., “lower cost” marina slips, restaurant dockage, moorings, and anchorages) rounds out survey respondents’ top-five infrastructure needs.

Table 38. Infrastructure Needs by Sub-Category

Primary Needs Category/Sub-Category	**Total Responses**	**%**	**Overall Percentage**
Infrastructure	**856**	**-**	**40.8%**
Quality			
Improved channel marking	178	20.8	8.5
Improved signage	31	3.6	1.5
Improved dredging (channels and passes)	149	17.4	7.1
Improved ramp facilities	122	14.3	5.8
SUB-TOTAL	***480***	***56.1***	***22.8***
Quantity			
More ramps	152	17.8	7.2
More dockage (slips, moorings, anchorages)	85	9.9	4.0
Pumpout / fuel	25	2.9	1.2
Restaurants with docks	58	6.8	2.8
Artificial reefs	56	6.5	2.7
SUB-TOTAL	***376***	***43.9***	***17.9***

Note: % refers to the sub-category percentage of the responses associated with the category. Overall percentage refers to the percentage of responses tallied from the total responses to Question 31.

The top-ten needs by sub-category account for 1,364 (or 64.8%) of the N=2,103 total responses to Question 31 (Table 39). The need for ***general education*** (11.0% of total responses) was cited as the top factor necessary to improve recreational boating experiences, followed by ***improved channel marking*** (8.5% of overall responses), and ***more ramps*** (7.2% of overall responses). Improved ***maintenance dredging*** of waterways and especially passes (e.g., Midnight Pass and Big Sarasota Pass) was ranked as the fourth highest need. More

marine patrols to address “inappropriate and reckless boating”, and enforcement of existing speed and no-wake zones rounds out the top-five greatest needs.

Table 39. Top-10 Needs by Sub-Category

Rank	Sub-Category	# of responses	overall percentage
1	Education	232	11.0%
2	Improved channel marking	178	8.5
3	More ramps	152	7.2
4	Dredging of channels and passes	149	7.1
5	More patrols / regulation enforcement	143	6.8
6	Improved water quality	124	5.9
7	Ramp improvements	122	5.8
8	More PWC restrictions	103	4.9
9	Public Dockage (Restaurants)	85	4.0
10	Mandatory Licensing	76	3.6
Overall		1,364	64.8

Information Requests

Specific requests for information have been categorized according to ***information need*** (N = 748) and ***information type*** (N = 437) requests. Fewer respondents completed Question 32 than Questions 30 and 31. The lack of responses to Question 32 regarding specific information needs and the form in which information is circulated or made available seems inconsistent with the need identified by boaters for education. The low response rate for this question may indicate that respondents were either satisfied with currently available information or that other forms of persuasion (e.g., more law enforcement) are considered to be better options to deal with primary detractors including “inconsiderate / reckless boaters.”

“Information Need” requests (Table 40) have been sub-divided into ***facility***, ***activity***, ***regulation***, and ***environment*** sub-categories, reflecting the diversity of boater interests and information needs. The most requested type of information concerned the ***environment*** (33.4% of the N = 748 total responses) and included weather information (e.g., tide, wind, lightning) and bathymetry (e.g., shoaling conditions, shallow water hazards). The second-ranked information need was related to ***activities*** (29.2% of total responses) which encompassed information requests on boating destinations and more specifically, “quiet” or “family” areas, fishing spots, and general requests for information on “places to go” or “places to see” or “things to do.” The ***facilities*** sub-category ranked third (24.0% of total responses) and highlighted information requests regarding boating facilities including marinas, anchorages, ramps, and restaurants with dockage for transient boaters. Respondents also cited the need for information on ***regulations*** (13.4% of total responses) which included existing or proposed regulations concerning boating safety, fishing rules, and restriction zones (e.g., speed zones, manatee zones).

