

**5. CONSERVATION & COASTAL
MANAGEMENT ELEMENT**



CONSERVATION & COASTAL MANAGEMENT ELEMENT

The **Conservation & Coastal Management Element** sets the foundation for the City to protect and preserve its natural environment and coastal resources as well as protect life and property from natural disasters. This Element is broken into two goals: conservation and coastal management. The conservation objectives and policies encourage sustainability initiatives and ensure the protection of the City's natural resources such as lakes, rivers, wetlands, wildlife, shoreline, air, marine resources, native vegetation, and environmentally sensitive lands. The coastal management objectives and policies ensure the protection of the City's coastal shoreline as well as the protection of the City's residents and infrastructure from sea level rise and flooding risks. The **Conservation & Coastal Management Element** ensures the resiliency of the City and protects the quality of natural systems within the community.

CONSERVATION & COASTAL MANAGEMENT ELEMENT HIGHLIGHTS

1. Requires the protection of the City's natural resources, wildlife, and habitats and encourages restoration efforts;
2. Protects the City's native vegetation and trees as well as its air quality;
3. Protects the City's surface waters and marine resources;
4. Protects water quality through the promotion of stormwater treatment and integrated maintenance practices;
5. Protects the City's shorelines and public access to shorelines;
6. Focuses on sustainability measures including green building design, green jobs, and green infrastructure;
7. Enforces the limitation of public expenditures and avoidance of population concentrations in areas subject to destruction by flood risk and natural disasters;
8. Encourages the implementation of mitigation strategies outlined in the City's Coastal Resiliency Plan to prepare against flooding and sea level rise as well as the maintenance of the City's floodplains;
9. Establishes emergency management measures and post-disaster development strategies for the City in the face of a natural disaster;
10. Establishes the use of an Adaptation Action Area (AAA) Overlay District and a Transfer of Development Rights (TDR) program to further resiliency measures within the City;
11. Ensures development is compatible with sensitive coastal and wetland resources.



GOALS, OBJECTIVES, AND POLICIES

Goal 5-1: Protection and Conservation of Natural Resources.

Sebastian is home to a diverse collection of natural resources and habitats and as such shall conserve, protect, promote, and appropriately manage the City's natural resources in order to enhance the quality of natural systems and the sustainability of the community.

Objective 5-1.1: Protection of Wildlife and Habitats. Protect the City's natural resources, wildlife, and habitats to improve the health of the natural environment.

Policy 5-1.1.1: Protection of Natural Resources, Wildlife, and Habitats. The City's land development code (LDC) shall include:

- a. Performance criteria that protects the City's natural resources, wildlife, and habitats of endangered or threatened species from the adverse impacts of development by regulating the location, density, and intensity of those activities which cause the adverse impact.
- b. Standards which increase conservation incentives during development to further protect and preserve the City's natural resources.
- c. Provisions which recognize the rights of property owners to use their lands in a manner consistent with the rules, policies, and guidelines of the St. Johns River Water Management District (SJRWMD), Florida Fish and Wildlife Conservation Commission (FWC) and the United States Fish and Wildlife Service (USFWS).

Policy 5-1.1.2: Wildlife Protection. The City shall utilize the LDC and review processes to ensure that development projects evaluate potential environmental impacts and provide mitigation for negative impacts. Development shall not adversely impact any threatened or endangered species or species of special concern without appropriate permitting and/or mitigation.

Policy 5-1.1.3: Endangered or Threatened Species. The City shall protect threatened or endangered native species by requiring that proposed new development and redevelopment (where applicable) be examined for location of Listed Species. The City through its LDC and review processes, will:

- a. Coordinate with the County, Federal, and State agencies for the identification and protection of endangered and threatened species
- b. Require applicants to consult with the appropriate agencies, to use recognized surveying techniques to identify listed species, and to provide documentation of such coordination and compliance prior to City approval to conduct any activities that could disturb listed species or their habitat
 - If endangered species, threatened species, or species of special concern are found, such species' habitat shall be identified on the proposed site plan and a plan for mitigation shall be discussed in the site plan narrative
 - Such information shall be addressed through the project staff report
- c. Promote connectivity and minimize habitat fragmentation





Policy 5-1.1.4: Designation of Environmentally Sensitive Areas. This Element’s DIA specifically includes areas reserved for conservation uses or restricted development. All conservation land uses identified shall either remain undeveloped or shall undergo "restricted development." "Restricted development" shall be regulated through performance criteria adopted and maintained within the LDC.

Policy 5-1.1.5: Wildlife Corridors. Consistent with **Policy 5-1.9.6** and **Policy 5-1.1.6**, the City shall encourage the provision of contiguous conservation easements and preservation areas to maintain wildlife corridors and minimize the fragmentation of habitat.

Policy 5-1.1.6: Open Space Corridor System. Through the LDC and land development review process, the City shall continue to identify opportunities to:

- a. Provide an interconnected open space corridor system that links existing open spaces, greenways, public right of ways, and trails including new open space corridors
- b. Provide connections from adjacent development to existing or planned open space corridors
- c. Connect parks and civic resources (i.e., Community Center)
- d. Provide low-impact natural activities such as walking trails, benches, picnic areas, and canoe/kayak launches
- e. Connect the City and County’s open space corridors
- f. Require that open space corridors minimize the fragmentation of significant wildlife habitat. Corridor widths shall be defined based on the natural range of targeted habitat/species; however, are generally considered to be a minimum of 25 feet in width

Policy 5-1.1.7: Open Space Crossings. The City shall consider road construction, reconstruction or other similar improvements encroaching or crossing an open space corridor, encourage crossing design features, and consider alternative roadway design standards. Crossings shall be designed in accordance with the recommendations of the Florida Fish and Wildlife Conservation Commission.

Policy 5-1.1.8: Native Habitats Inventory and Assessment. The City will update its inventory and assess significant native habitat remaining within the City limits. The City will also require development and redevelopment to determine the existence of any significant native habitats and such information will be added to the inventory.

Policy 5-1.1.9: Restoration Efforts. The City shall encourage the restoration of degraded sensitive habitat in order to reestablish natural diversity and encourage connectivity of vital habitats.

Policy 5-1.1.10: Open Space. The City’s LDC shall include an open space requirement which:

- a. As density of development increases, the percentage of open space shall increase as well; and
- b. Open space shall be limited to a certain percentage of the stormwater retention area to ensure that native habitat is being conserved.

Policy 5-1.1.11: Protection of Vegetative Communities. The City’s LDC, including the adopted Tree Protection and Landscaping Regulations, shall be used in managing and protecting the impacts of development on major vegetative communities. These regulations shall mandate restoration in order to compensate for unauthorized removal of vegetation and to enhance stabilization of fragile slopes and/or shorelines impacted by development.

Policy 5-1.1.12: Protection of Native Habitats. The City shall limit the disturbance of and protect significant native habitats through its LDC and review process including the following:

- a. Preserve existing native vegetation and natural areas including threatened native habitats;





- b. Encourage development forms that provide protection of significant native habitats such as clustered development and alternative roadway designs (i.e., reduced rights-of-way);
- c. Development shall first avoid impact to significant native habitats;
- d. Mitigate adverse impacts whenever areas of native habitats are involved in the development of property;
- e. Require development to first impact lower quality habitats and resources before impacts to higher quality habitats and resources are considered and used;
- f. Native habitat shall be used whenever possible to fulfill open space requirements; and
- g. Protect environmentally sensitive/significant areas (i.e., floodplain, watersheds, water recharge areas, etc.).

Policy 5-1.1.13: Preservation of Native Vegetative Communities. The City's LDC shall include an open space requirement and mandate that new development set aside a minimum 25% of each native vegetative community including trees as identified in **Policy 5-1.1.11**. The ordinance shall provide incentives for increased conservation of native vegetative communities determined to be regionally rare or endangered. The City may require payment of a fee in lieu of or participation in a tree bank (as may be adopted by the City) for the described mandatory "set aside" of habitat. Such cash payment may be in the form of an impact fee in lieu of habitat preservation to be accumulated from development for the purchase of upland habitat preservation off-site rather than on-site. Other adjustments may only be granted where compensatory mitigation is provided through revegetation with native vegetative species compatible with existing vegetative communities.

Policy 5-1.1.14: Florida Friendly Landscaping. The City shall encourage the use of Florida Friendly landscaping which uses low-maintenance plants and environmentally sustainable practices.