Table 40. Information Requests by Sub-Category

Primary Needs Category/Sub-Category	Total Responses	%	Overall Percentage
Information	**748**	**-**	**-**
Facilities			
Anchorages / marinas	43	23.8	5.7
Ramps	30	16.7	4.0
Restaurants / entertainment	64	35.6	8.6
Boat facilities	43	23.9	5.7
SUB-TOTAL	***180***	***100.0***	***24.0***
Activities			
Destinations (“places to go and see”)	56	25.6	7.5
Fishing spots / information	139	63.8	18.7
Boating events (“things to do”)	23	10.6	3.1
SUB-TOTAL	***218***	***100.0***	***29.2***
Regulations			
In general	43	42.5	5.7
Fishing	22	21.8	2.9
Speed zones	11	10.9	1.5
Manatee zones	13	12.9	1.7
Signage	12	11.9	1.6
SUB-TOTAL	***101***	***100.0***	***13.4***
Environment			
Weather (tide, wind, lightning, seas)	140	56.2	18.8
Bathymetry (shallow areas, shoaling, hazards)	67	26.9	9.0
Water quality	19	7.6	2.5
Habitat and ecology	23	9.3	3.1
SUB-TOTAL	***249***	***100.0***	***33.4***

Note: % refers to the sub-category percentage of the responses associated with the category. Overall percentage refers to the percentage of sub category responses tallied from the total responses that identified an information need.

Of those boaters who identified an “Information Type” or method of circulation, 48.1% of the N = 437 total responses cited the need for “accurate” ***up-to-date charts*** that illustrate shallow water hazards, shoaling areas, waterway markers, and points of recreational interest (Table 41). The second-most requested type of circulation was to make “live” reports concerning weather conditions, water quality, and fishing available over the ***internet*** (11.2% of total responses), or via ***conventional broadcasting media*** (6.4% of responses) such as newspaper, TV, or radio. ***Guide books or pamphlets*** providing information and reviews on boat accessible restaurants, boating destinations (e.g., fishing spots, beaches, islands, “family” places), and habitat and ecology, accounted for 9.2% of the responses. A traditional classroom setting (3.4% of category) was desired by some respondents. A small number of boaters (less than 3% of responses) requested that ***GPS coordinates*** for fishing spots be included in guides or on charts, or that boating information ***signs*** be placed at local ramps. A rather large percentage of responses (19.0%) indicated ***satisfaction*** with existing information.

Table 41. Information Type by Category

Circulation Type Category	**Total Responses**	**Overall Percentage**
Information Source	**437**	**-**
'Up to Date' Charts	210	48.1%
Internet 'Live Reports'	49	11.2
Conventional Broadcasting Media (newspaper, TV, radio)	28	6.4
Guide books or pamphlets	40	9.2
Class	15	3.4
Ramp Signs	5	1.1
GPS coordinates	7	1.6
Satisfied	83	19.0

Note: Overall percentage highlights the sub-category response rate of the total information source responses.

Conclusions

Summary and Future Research Opportunities

This report documents the methods and procedures implemented to survey a representative sample of boaters in the Sarasota and Tampa Bay areas, on the basis of trip departure category. Questionnaire returns confirm that a large and even distribution from each sampled boater category was obtained. An analysis of departure origins, destinations, travel routes, and congested areas has identified and mapped general spatial boating patterns. In addition, a descriptive analysis has characterized trip profiles, activity preferences, and important issues and needs.

An important element of this study was to identify, from the boaters' perspective, the kinds of things that detract most from boating experiences, and what is needed most to improve boating experiences. A content analysis of the open-ended survey questions revealed important boating problems, solutions to problems, and information needs, which could serve as the basis for (1) assessing current management efforts, (2) implementing future management plans, and (3) developing products to enhance boating experiences and instill resource stewardship. In addition, data collected from this study can be blended with similar information collected as part of the recreational boating characterization for Charlotte Harbor. However, it is recommended that a similar boating characterization be conducted for Little Sarasota Bay, and Lemon Bay to account for the geographic gap that exists between the two regional analyses (Charlotte Harbor and Sarasota/Tampa Bay). A future study might also be implemented for the high-use boating region just south of Charlotte Harbor that includes Estero Bay, Rookery Bay, and the Marco Island area.

A subsequent research phase would also (1) explore temporal differences in boating patterns (e.g., time of day, monthly, seasonal), and (2) quantify spatial patterns by boater-group, favorite activities, vessel type, and draft classification. Such temporal and activity-derived spatial profiles could serve as the basis for estimating boating pressure by small area throughout the region. The boating pressure model would incorporate trip length, the number of boating days per month, and time spent on the water as additional variables. Boating pressure could also be estimated by trip departure category type (i.e., marina, ramp, dock) or for individual marinas, ramps, or residential canal neighborhoods.

Trip-departure specific spatial and temporal information collected for this study provides valuable information on boater use-patterns (i.e., where boaters typically begin their voyages and where they go on the water). This information should be of benefit to county resource managers for estimating demand for boating facilities and determining where such facilities are best located from both accessibility and environmental standpoints. Many boaters gain access to bay waters from marinas, dry-storage facilities, and public boat ramps. However, access to the water is becoming increasingly difficult to obtain in light of increasing boater populations, shorefront development in the form of residential canal neighborhoods and condominiums, and regulations that restrict marina expansions and ramp development. A key issue facing coastal county managers is maintaining access to bay waters for a growing boater population. This is complicated by the fact that they are providing infrastructure and facilities to all boaters, including transient users that reside in other counties.

A service area analysis for marine facilities (e.g., ramps, marinas) using the trip-origin specific survey data might be undertaken to determine the geographic extent of the influence (thresholds) of a particular facility to attract boaters. This information could form the basis for projecting future facility demand. A complementary analysis would estimate resource pressure indices for ramps, marinas, and residential canal neighborhoods to quantify the pressure that boating, originating from these types of access points (individual or by category), exerts on bay resources. Geographic overlap in attraction and / or resource pressure thresholds among facilities would help to identify appropriate and inappropriate locations for siting future boating facilities.

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Appendices

Appendix A. Questionnaire and Correspondence

Cover Letter

Recreational Boating
in Tampa and Sarasota Bays

A survey conducted by the University of Florida Sea Grant Program

Dear Boat Owner / Operator,

We are asking you to participate in a boating study being carried out in southwest Florida by the University of Florida Sea Grant Program. The study seeks to characterize boating in the area. Your responses will be very important to our efforts to help southwest Florida Counties prioritize and improve waterway access and maintenance, and to develop map-based boating products that enhance your recreational boating experience. There are no direct risks to you for participating in this study and we are enclosing a copy of "A Tackle Box Guide to Fish in Southwest Florida" and a "Tampa Bay Boater's Guide" to thank you for completing and returning this questionnaire.

The questionnaire should take about 20 minutes to complete. We would appreciate it if you could complete and return it as soon as possible. We have provided a self-addressed, postage-paid return envelope. **Please be assured that the information you provide will be held in the strictest confidence. Answers will NOT be traced to individuals and your name or address will NOT be made available to anyone else**. Your participation is completely voluntary and you may withdraw your participation at any time without penalty. The questionnaire control number is used only to track survey returns so that we don't inconvenience you with reminder cards.

Only a small sample of boaters in the Tampa and Sarasota Bay areas has received this survey, so your input is very important. We recently completed a similar boating survey in the Charlotte Harbor area and it was a great success!

For questions about your rights as a research participant, you may contact the University of Florida Institutional Review Board at PO Box 112250, Gainesville, FL 32611 or 352-392-0433. If you have any questions about this survey or our products for boaters, you may contact Charles Sidman at the University of Florida (352) 392-6233, or by email at boatsurvey@ifas.ufl.edu

We are most grateful for your assistance in this important project.

Questionnaire (Located in the back folder)