Policy 5-1.1.15: Removal of Undesirable Exotic Vegetation. The LDC shall require that, prior to the issuance of a certificate of occupancy for a new development; the owner/applicant shall remove all nuisance and invasive exotic vegetation as defined by the Florida Exotic Pest Plant Council (FLEPPC) on the subject property.

Policy 5-1.1.16: Invasive Exotic Vegetation and Wildlife. The City should help prevent the spread of non-native invasive exotic vegetation and wildlife and protect the health and well-being of the native environment through:

- a. Removal of existing invasive exotic species in coordination with City initiated work projects and replacement with native Florida plant species;
- b. Prohibition of the use of invasive exotic species;
- c. Public awareness about the harmful impacts of non-native species into the environment; and
- d. Regional, state, and federal partnerships on efforts to eradicate invasive exotic species

Policy 5-1.1.17: Tree Protection. The City shall continue to maintain the Tree Protection and Landscaping Ordinance within the LDC to address, at a minimum, tree protection and removal standards, historic trees, mangroves, undesirable exotic vegetation, suitable trees for planting, and residential/commercial development tree requirements.

Policy 5-1.1.18: Urban Tree Canopy. The City shall focus on preserving and promoting its urban tree canopy and consider the addition and enhancement of trees and landscaping within specific public



rights-of-way and other public areas. The City shall maintain their Tree City USA designation through the Arbor Day Foundation.

Objective 5-1.2: Protection of Surface Waters. Implement policies that limit adverse impacts or alterations to surface waters to the greatest extent possible.

Policy 5-1.2.1: Protect the City's Natural Lakes and Rivers. The City's LDC shall include performance criteria designed to regulate against land development activities which adversely impact water quality, contribute to shoreline erosion and sedimentation, or otherwise threaten the long-term existence of the City's surface waters.

Policy 5-1.2.2: Required Dedication of Conservation Easements or Reservations. The City shall maintain regulations that provide for the dedication of conservation easements or reservations where the City finds that the dedication is reasonable in order to protect the value and function of a wetland or other surface water.

Policy 5-1.2.3: Wetland Protection. Wetlands shall be defined as set by 373.421 F.S. and 373.019(27) F.S. and shall be protected from physical or hydrologic alterations in order to maintain natural functions. The City shall maintain LDC performance standards designed to protect, conserve, and enhance wetlands by directing incompatible land uses away from wetlands. The LDC shall also prohibit any development within the wetland shoreline or adjacent buffer area, with the exception of water dependent native shoreline vegetation programs, approved pervious or elevated accessways, or other uses approved by the City pursuant to other City regulations.

Policy 5-1.2.4: Establishing the Wetland Line. No non-water dependent uses shall be permitted on submerged lands or wetlands. The LDC shall include a requirement that any development conduct a delineation of the landward extent of wetlands and other surface waters. The landward extent of wetlands and other surface waters shall be field delineated and flagged by a professional biologist provided by the applicant and formally approved by the SJRWMD, the Florida Department of Environmental Protection (FDEP), and/or the US Army Corps of Engineers (USACE). The approved line shall be delineated on the site plan.

Policy 5-1.2.5: Wetland Transition Area: Development on uplands adjacent to wetlands shall preserve a wetland transition area which will act as a buffer between wetlands and upland development or other land alteration activities. The LDC shall require this buffer to be in accordance to the minimum standards set by SJRWMD. The specific boundary of a wetland transition area shall be established by field investigation and must be indicated on site plans for development. The purpose of the transition area is to ensure the continuing function of respective wetland communities.

Policy 5-1.2.6: Administration of Wetland Development Restrictions. The City shall coordinate with state and federal regulatory agencies in regard to the development rights to be permitted on wetlands and/or lands under the jurisdiction of the state or federal government. The developer of the parcel of environmentally sensitive land shall be responsible for obtaining permits or exemptions from SJRWMD, FDEP, and the USACE, as may be appropriate, prior to obtaining a development order or development plan review approval from the City. Regardless of permitting by Federal or State permitting agencies, the City shall reserve the right to determine the appropriate land use, density/intensity, and special mitigation measures including, but not limited to, the construction of culverts or other means.



Policy 5-1.2.7: Development Requirements. The City's LDC shall include standards that require that the applicant shall bear the burden of proof in determining that development shall not adversely impact wetlands, transitional wetlands, and other environmentally fragile natural systems. The applicant shall prove that the type, value, function, size, and condition of the wetland will not be adversely impacted, such determinations shall be based on physical and biological data obtained from specific site investigations by a biologist, an engineer or by another professional competent in producing data and analysis necessary to support impact assessments. Applicants shall have an opportunity to demonstrate that any wetland designations within the confines of their property no longer function as wetlands.

Objective 5-1.3: Protection of Marine Resources. Protect and appropriately manage the City's marine resources and living marine organisms.

Policy 5-1.3.1: Protect Living Marine Resources, Coastal Marsh, Estuarine Water Quality, and Seagrass Beds. The City shall maintain the LDC to include performance criteria which shall regulate against adverse impacts of development on estuarine areas such as living marine organisms, seagrass, coastal marsh, and mangroves. The LDC shall require that plans for development impacting marine resources be coordinated with state agencies having jurisdiction. The applicant shall bear the burden of demonstrating that potential adverse impacts on estuarine resources have been or shall be prevented. The review process for all proposed development that fronts on Indian River Drive shall involve all local, state, and regional entities with regulatory authority. Impacts to be considered shall include the following but not be restricted to:

- a. Prevent estuarine pollution;
- b. Control surface water run off;
- c. Reduce exposure to natural hazards;
- d. Protect seagrasses and other living marine resources;
- e. Ensure adequate public access; and
- f. Ensure adequate sites and standards for regulating water-dependent and water-related uses.

Policy 5-1.3.2: Manage Impact of Coastal Development on Tidal Flushing and Circulation Patterns. The City's LDC shall include standards that require that tidal flushing and circulation patterns shall not be altered by development activities. No development shall produce changes in the tidal flushing and circulation patterns unless the City and other public agencies having jurisdiction have granted requisite permits. No such permit shall be granted by the City unless all other agencies having jurisdiction have granted clearance and the applicant has submitted hydrographic information sufficient to clearly demonstrate that no adverse environmental impacts shall be occasioned by the proposed changes in tidal flushing and circulation patterns. No alteration in tidal flow shall be permitted which causes stagnation or siltation.

Policy 5-1.3.3: Protection of Manatee Habitat. The City shall promote protection of manatees and manatee habitat in a manner consistent with applicable state guidelines and Indian River County's Manatee Protection and Boating Safety Comprehensive Management Plan (August 2004).

Policy 5-1.3.4: Conservation Easements. The City shall work with private property owners to implement conservation easements to protect sensitive natural resources such as mangroves, dune systems, and coastal tidal areas.

Objective 5-1.4: Improve Water Quality and Quantity. Maintain policies and regulations to protect and improve the City's water quality and quantity.



Policy 5-1.4.1: Water Quality. Water run-off and introduction of nutrients shall be regulated through effective water quality management criteria. In order to protect the water quality of the Aquatic Preserve, no new point source pollution shall be permitted to discharge into the lagoon or into ditches or canals flowing into the lagoon. In addition, in order to reduce non-point source pollutants, the LDC shall comply with FDEP, SJRWMD, and the Indian River Lagoon Comprehensive Conservation and Management Plan.

Policy 5-1.4.2: Requirements. In order to protect water quality the City's LDC shall require the following for new development or redevelopment:

- a. The use of Low Impact Development (LID) strategies and best management practices shall be encouraged including as part of the stormwater fee credit program;
- b. Erosion control consistent with **Objective 5-1.7** and its related policy;
- c. Surface water management systems shall be designed and constructed to retain or detain with filtration, as a minimum the storm water run-off generated from the first one-inch of rainfall over the entire site;
- d. Landscaped buffer areas shall be required in accordance with the minimum buffer requirements established by SJRWMD;
- e. A vegetated and functional littoral zone shall be established on water bodies created as part of the surface water management system on all new developments. Littoral zone plantings shall be established in commercial and residential subdivision permitted stormwater ponds. Prior to construction of the surface water management system for any phase of a project, the developer shall prepare a design and management plan for the wetland/littoral zone that will be created as part of these systems;
- f. Require sewage pump-out facilities at all marinas and for facilities which sell petroleum products require adequate fuel spill containment facilities measures; and
- g. All new development shall be required to connect to the Indian River County Utilities wastewater system when available as defined by FS 381.0065, and in accordance with the City's LDC's.

Policy 5-1.4.3: Class II Waters. Class II Waters (i.e., coastal waterbodies which currently do or have potential for supporting shellfish harvesting) shall be protected by incorporating and maintaining the following provisions in the City's LDC:

- a. Dredging activities shall be limited to approved maintenance dredging and shall minimize adverse impacts on shellfish propagation or harvesting. The City shall require that fill and dredging activities comply with all applicable local, state, and federal permitting requirements;
- b. Ensure good water quality by coordinating with the FDEP and the SJRWMD in monitoring the quality of storm water run-off. The City's LDC shall provide performance criteria designed to ensure that new development provides effective and adequate storm-water management improvements concurrent with the impacts of new development;
- c. Continue to assess needs for retrofitting stormwater outfalls without adequate treatment;
- d. Limit the use of Class II waters to water dependent activities that are not contrary to the public interest and satisfy a community need; and
- e. Limit modification of grass beds only to those cases involving overriding public interest.

Policy 5-1.4.4: Regulate Agricultural Activities to Preserve Water Quality. The City's LDC shall include stipulations requiring that agricultural activities shall:

- a. Not be conducted adjacent to existing waterways and surface water management activities and shall comply with all applicable policies of FDEP, SJRWMD, and other agencies having



appropriate jurisdiction as well as State laws, including administrative rules governing the Indian River Lagoon Aquatic Preserve. Such activities shall not threaten the water quality of the City's rivers and waterbodies;

- b. Maintain natural drainage patterns;
- c. Promote the use of surface water supplies for irrigation purposes;
- d. Prohibit the expansion of agricultural activities into wetland areas; and
- e. Use best management principles and practices in order to reduce pesticide and fertilizer run-off, prevent soil erosion, and preserve water quality.

Policy 5-1.4.5: Protect Deep Aquifer Water Resources. In order to protect the quality and quantity of deep aquifer water resources, the City shall coordinate with SJRWMD and other applicable regulatory agencies in identifying the existence and location of free flowing deep aquifer wells and in requiring corrective measures, including capping, plugging, or installing regulatory devices which control the discharge of water from the deep aquifer pursuant to the SJRWMD policies.

Policy 5-1.4.6: Surficial Aquifer Recharge Area Protection. The City shall protect surficial aquifer recharge areas from impacts that would significantly alter their ability to function. The City's LDC shall include standards that restrict development within surficial aquifer recharge areas and that require retention of open space for all development in order to:

- a. Preserve the quality and quantity of water resources within the surficial aquifer;
- b. Promote improved surface water management; and
- c. Create natural or landscaped urban green space for enhanced community aesthetics and passive pedestrian activities.

Policy 5-1.4.7: Protection and Conservation of Potable Water Supply. The City shall continue to require the LDC to incorporate performance criteria for public potable water wellfield protection. In addition, administrative procedures shall require applicants for development to coordinate with the SJRWMD in obtaining consumptive use permits. In order to comply with potable water conservation policies of the SJRWMD and achieve a reduction in the current rates of water consumption, the City's LDC shall incorporate the following performance standards:

- a. Where reclaimed water is available, potable water supplies may not be used to meet irrigation needs;
- b. Encourage the use of water-saving plumbing fixtures on all new development; and
- c. In order to reduce demand for irrigation water (which in turn often places greater demand upon potable water sources), Florida Friendly landscaping

Policy 5-1.4.8: Emergency Conservation of Water Sources. The City shall coordinate with the SJRWMD in implementing emergency water conservation measures based on the SJRWMD plans for management of the region's water resources.

Policy 5-1.4.9: Managing Land Use Surrounding Water Well Cones of Influence. The City's LDC shall contain performance criteria designed to protect potable water supply and quality by restricting land development within public water well cones of influence in order to avoid potential adverse impacts on potable water resources.

Policy 5-1.4.10: Resiliency. The City is susceptible to impacts of future sea level rise and combined rain events that would cause flooding based on data outlined in the City's Coastal Resiliency Plan. Best management practices to address flooding level of service violations and water quality shall be devised and, given the hydrology of the area, it is encouraged that there be the development of a





pollutant load model. It is also encouraged that there be the hardening of pump-stations in order to increase resiliency against flooding events.

Policy 5-1.4.11: Stormwater Management. Consistent with **Policy 4-1.4.2** of the **Infrastructure Element**, the City shall pursue the development of an update to the 2013 Stormwater Management Master Plan. The plan shall provide a basis for adopting regulatory measures for enhancing water quality and shall identify capital improvements needed to improve the storm water management system.

Policy 5-1.4.12: Illicit Discharge. Consistent with the Florida Department of Environmental Protection (FDEP) National Pollutant Discharge Elimination System (NPDES) generic permit requirements for regulated municipal separate stormwater systems (MS4), the City shall implement a stormwater management program to reduce the contamination of stormwater runoff and prohibit and eliminate illicit discharges to the MS4. The City's regulations related to illicit discharge detection and elimination will be informed by the Best Management Practices as established by FDEP. The City shall also continue to follow the regulatory requirements for the NPDES MS4 permit, as set forth in Chapter 62-624, F.A.C.

Policy 5-1.4.13: Septic to Sewer Conversion. Consistent with **Policy 4-1.2.3** of the **Infrastructure Element**, the conversion of septic tanks to centralized sewer services is critical, considering the location of existing septic tanks within environmentally sensitive areas and areas vulnerable to the impacts of flooding and sea level rise. The City shall continue to support the implementation of the Sebastian CRA Septic to Sewer Conversion Program and Indian River County initiatives to expand sanitary sewer service within the City such as the North Sebastian Septic to Sewer Phase I Conversion Project.

Policy 5-1.4.14: Total Maximum Daily Loads (TMDLs). The City shall continue to support the Basin Management Action Plan (BMAP) for the Central Indian River Lagoon in meeting the Florida Department of Environmental Protection (FDEP) adopted nutrient total maximum daily loads (TMDLs) for the main stem of the Indian River Lagoon Basin.

Objective 5-1.5: Protect Air Quality. Protect and improve air quality by ensuring development meets or exceeds state and federal air quality standards and establishing regulatory programs to prevent and/or minimize non-point and ambient sources of air pollution.

Policy 5-1.5.1: Combat Erosion and Generation of Dust Particles. The City's LDC shall incorporate performance standards which combat erosion and generation of fugitive dust particles. The regulations shall require that measures be taken on building sites or cleared areas which assure that exposed, destabilized, or other altered soil is expeditiously covered with an acceptable erosion control material.

Policy 5-1.5.2: Air Pollution and Land Use Regulations. The City's LDC, including adopted soil erosion and sedimentation controls as well as nuisance abatement standards, shall continue to protect against loss of air quality by maintaining land use controls which promote only activities compatible with existing land uses and natural systems and prohibit activities which generate air pollutants and other adverse impacts on the environmentally fragile coastal ecosystem. The City shall also promote the function of trees in improving air quality through the Tree Protection and Landscaping Ordinance, consistent with **Objective 5-1.9**.

Policy 5-1.5.3: Land Use and Transportation. Consistent with the **Land Use Element** and **Transportation & Mobility Element**, the City shall promote the reduction of vehicle emission by



supporting land uses that promote walking, biking, transit, and alternative modes of transportation, and encourage urban infill development that limits the need for automobile use, increases trip capture, and reduces traffic congestion in a cost-effective manner.

Objective 5-1.6: Protection of Shoreline and Public Access to Shoreline. Protect and preserve the City's shorelines and public access to water based facilities and natural resources. Promote post-development shoreline stabilization methods that mimic a natural shoreline and support native habitat.

Policy 5-1.6.1: Public Access to Waterfront Areas. The City shall encourage developers to provide public waterfront access adjacent to the waterfront. Such access may include walkways, bikeways, water taxis, canoeing/kayaking, public spaces, dining areas, and the like.

Policy 5-1.6.2: Florida Native Vegetation and Features. The City shall require the use of native Florida vegetation and protection of natural features in coastal and waterfront development.

Policy 5-1.6.3: Public Access to Indian River Lagoon. The City's LDC shall require shoreline access to the Indian River Lagoon to be promoted in order to maintain accessways along the shoreline. State assistance shall be enlisted to achieve land required to appropriately store vehicles, provide rest room facilities, and accessways designed in a manner compatible with the shoreline ecosystem.

Policy 5-1.6.4: Waterfront Planning. The City's LDC shall include criteria for regulating water-dependent and water-related shoreline land uses. No structures which constrict water circulation in all flowing surface waters shall be permitted.