Appendix B. Lists of Marinas and Ramps

SURVEYED MARINAS					
Marina Name	**Region**	**County**	**Dry Slips**	**Wet Slips**	**Total**
Bay Shore Gardens	Sarasota	Manatee	0	91	91
Boca Del Rio	Sarasota	Manatee	0	46	46
Bradenton Beach Marina	Sarasota	Manatee	47	52	99
Cannons Marina	Sarasota	Manatee	0	27	27
Catchers Marina	Sarasota	Manatee	0	24	24
Cove Sound Moorings / Yacht Club	Sarasota	Manatee	0	34	34
Cuts Edge Marina	Sarasota	Manatee	160	27	187
Galati's Perico Harbor	Sarasota	Manatee	100	21	121
Holiday Inn Airport	Sarasota	Manatee	0	51	51
Holmes Beach Marina	Sarasota	Manatee	70	0	70
Island Marine	Sarasota	Manatee	48	19	67
Palm View Marina	Sarasota	Manatee	3	16	19
Regatta Point	Sarasota	Manatee	0	186	186
Riveria Dunes	Sarasota	Manatee	1	57	58
Snead Island Boat Works, Inc	Sarasota	Manatee	8	41	49
Tropic Isles Marina	Sarasota	Manatee	0	14	14
Twin Dolphin Marina	Sarasota	Manatee	0	132	132
Anna Maria Boat Club	Sarasota	Sarasota	0	11	11
Boathouse Long Boat Ltd.	Sarasota	Sarasota	82	0	82
Gulf Wind Marina	Sarasota	Sarasota	160	0	160
Longboat Key Moorings	Sarasota	Sarasota	0	144	144
Marina Jack	Sarasota	Sarasota	0	120	120
Sarasota Yacht Club	Sarasota	Sarasota	0	60	60
The Dock On The Bay	Sarasota	Sarasota	0	9	9
SARASOTA BAY TOTALS	**24 MARINAS**		**679**	**1182**	**1861**
Apollo Beach Marina	Tampa	Hillsborough	10	13	23
Bahia Beach Island Resort	Tampa	Hillsborough	0	6	6
Bahia Beach Marina	Tampa	Hillsborough	127	109	236
Davis Island Yacht Club	Tampa	Hillsborough	18	80	98
Inter Bay Mooring	Tampa	Hillsborough	0	14	14
Mariner's Club	Tampa	Hillsborough	0	56	56
Pipers Marina	Tampa	Hillsborough	14	3	17
Tampa Bayside Marina	Tampa	Hillsborough	209	0	209
Tampa Marina and Yacht Club	Tampa	Hillsborough	0	18	18
ABC Marina	Tampa	Pinellas	0	8	8
Anclote Village Marina	Tampa	Pinellas	70	13	83
Bay Grove Landing	Tampa	Pinellas	23	0	23
Bay Pines Marina	Tampa	Pinellas	0	16	16
Blind Pass Marina Inc	Tampa	Pinellas	0	48	48
Chart House Suites and Marina	Tampa	Pinellas	0	16	16
Clearwater Bay Marina	Tampa	Pinellas	46	20	66
Clearwater Municipal Marina	Tampa	Pinellas	0	64	64
Clearwater Yacht Club	Tampa	Pinellas	0	21	21

SURVEYED MARINAS (CONTINUED)					
Marina Name	**Region**	**County**	**Dry Slips**	**Wet Slips**	**Total**
Cove Cay Marina	Tampa	Pinellas	3	6	9
Cruising World Marina	Tampa	Pinellas	0	9	9
Fort DeSota Boat Storage	Tampa	Pinellas	31	0	31
Gandy Bridge Marina	Tampa	Pinellas	0	18	18
Great American Marina	Tampa	Pinellas	4	29	33
Gulf Port Municipal Marina	Tampa	Pinellas	17	132	149
Harborage Marina	Tampa	Pinellas	172	136	308
High and Dry Marina	Tampa	Pinellas	17	5	22
Holiday Inn Harbourside	Tampa	Pinellas	0	22	22
Holiday Inn Sunspree Resort	Tampa	Pinellas	0	17	17
Imperial Yacht Center	Tampa	Pinellas	0	152	152
Isla Del Sol	Tampa	Pinellas	0	1	1
Island Harbor Marina	Tampa	Pinellas	87	31	118
John's Pass Marina	Tampa	Pinellas	76	0	76
Largo Intercoastal Marine	Tampa	Pinellas	149	0	149
Lighthouse Point Marina	Tampa	Pinellas	101	27	128
Madeira Beach Yacht Club	Tampa	Pinellas	0	41	41
Marker 1 Marina	Tampa	Pinellas	58	98	156
Marsh Harbor Marina	Tampa	Pinellas	9	5	14
Maximo Marina	Tampa	Pinellas	0	124	124
O'Neils's Marina	Tampa	Pinellas	88	46	134
Ozona Shores Marina	Tampa	Pinellas	45	0	45
Pasadena Marina	Tampa	Pinellas	31	0	31
Pats Landing Marina	Tampa	Pinellas	54	0	54
Renaissance Vinoy Resort	Tampa	Pinellas	0	33	33
Safety Harbor Marina	Tampa	Pinellas	0	18	18
Sailors Warf Marina	Tampa	Pinellas	6	1	7
Sea Stone Resort Best Western	Tampa	Pinellas	0	5	5
Speckled Trout Marina	Tampa	Pinellas	9	4	13
St. Petersburg Municipal Marina	Tampa	Pinellas	0	359	359
St. Petersburg Yacht Club	Tampa	Pinellas	0	30	30
The Landings of Tarpon Springs	Tampa	Pinellas	89	0	89
Treasure Island Tennis and Yacht Club	Tampa	Pinellas	0	39	39
TAMPA BAY TOTALS	**51 MARINAS**		**1563**	**1893**	**3456**
GRAND TOTALS	**75 MARINAS**		**2242**	**3075**	**5317**