Policy 5-1.6.5: Shorelines and Submerged Lands Planning. The City's LDC shall require all applicants proposing development activities along the City's shorelines or within submerged areas to submit a site plan which demonstrate how the development shall incorporate features designed to protect against potential adverse impacts to shoreline vegetation and stabilization, water quality, native habitat, and shoreline access. The City shall require surveys of existing conditions, specifications of planned site improvements, and the techniques to be used in constructing, operating, and maintaining the land use. No shoreline development permit or development order shall be approved until the applicant has demonstrated that potentially adverse impacts shall be prevented or that compensatory mitigation shall occur.

Policy 5-1.6.6: Prioritizing Shoreline Uses and Public Shoreline Access. The City's LDC shall include the following criteria for prioritizing shoreline uses and public shoreline access:

- a. In reviewing applications for shoreline development First Priority shall be directed to non-structural shoreline protection uses (ex: native shoreline revegetation programs) and approved water-dependent shoreline uses (ex: pervious accessways, duly permitted dock facilities, and commercial marinas). Priority shall be directed to water dependent uses which are available for public use.
- b. In reviewing applications for shoreline development Second Priority shall be directed to water-related uses such as parking facilities for shoreline access, residential structures which comply with the building code for structures within the State coastal building zone, and recreational facilities which comply with applicable codes.

Policy 5-1.6.7: Water Dependent Shoreline Uses. The City shall require that water dependent shoreline uses obtain requisite permits from all environmental permitting agencies prior to obtaining



City approval. Docks or marina improvements shall not be approved by the City until the applicant demonstrates compliance with all applicable federal and state laws and administrative rules governing Aquatic Preserves as well as applicable policies of regional agencies. The City's LDC shall require site plans for all docks and marinas and no commercial marina facilities shall be permitted on the St. Sebastian River. Site plans must demonstrate to the City's satisfaction that the facilities shall not adversely impact natural marine resources.

Policy 5-1.6.8: Water Related Shoreline Uses. The City's LDC shall require that all water-related uses be built on uplands landward of the floodway. Within the state coastal building zone all construction activities shall be predicated on plans compliant with applicable state and local building codes. Dredging and filling of wetlands or open water in order to accommodate water-related uses shall not be permitted unless the City approves such activity pursuant to provisions of the wetland protection ordinance, the storm water management ordinance, and all other relevant site plan review criteria.

Policy 5-1.6.9: Hardening of the Shoreline. Hardening of the shoreline with rip-rap, bulkheads or other similar devices shall not be allowed unless erosion constitutes a critical peril to upland property and the use of vegetation has failed to stabilize the shoreline. The City's LDC shall include design specifications of any shoreline hardening structure. Such shoreline hardening structures shall generally not be vertical seawalls or bulkheads. The specific location and design of such structures shall be approved by the City as well as by other public entities having jurisdiction in the matter. The LDC shall require an environmental impact study and a special City Council variance for any sea wall construction. The City shall require the compliance with state and federal permitting requirements in the removal and/or modification of protected shoreline vegetation.

Policy 5-1.6.10: Protect, Stabilize, and Enhance the Shoreline. The City shall promote natural shoreline systems by utilizing the site and development process to promote the installation of native vegetation and living shorelines and the removal of existing hardening structures. The City's LDC shall stipulate that no native vegetation shall be removed from the shoreline without a duly authorized City land clearing permit. Similarly, criteria shall be included in the LDC which requires an applicant for development along the shoreline to be required to revegetate, stabilize, and enhance damaged shorelines by planting native vegetation.

Objective 5-1.7: Minimize Soil Erosion. Reduce the incidence of soil erosion caused by land clearing, breaches in stabilized shorelines, and lands having exposed soil without vegetative cover.

Policy 5-1.7.1: Implementing Erosion Control. The City's LDC shall require that appropriate measures be taken during land clearing and building operations to ensure that exposed, destabilized or otherwise altered soil is expeditiously covered with an acceptable erosion control material. The City's LDC shall require compliance with regulatory requirements and the City's NPDES MS4 permit, including consistency with **Policy 5-1.4.2**. The City's regulations related to soil erosion will be informed by the Best Management Practices as established by SJRWMD, FDEP, FDOT, Florida Cooperative Extension Service, Florida Department of Agriculture and Consumer Services, Institute of Food and Agricultural Sciences, and Natural Resources Conservation Service.

Objective 5-1.8: Mining and Mineral Excavation Activities. Prevent the adverse effects of the extraction of mineral resources within the City.

Policy 5-1.8.1: Prohibition Against Mining Activities. The LDC shall prohibit mining activities, except for existing sand mining operations, to protect the City's ecosystems.



Objective 5-1.9: Green Infrastructure and Sustainability. Consider sustainability and environmental-consciousness in the City's operations and promote the utilization of green infrastructure.

Policy 5-1.9.1: Sustainability. The City shall support the Sustainable Sebastian Initiative and Resolution in order to promote sustainability principles and encourage adaptation strategies.

Policy 5-1.9.2: Sustainability Action Plan. The City shall consider the development of a Sustainability Action Plan to include long-term objectives and short-term actions to guide the City in areas including, but not limited to, improving quality of life and community/individual health; energy conservation/independence; air quality, water quality, and natural systems; and economic sustainability.

Policy 5-1.9.3: Green Jobs. Consistent with the **Economic Development Element**, the City shall explore strategies to leverage the City's natural and economic assets to attract 'green jobs' and related nature based industries.

Policy 5-1.9.4: Integrated Pest Management Plan. The City shall implement its 2020 Integrated Pest Management Plan in order to promote the most sustainable pest management methods which aim to minimize risks to human and environmental health through the limited use of chemicals, while also remaining economically feasible.

Policy 5-1.9.5: Green Building Design. Consistent with **Policy 1-2.3.4** of the **Land Use Element** the City shall encourage energy conservation in building and construction. The City shall encourage green building design (i.e. LEED) which promotes energy and resource efficiency, waste reduction, pollution prevention, respects natural topography, and improves occupant health and productivity.

Policy 5-1.9.6: Green Infrastructure. Green infrastructure provides for wildlife habitat, stormwater management, and recreational opportunities. The City shall plan for and manage its green infrastructure including its parks, greenways, and protected conservation lands. The City shall also coordinate local open space plans with regional green infrastructure plans in order to promote connectivity, investment, and maximize the ecological and public benefits of green infrastructure.

Goal 5-2: Coastal Management and Resiliency. The coastal community of Sebastian shall limit public expenditures in areas subject to destruction by flood risk and natural disasters.

Objective 5-2.1: Coastal High-Hazard Area. The Coastal High Hazard Area (CHHA) is an area particularly vulnerable to the effects of coastal flooding from tropical storm events and is defined by section 163.3178(2)(h)9, Florida Statutes, as the area below the elevation of the category 1 storm surge line as established by a Sea, Lake, and Overland Surges from Hurricanes (SLOSH) computerized storm surge model (See **Map 5-7**). The City shall enforce development restrictions within the CHHA and any area found to have historically experienced destruction or severe damage from storm driven, wind, water, or erosion. The City has identified the high velocity storm surge area as indicated on the Federal flood insurance rate maps as the only such area.

5-2.1.1: Coastal High Hazard Area Application: The following shall apply for purposes of evaluating applications for development within the City, specifically comprehensive plan land use amendments, map and text, and rezoning:

- a. If 50 percent or more of a parcel of land is located within the Coastal High Hazard Area, then the entire parcel shall be considered within the Coastal High Hazard Area



- b. Isolated areas that are defined by the SLOSH computerized storm surge model to be at higher elevations, and are surrounded by the CHHA or by the CHHA and a body of water, shall be considered within the CHHA
- c. For purposes of evaluating development proposals or site plans, if any portion of the proposed building footprint is in the CHHA, then the entire parcel shall be considered within the CHHA

Policy 5-2.1.2: Limiting Public Subsidy of Development in the Coastal High-Hazard Area. The City shall limit public expenditures that subsidize development permitted in the CHHA to restoration or enhancement of natural resources and public services for water dependent uses. The only exception to this regulation shall be that existing mobile homes within the CHHA shall be grandfathered in, thereby may be repaired and/or replaced as long as the density does not increase. The City shall aim to minimize the impact of natural hazards such as flooding and sea level rise to the community by directing development away from the CHHA as defined by State Statute §163.3178(2)(f), F.S. This policy shall not be interpreted as prohibiting the extension of sewer lines to replace failed septic tank systems identified in **Policy 5-2.1.2** and **Policy 5-2.1.3** below.

Policy 5-2.1.3: CHHA Infrastructure. Consistent with **Policy 4-1.2.3** of the **Infrastructure Element**, the City shall support septic to sewer efforts in order to preserve environmental integrity and protect the health of residents. Enhanced septic systems which include additional treatments may be allowed in the CHHA for areas not serviced by wastewater facilities.

Policy 5-2.1.4 Infrastructure Extensions: The City shall encourage the extension of wastewater facilities to replace failing septic tank systems in areas subject to flooding as a means to protect ground water quality.

Policy 5-2.1.5: Existing Infrastructure in the CHHA. The City shall establish a priority list of infrastructure facilities located in the CHHA which could be relocated, mitigated or replaced should state funding become available for such activities. Additional infrastructure and assets are inventoried in the City’s Coastal Resiliency Plan.

Policy 5-2.1.6: Public Investments in CHHA. Except as provided in Policies above, publicly funded facilities shall not be built in the CHHA, unless the facility is for public access, resource restoration, adequate evacuation, or service to water dependent activities. These facilities may face inundation and be impacted if they are outdoor facilities according to the City’s Coastal Resiliency Plan. **The City is encouraged** to consider a funding source for purchasing CHHA properties and creating low impact/ low risk re-use of the property.

Policy 5-2.1.7: Hazard Mitigation and CHHA. The City shall maintain LDC’s which contain performance standards regulating development activities in a manner which minimizes the danger to life and property occasioned by natural hazard events including:

- a. Non-residential construction within the CHHA shall meet storm and floodproofing standards exceeding those required for a one hundred (100) year storm; and
- b. If a structure located within the CHHA receive storm damage in excess of fifty (50) percent of its physical size, all such damaged structures shall be required to meet all current laws and ordinances, including those enacted since construction of the subject structure.

Policy 5-2.1.8: Avoid Population Concentrations in CHHA. The City shall restrict development and not increase or support densities or intensities beyond those depicted on the Future Land Use Map in





the CHHA in order to minimize danger to life and property caused by hurricane events, flooding, or sea level rise. The City shall direct population concentrations away from CHHA.

Policy 5-2.1.9: Restrict Development in CHHA. The City shall incorporate policies in the LDC in order to direct population concentrations away from known or predicted areas in the CHHA. Also, the City shall direct population concentrations away from known areas that are vulnerable to flooding inundation and sea level rise as established in the City’s Coastal Resiliency Plan. Development principles and strategies that eliminate unsafe development in the CHHA must be used as defined by §163.3178(2)(f), F.S. The following provisions shall restrict development within the CHHA:

- a. Water and sewer treatment plants, industrial holding ponds and other potential point pollution sources within the coastal high-hazard area are prohibited;
- b. Require construction within the hurricane flood zone to meet storm and flood proofing standards exceeding those required for a 100-year storm; and
- c. Residential development and/or redevelopment in the CHHA shall not exceed existing residential densities for that property.

Objective 5-2.2: Maintenance of Floodplain. Protect the natural functions, including flood- carrying and flood storage capacity, of the 100-year floodplain.

Policy 5-2.2.1: Enforce Policies to Maintain Floodplain. The City shall continue to enforce its surface water management and flood damage prevention regulations including the following:

- a. New development encroaching into the floodplain shall incorporate flood protection measures sufficient to protect against the 100-year flood. New development encroaching into areas subject to sea level rise, storm surge, and flood inundation shall incorporate flood protection measures as defined in the City’s Coastal Resiliency Plan.
- b. The City’s Storm Water Management and Flood Protection Ordinance shall maintain consistency with program policies of the Federal Insurance Administration including the National Flood Insurance Program (NFIP) Community Rating System (CRS). The City shall monitor new cost-effective programs for minimizing flood damage. Such programs may include compensatory storage for loss of floodplain or modification to construction setback requirements, or other site design techniques, as well as upgraded building and construction techniques.
- c. The City shall encourage the use of best management practices for development strategies that result in reducing flood risk and the removal of coastal real property from flood zone designations established by the Federal Emergency Agency as required by §163.3178(2)(f), F.S.

Policy 5-2.2.2: Purchase of Floodplain. The City shall identify and recommend to the State and FDEP purchase of floodplains that would comply with program guidelines established under the Florida Forever Program.

Objective 5-2.3. Emergency Management. Ensure City preparedness in the case of a natural disaster or emergency.

Policy 5-2.3.1 Emergency Preparedness: Consistent with **Objective 1-2.5** of the **Land Use Element** and **Policies 4-1.1.10 and 4-1.1.11** of the **Infrastructure Element**, the City shall include emergency management criteria into the LDC to mitigate the impacts of natural disasters or emergency





events, including fires, pandemics/epidemics, terrorism and other disasters in order to protect public health and safety.

Policy 5-2.3.2: Hurricane Evacuation. The City shall coordinate with Indian River County in attaining a hurricane evacuation time of less than twelve (12) hours. There is the potential to put into place early warning notifications for elderly residents who are potentially more vulnerable as recommended in the City's Coastal Resiliency Plan. According to the Coastal Resiliency Plan, inundation caused by flooding and sea level rise is predicted to impact evacuation routes on Sebastian Boulevard and this vulnerability should be addressed to increase resilience.

Policy 5-2.3.3: Removal of Trees Causing Safety Hazard. The City's LDC shall require that trees, such as Australian Pines, that are prone to wind damage and blockage of evacuation routes be removed from areas deemed by the City to be critical corridors for evacuation purposes. In addition, the City shall consider the feasibility of imitating a similar program to remove any trees on public property which impose a critical threat to evacuation routes.

Policy 5-2.3.4: Hurricane Evacuation Logistical Support. In order to prevent unnecessary evacuees crowding roads and shelters, the City shall coordinate with Indian River County in disseminating information concerning the need of residents to evacuate at various hurricane threat levels, flood events, and sea level rise events. The City shall coordinate with the County and the Indian River County Emergency Management Director in assisting the implementation of the County's campaign to educate the general citizenry regarding emergency preparedness plans, including specific citizen directives.

Policy 5-2.3.5: Future Coordination with the County in Emergency Preparedness. In order to provide for safe and efficient evacuation of the residents of the City of Sebastian and other communities in the event of a hurricane or other disaster,

- a. The City shall enforce its Emergency Management Plan and continue to coordinate with Indian River County in annual updates of the County's Comprehensive Emergency Management Plan addressing future populations and responses (response times, evacuation times, shelter capacity, etc).
- b. The City's LDC shall mandate that new development maintain a density threshold which is consistent with the County's Comprehensive Emergency Management Plan. This stipulation will assure that future density thresholds may be accommodated without adversely impacting hurricane evacuation time. The City shall also coordinate with the County in updating hurricane evacuation shelter assignments as well as other policy formulation surrounding land use and emergency preparedness.

Policy 5-2.3.6: Coordinate Update of the Hazard Mitigation Plan. The City shall coordinate with the County in updating the hazard mitigation component of the County's Comprehensive Emergency Management Plan pursuant to the five (5) year interval schedule adopted by the County. Updates of the Plan shall identify specific actions that may be implemented to reduce exposure to natural hazards, include strategies for post-disaster recovery operations, and incorporate interagency hazard mitigation reports as such reports are generated in the future. The City shall also maintain, update, and enforce the City of Sebastian's Emergency Management Plan to ensure preparedness in the case of a natural disaster.



Objective 5-2.4: Post-disaster Redevelopment. Coordinate with Indian River County in providing immediate response to post-disaster situations.

Policy 5-2.4.1: Post-Hurricane Assessments. The City Council shall appoint a Recovery Task Force (RTF) comprised of the City Manager, the Building Official, and others as determined by the City Council. The RTF shall be responsible for assessing the conditions following a hurricane or other similar disasters such as flooding events and shall propose strategic actions necessary to establish order and re-establish communication and basic service delivery systems necessary for health, safety, and welfare. Within ninety (90) days after appointment of the Recovery Task Force, the Task Force shall meet to determine a management framework for resolving issues confronted in times of a natural disaster. The management framework shall be reviewed with the County Civil Defense Officer for compliance with the County's Comprehensive Emergency Management Plan and shall be presented to the City Council for review and approval. The management plan should provide a basis for executing the following activities during times of natural disaster:

- a. Establishing a temporary moratorium on building activity;
- b. Reviewing and deciding upon emergency building permits;
- c. Coordinating with State and Federal officials to prepare disaster assistance applications;
- d. Analyzing and recommending to the City Council hazard mitigation options, including reconstruction or relocation of damaged public facilities;
- e. Developing a redevelopment plan including limitations on redevelopment in areas of repeated damage; and
- f. Recommending amendments to the Local Peacetime Emergency Plan and other appropriate policies and procedures.