MARINAS WHERE ACCESS WAS DENIED		
MARINA NAME	**Region**	**County**
Harbour Island Marina	Tampa Bay	Hillsborough
Palm River Marina	Tampa Bay	Hillsborough
Shell Point Marina	Tampa Bay	Hillsborough
Belle Harbor Marina	Tampa Bay	Pinellas
Holiday Isle Marina	Tampa Bay	Pinellas
Home Port Marina	Tampa Bay	Pinellas
Hubbard's Passport Marina	Tampa Bay	Pinellas
Hueber Yacht Harbor	Tampa Bay	Pinellas
Indian Springs Marina	Tampa Bay	Pinellas
Madeira Beach Municipal Marina	Tampa Bay	Pinellas
Mariner's Cove Marina	Tampa Bay	Pinellas
Moorings Florida Suncoast	Tampa Bay	Pinellas
Pasadena Yacht Club	Tampa Bay	Pinellas
Pass A Grille Marina	Tampa Bay	Pinellas
Pirate's Cove Marina	Tampa Bay	Pinellas
Reddington Shores Marina	Tampa Bay	Pinellas
Tierra Verde Marina	Tampa Bay	Pinellas
Bird Key Yacht Club	Sarasota Bay	Sarasota
Bowlees Creek Marina	Sarasota Bay	Manatee

SURVEYED RAMPS			
Ramp Name	**County**	**Region**	**Total**
63rd St East	Manatee	Sarasota	98
Bishop Harbor	Manatee	Sarasota	14
Coquina Bch N	Manatee	Sarasota	143
Coquina Bch S	Manatee	Sarasota	227
Kingfish	Manatee	Sarasota	382
Palma Sola	Manatee	Sarasota	76
Riverside Park	Manatee	Sarasota	183
Warners Bayou	Manatee	Sarasota	276
Centennial Park	Sarasota	Sarasota	192
City Island Park (Ken Thompson)	Sarasota	Sarasota	142
Sarasota Bay Totals	**10 Ramps**		**1733**
Cockroach Bay	Hillsborough	Tampa	515
E.G. Simmins Park	Hillsborough	Tampa	12
Seffield Park Ruskin	Hillsborough	Tampa	5
Shell Point Marina	Hillsborough	Tampa	4
William's Park	Hillsborough	Tampa	29
Anclote River Park	Pinellas	Tampa	59
Bahia Beach Marina	Pinellas	Tampa	6
Belleair Causeway	Pinellas	Tampa	29
Blind Pass	Pinellas	Tampa	7
Courtney Campbell Causeway	Pinellas	Tampa	61
Demen's Landing	Pinellas	Tampa	8
Fort DeSoto Park	Pinellas	Tampa	238
Gandy Causeway	Pinellas	Tampa	588
Gulfport Marina	Pinellas	Tampa	19
Jungle Prada	Pinellas	Tampa	26
Maximo Park	Pinellas	Tampa	117
Pinellas Point	Pinellas	Tampa	3
Seminole Street	Pinellas	Tampa	31
War Veteran's Memorial Park	Pinellas	Tampa	162
Tampa Bay Totals	**19 Ramps**		**1919**
GRAND TOTALS	**29 RAMPS**		**3652**