Policy 5-2.4.2: Repair and Clean-up. In planning post-disaster redevelopment activities, factors to be considered in order to protect the public health and safety shall include:

- a. Repairs to potable water, wastewater and power facilities;
- b. Removal of debris;
- c. Stabilization or removal of structures in a perilous condition; and
- d. Minimal repairs to make structures habitable.

These considerations shall receive first priority in determining the appropriateness of emergency building permits. Long term redevelopment activities shall be postponed until the Recovery Task Force has coordinated immediate repair and clean-up operations.

Policy 5-2.4.3: Redevelopment Activities. The LDC shall require the redevelopment of any structure within the City that received storm-damage in excess of fifty (50%) percent of its appraised value to meet all current laws and ordinances, including those enacted since construction of the subject structure. The city shall require that new development and redevelopment in areas that are at high risk of flooding to use best practices, strategies, and engineering solutions that may reduce risk and losses due to storms, flooding and sea level rise as defined by §163.3178(2)(f), F.S.

Policy 5-2.4.4: Establish Public Facilities Review Committee. The City Council shall designate the Recovery Taskforce as the City's designated Public Facilities Review Committee charged with the responsibility for reviewing available alternatives for managing damaged public facilities following a hurricane event. The Committee shall evaluate future options for such facilities, including, but not limited to, abandonment repair in place, relocation, and reconstruction, with



structural modifications. The Committee shall consider these options based on the following considerations:

- a. Cost to construct;
- b. Impacts on the environment;
- c. Cost to maintain;
- d. Public sector;
- e. Recurring damages;
- f. Impacts on land use; and
- g. Other relevant factors.

Objective 5-2.5: Establish an Adaptation Action Area Overlay District.

To minimize future risk, establish an Adaptation Action Area (AAA) Overlay District for areas that are vulnerable to coastal flooding and the impacts of sea level rise, based on the data and modeling outlined within the City's Coastal Resiliency Plan and compliant with §163. 3178, F.S.

Policy 5-2.5.1: Adaptation Action Area (AAA). Within the LDC, the City of Sebastian shall establish criteria for Low Impact Design and Flood Resistant Design for new development and redevelopment within the AAA. Development within this overlay district must comply with coastal development best practices including but not limited to construction engineering solutions and low impact development techniques that utilize vegetation and natural features to minimize surface runoff and reduce flood risk.

Policy 5-2.5.2: Transfer of Development Rights Program. The City shall utilize the Transfer of Development Rights (TDR) program identified in **Land Use Policy 1-1.5.1** to incentivize the preservation of natural resources and habitats including those within vulnerable areas and also those identified within but not limited to the City's Coastal Resiliency Plan. The City shall designate parcels within the established CHHA or proposed AAA Overlay District as sending zones for development rights, and less vulnerable parcels outside of the established CHHA or proposed AAA as receiving sites for density and intensity transferred through the TDR program. This allows development at higher densities in low risk areas and encourages less intense development in the City's floodplains and natural areas.

Objective 5-2.6: Continuing Evaluation of the Conservation & Coastal Management Element Effectiveness. Evaluate the effectiveness of the **Conservation & Coastal Management Element**.

Policy 5-2.6.1: Review the Impact of Changing Conditions on Coastal Management and Conservation Policy. The City shall monitor and evaluate significant changes in the characteristics of natural coastal resources and natural resources within the City. Policy implications of such changes shall be examined, and corrective measures shall be pursued. Coastal management and conservation policies shall be refined as needed in order to remain responsive to evolving problems and issues.

Policy 5-2.6.2: Schedule, Budget and Implement Programmed Activities. The timely scheduling, programming, budgeting and implementation of programmed coastal management activities and conservation activities identified in this Element shall be evidence of the City's effectiveness in carrying out a systematic program for implementing coastal management and conservation goals, objectives, and policies.

Policy 5-2.6.3: Coordinate with Public and Private Sectors. While continually implementing and evaluating the **Conservation & Coastal Management Element**, the City shall maintain a process of



intergovernmental coordination as well as coordination, with private sector groups interested in coastal management and conservation policy and programs. The effectiveness of this approach shall be evaluated by the success of coordination mechanisms in resolving coastal management and conservation problems and issues.

Policy 5-2.6.4: Achieve Effective Resolution of Coastal Management and Conservation Goals, Objectives and Policies. The effectiveness of the **Conservation & Coastal Management Element** shall be measured by the City's success in achieving coastal management and conservation goals, objectives and policies. The **Conservation & Coastal Management Element** incorporates a systematic planning process for identifying coastal management and conservation problems and issues and implementing corrective actions.

Policy 5-2.6.5: Intergovernmental Coordination. Specific Objectives and Policies regarding intergovernmental coordination and this Element are provided and identified in the **Governance & Implementation Element**.

DATA INVENTORY AND ANALYSIS

Introduction

Pursuant to the requirements of Chapter 163 of the 2019 Florida Statutes, the **Conservation & Coastal Management Element** consists of a data inventory and analysis that influences the overarching goals, objectives, and policies. This Element sets the foundation for the City to protect its natural environment and protect life and property from natural disasters.

Waterbodies

Utilizing data retrieved from the U.S. Fish and Wildlife Service, **Map 5-1** illustrates the waterbodies located within and surrounding the City of Sebastian. The inland areas of Sebastian which are submerged during all of the year, with the exception of extreme dry periods, include streams, wetlands, lakes, ponds, canals, and waterways. Those areas of Sebastian classified as inland open waterways include Collier Creek, Schumann Lake, three unnamed lakes/ponds, Collier Waterway, and Elkcam Waterway. Wetlands are scattered throughout Sebastian, with concentrations in the northeast and southeast portions of the City. The St. Sebastian River runs along the west side of the City limits and has historically been preserved through setback restrictions.



The Indian River Lagoon rests along the eastern border of Sebastian and is one of the most biologically diverse estuaries in North America. It has been designated as an Outstanding Florida Water and an Estuary of National Significance. The estuary's mangrove wetlands and salt marshes provide a plethora of benefits for the community such as filtering runoff, stabilizing sediments, maintaining water quality, and protecting shorelines from erosion. The Indian River Lagoon is protected by State regulations from impacts of development on its shores, as well as from fill and dredge activities within its waters.

Waterways within the City are protected and will receive only minimal effects from future development. Although development will not encroach into the waterways, urban runoff from adjacent residential neighborhoods could possibly degrade their water quality. However, increases in pollution levels associated with runoff should be minimal, allowing the vegetation and wildlife now present therein to proliferate for years to come.

Wildlife and Habitats

The City of Sebastian's native vegetation and forests as well as wetlands, streams, lakes, ponds, canals, and freshwater waterways including the St. Sebastian River provide vital habitat for wildlife within the City. The Pelican Island National Wildlife Refuge is found along the eastern border of Sebastian. The Pelican Island Wildlife Refuge was the nation's first national wildlife refuge and is designated as a National Historic Landmark and a Wetland of International Importance. The Refuge provides a habitat for endangered species and migratory birds. The Indian River Lagoon estuary also acts as a home for a large variety of plants and animals with concentrations of rare and endangered organisms including mammals, birds, reptiles, fishes, and invertebrates. These species exist in several communities, such as sea grass beds, deep water areas, tidal flats, saltmarsh grass, and oyster bars. Throughout the Indian River Lagoon there are a number of commercially and recreationally valuable species of fin and shellfish. Clams, oysters, crabs and shrimp are the major invertebrates that are commercially valuable in the area. Sea trout, snook, pompano, mullet, and redfish are among the finfish that are harvested both commercially and recreationally from the waters bordering the City of Sebastian.

Marine grasses are generally found in shallow water areas of estuaries. The Indian River Lagoon has a significant amount of grass beds in the vicinity of Sebastian. These species tend to form in distinct zones, with their location depending on water depth. These areas stabilize sediments, entrap silt, recycle nutrients, provide habitat, and are an important direct food source for a number of animals, including the endangered West Indian Manatee. Increased freshwater and storm water run-off as well as dredge and fill activities can cause increased turbidity, siltation, and subsequent degradation of these beds.

Due to shallow waters within the Sebastian area, the top of seagrass beds lie near the surface, making this habitat susceptible to damage from motor boats, both pleasure and commercial craft. Any wildlife thriving in these shallow waters also are susceptible to harm from motor boats. Manatees are susceptible to detrimental impacts from both loss of seagrass beds as well as water crafts. Threats to manatees from water craft may be reduced in areas along the Indian River where reduced speed limits are posted or where manatee habitats are identified and posted as such.

The City of Sebastian should continue to maintain and support Resolution No. R-08-14 which adopts guidelines for the protection of scrub habitat in accordance with land clearing activities. The related goals, objectives, and policies that ensure the protection of wildlife and habitats within this Element are important for the protection of the Gopher Tortoise and Scrub Jay habitats within the City. The Scrub Jay is a bird presently listed as a threatened species by both the United States Fish and Wildlife Service and the Florida Fish and Wildlife Conservation Commission. General locations of their habitat and nesting areas within Sebastian include the area just south of the airport and the Sebastian Highlands area. **Map 5-3** identifies Scrub Jay



locations within the City. Identification of their nesting areas has enabled the City, County, and State to preserve some areas from future detrimental impacts of development. The City’s 2019 report, *Conservation of the Florida Scrub-Jay within the City’s Municipal Airport*, includes a summary of more than 30 years of scrub-jay conservation efforts and regulatory requirements from the Habitat Conservation Plan (1999), the Incidental Take Permit (2000), and other City documentation.

Conservation of Resources

Lands that are conserved within and adjacent to the City are identified in **Map 5-2**. Approximately 901 acres within the City of Sebastian are conservation lands. These areas include:

- Ansin Tract
- Archie Smith Fish House
- Fischer Tract
- North Sebastian CA
- NSCA addition
- Sebastian Harbor Preserve
- Sebastian Scrub CA
- St Sebastian River Greenway
- Jane Schnee Scrub Preserve
- Pelican Island Elementary Scrub Preserve
- Rotary Park

These conservation lands help protect natural resources, enhance environmental quality, conserve vital habitats, and reduce fragmentation within the City.

Threatened and Endangered Species

Wildlife species which have been listed by the United States Fish and Wildlife Service and Florida Fish and Wildlife Conservation Commission as being endangered or threatened in the City of Sebastian are documented in **Table 5-1**. This list is not all inclusive. Some of the species which are included in the list are found infrequently within the City but have ranges that do include Sebastian.

Table 5-1: Threatened and Endangered Wildlife Species

Common Name	Scientific Name	Protection Status
Birds		
Everglade snail kite	<i>Rostrhamus sociabilis plumbeus</i>	Federally Endangered
Red-cockaded woodpecker	<i>Picoides borealis</i>	Federally Endangered
Wood stork	<i>Mycteria americana</i>	Federally Threatened
Audubon's crested caracara	<i>Polyborus plancus audubonii</i>	Federally Threatened
Piping Plover	<i>Charadrius melodus</i>	Federally Threatened
Florida scrub-jay	<i>Aphelocoma coerulescens</i>	Federally Threatened
Rufa ed knot	<i>Calidris canutus rufa</i>	Federally Threatened
Bald eagle	<i>Haliaeetus leucocephalus</i>	Bald and Golden Eagle Protection Act



Common Name	Scientific Name	Protection Status
Least tern	<i>Sternula antillarum</i>	State Threatened
Black skimmer	<i>Rynchops niger</i>	State Threatened
Tricolored heron	<i>Egretta tricolor</i>	State Threatened
Little blue heron	<i>Egretta caerulea</i>	State Threatened
Reddish egret	<i>Egretta rufescens</i>	State Threatened
American oyster catcher	<i>Haemotopus palliates</i>	State Threatened
Florida sandhill crane	<i>Antigone canadensis pratensis</i>	State Threatened
Mammals		
West Indian manatee (Florida manatee)	<i>Trichechus manatus (Trichechus manatus latirostris)</i>	Federally Threatened
Florida panther	<i>Puma concolor coryi</i>	Federally Endangered
Southeastern beach mouse	<i>Peromyscus polionotus niveiventris</i>	Federally Threatened
Florida bonneted bat	<i>Eumops floridanus</i>	Federally Endangered
Bottlenose dolphin	<i>Tursiops truncatus</i>	Marine Mammal Protection Act
Reptiles		
American alligator	<i>Alligator mississippiensis</i>	Federally Threatened (Due to Similarity of Appearance)
Hawksbill sea turtle	<i>Eretmochelys imbricata</i>	Federally Endangered
Leatherback sea turtle	<i>Dermochelys coriacea</i>	Federally Endangered
Loggerhead sea turtle	<i>Caretta caretta</i>	Federally Threatened
Kemp's Ridley Sea Turtle	<i>Lepidochelys kempii</i>	Federally Endangered
Gopher Tortoise	<i>Gopherus polyphemus</i>	State Threatened

Source: United States Fish and Wildlife Service and Florida Fish and Wildlife Conservation Commission

Land Use Cover

According to the St. Johns River Water Management District (SJRWMD) 2013-2016 land use data set, primary land uses and their acreages within the City's boundaries are shown in **Table 5-2** below. Each of these land uses and their corresponding detailed land use covers within Sebastian are broken out in this section. **Map 5-4** delineates the generalized locations of these SJRWMD land uses within the City. Vegetative communities included within these land uses shall be protected to the maximum extent practicable to reduce fragmentation of wildlife corridors. Changes to the character of the community's vegetation and related-densities will likely induce species sensitive to environmental changes to seek more attractive, undisturbed habitats in areas outside Sebastian's corporate limits. However, no abnormal impacts on flora or fauna are expected to occur; only those impacts normally associated with an area experiencing further urbanization are anticipated.



Table 5-2: SJRWMD Land Use Coverage

Land Use	Acreage	Percentage
Agriculture	238	2.5%
Barren Land	13	0.1%
Rangeland	898	9.5%
Transportation, Communication, and Utilities	412	4.3%
Upland Forests	467	5.0%
Urban and Built-Up	6,096	64.2%
Water	853	9.0%
Wetlands	514	5.4%
Total	9,489	100%

Source: Florida Department of Environmental Protection

Agriculture: The Agriculture land use covers within Sebastian include the following:

- Improved Pastures
- Woodland Pastures
- Tree Nurseries
- Citrus Groves
- Herbaceous (Dry Prairie)
- Mixed Upland Nonforested
- Abandoned Tree Crops

Barren Land: The Barren Land land use covers within Sebastian include the following:

- Disturbed Lands
- Spoil Areas

Rangeland: The Rangeland land use covers within Sebastian include the following:

- Herbaceous (Dry Prairie)
- Shrub and Brushland
- Mixed Upland Nonforested

Transportation, Communication, and Utilities: The Transportation, Communication, and Utilities land use covers within Sebastian include the following:

- Airports
- Roads and Highways
- Electric Power Facilities
- Auto Parking Facilities (When not directly related to other land use)
- Communications
- Electrical Power Transmission Lines
- Wet Prairies
- Water Supply Plants (Including pumping stations)
- Surface Water Collection Features



Conservation & Coastal Management

- Emergent Aquatic Vegetation
- Freshwater Marshes
- Surface Water Collection Features

Upland Forest: The Upland Forest land use covers within Sebastian include the following:

- Pine Flatwoods
- Sand Pine
- Longleaf Pine - Xeric Oak
- Upland Hardwood Forests
- Upland Mixed - Coniferous / Hardwood

Urban and Built Up: The Urban and Built Up land use covers within Sebastian include the following:

- Residential
- Commercial and Services
- Cemeteries
- Commercial and Services Under Construction
- Sand and Gravel Pits
- Holding Ponds
- Other Light Industrial
- Institutional
- Marina's and Fish Camps
- Parks and Zoos
- Golf Courses
- Community Recreational Facilities
- Herbaceous (Dry Prairie)
- Shrub and Brushland
- Mixed Upland Nonforested

Water: The Water land use covers within Sebastian include the following:

- Streams and Waterways
- Lakes
- Reservoirs
- Bays and Estuaries

Wetlands: The Wetlands land use covers within Sebastian include the following:

- Bay Swamps
- Mangrove Swamps
- Mixed Wetland Hardwoods
- Cabbage Palm Hammock
- Wetland Forested Mixed
- Freshwater Marshes
- Wet Prairies
- Mixed Scrub-shrub Wetland
- Emergent Aquatic Vegetation

Primary vegetative communities within the City that are listed above include, but are not limited to, wet prairies, mixed scrub-shrub wetland, freshwater marshes, mixed wetland hardwoods, sand pine, upland hardwood forests, pine flatwoods, mixed upland non-forested, shrub and brushland, and herbaceous upland non-forested. These primary vegetative communities indigenous to Sebastian are described below based upon data and information from the Florida Fish and Wildlife Conservation Commission.

Wet prairies: Wet prairies are flatland or slope with sand or clayey sand substrate. They are usually saturated but only occasionally inundated. They are statewide excluding the extreme southern peninsula. Wet prairies experience frequent fire (2-3 years). They are a treeless, dense herbaceous community with few shrubs. Included is wiregrass, blue maidencane, cutthroat grass, wiry beaksedges, flattened pipewort, toothache grass, pitcher plants, and coastal plain yellow-eyed grass.

Mixed scrub-shrub wetland: Mixed scrub-shrub wetlands are wetland areas that are dominated by woody vegetation less than 20 feet in height. This can occur in many situations, but in most cases involves transitional or disturbed communities on drier sites. Persistent examples of shrub wetlands include shrub bogs and willow swamps.

Mixed wetland hardwoods: Mixed wetland hardwoods are wetland hardwood communities which are composed of a large variety of hardwood species tolerant of hydric conditions yet exhibit an ill-defined mixture of species.

Freshwater marshes: Freshwater marshes are long hydroperiods that are dominated by grasses, sedges, broadleaf emergents, floating aquatics, or shrubs.

Sand pine: Sand pine is found on ridges throughout the state. It experiences rare fire (20-80 years). It includes a canopy of sand pine and an understory of the three shrubby oaks, or less commonly, and Florida rosemary.

Upland hardwood forests: Upland hardwood forests are located upland with sand/clay and/or calcareous substrate. Located from the Panhandle to the central peninsula. It experiences rare or no fire. Includes a closed deciduous or mixed deciduous/evergreen canopy. Also includes American beech, southern magnolia, hackberry, swamp chestnut oak, white oak, horse sugar, flowering dogwood, and mixed hardwoods.

Pine flatwoods: Pine flatwoods include mesic pine woodland or mesic shrubland on flat sandy or limestone substrates, often with a hard pan that impedes drainage.

Mixed upland non-forested: Mixed upland non-forested areas include upland non-forested landscape in which neither herbaceous nor shrubs cover over 2/3 of the area. It may include areas where tree species are regenerating naturally after clear cutting or fire but are less than 20 feet tall. These include native hardwood and coniferous species, but does not apply to plantations

Shrub and brushland: Shrub and brushland includes saw palmettos, gallberry, wax myrtle, coastal scrub and other shrubs and brush. Generally, saw palmetto is the most prevalent plant cover intermixed with a wide variety of other woody scrub plant species as well as various types of short herbs and grasses. Coastal scrub vegetation would include pioneer herbs and shrubs composed of such typical plants as sea purslane, sea grapes and sea oats without any one of these types being dominant.

Herbaceous upland non-forested: Herbaceous upland non-forested areas include upland nonagricultural, non-forested lands which contain no evidence of cattle grazing. It includes areas that have over 67% herbaceous cover, not counting any forested inclusions, which may be up to 25% of the area. It also includes prairie grasses which occur on the upland margins of the wetland zone and may be periodically inundated by water. Generally, it is the marginal area between marsh and upland forested areas. These grasslands are



generally treeless but in wet areas would have many types of soils resulting in a variety of vegetation types dominated by grasses, sedges, rushes and other herbs while dryer grass areas would be dominated by wire grasses with some saw palmetto present.

Air Quality

The Florida Department of Environmental Protection rates the quality of air in the City of Sebastian as good. The absence of major industries in the area helps to support the air quality in the City. Pollution generated from commercial and industrial developments within and adjacent to the City is not anticipated to adversely affect the air quality of Sebastian. Fugitive dust particles from land cleared for development may be experienced by the community, and developers should be requested to quickly replant development areas following clearing. The majority of air pollution in the City of Sebastian continues to emanate from automobile emissions. As the population in the area continues to increase so will traffic and emissions.

Water Quantity and Quality

This section analyzes the current and projected water needs and sources based on the demands for industrial, agricultural, and potable water use and the quality and quantity of water available to meet these demands.

Water Demands

The City of Sebastian’s potable water is provided by a system operated by the Indian River County Utilities Department. The City is located within the North County Service Area and serviced by the North County Water Treatment Plant. Potable water in the City of Sebastian is received from either private on-site wells or from the County’s water treatment plant. Currently, the plants operated by the Indian River County Utilities Department use the Upper Floridan aquifer as their primary water source. The County uses reverse osmosis to treat water drawn from the Floridian Aquifer. Located on the north side of 77th Street, west of 58th Avenue, the North County Water Treatment Plant began operating in 1997. According to Indian River County , the current permitted design capacity of the plant is 11.44 MGD. Currently, there is adequate treatment capacity for the planning period. Additionally, the County is currently upgrading the Roseland Tank to a storage and repump station that will improve pressure in the North Sebastian area.

According to the **Land Use Element**, zero percent of the City’s acreage is designated for Agriculture. No change in agricultural land uses is anticipated in the foreseeable future. According to the Indian River County Comprehensive Plan Potable Water Sub-Element, the existing and projected industrial demand for the North County area is and will continue to be 2,500 gallons per day (GPD) per gross acre. The City’s adopted Level of Service Standard for potable water is 250 gallons per day per equivalent residential unit. **Table 5-3** provides a listing of the projected potable water demand based upon the population projections and the entire City being connected to the County potable water system. In order to meet projected demand in 2040, the City will require an estimated 3,978,000 gallons per day. To ensure the efficient and acceptable delivery of potable water services to the City of Sebastian continued coordination with Indian River County Utilities is recommended.

Table 5-3: Projected Potable Water Demand

Year	Population	Residential Units	Gallons/Unit/Day	Estimated Average Demand (gallons/day)
2020	25,957	11,616	250	2,904,000
2025	28,562	12,933	250	3,233,250



2030	30,806	14,100	250	3,525,000
2035	32,757	15,029	250	3,757,250
2040	34,567	15,912	250	3,978,000

Source: Population projections and household estimates from Florida Housing Data Clearinghouse

Water Conservation

The City of Sebastian participates in water conservation, use, and protection through programs and policies supported by SJRWMD. Per Section 373.016, F.S., the SJRWMD, and all other water management districts are required to "promote the conservation, replenishment, recapture, enhancement, development, and proper utilization of surface and groundwater." To accomplish this directive, the SJRWMD considers conservation in the development of policy and rules, public information programs, planning, and resource management and evaluation.

Conservation measures are also witnessed through the use of a consumptive use permitting process, which enables the SJRWMD to review certain proposed and existing developments for reasonable and beneficial use of water.

The SJRWMD encourages the reuse of wastewater for irrigation purposes as a measure to conserve water. Incentives to install and utilize wastewater reuse facilities are provided in the Water Management District's permitting process for wastewater treatment facilities.

Included among the SJRWMD's conservation efforts is a program targeted at plugging unattended, free-flowing artesian wells. This program attempts to identify abandoned wells, seal them, and restore them to their natural hydrologic condition.

SJRWMD also promulgates information to the public concerning water conservation. Pamphlets, slide shows, speeches, and addresses made through media sources are a variety of ways in which the District educates and informs the public about water conservation.

Aquifer Recharge

There are no areas within the City that have been adopted by the St. John's River Water Management District as prime groundwater recharge areas for the Floridan aquifer. The coastal ridge area has the best recharge potential. However, most of this area has been developed as part of the "Old Town." Other portions have been mined for sand. The Floridan aquifer is recharged in eastern Osceola County and very little down migration of water is possible due to two factors:

- A confining layer of silt and clay and various other materials separates the surficial and deep (Floridan) aquifer; and
- The potentiometric surface of the aquifer is approximately +30 feet NGVD (National Geodetic Vertical Datum), this upward pressure will not permit recharge except under extremely high head conditions.

The top of the surficial aquifer within the City is generally located between five (5) and ten (10) feet below the ground surface but may be much closer to the ground surface depending upon the amount of rainfall which is present. The rainfall in the area recharges the surficial aquifer, and as such, the water table depth fluctuates with the amount and intensity of the rainfall.

The surficial aquifer recharge areas within the City may not supply large quantities of water to the aquifer but serve to prevent lateral saltwater intrusion into inland groundwater supplies.



The City's zoning regulations, flood damage prevention ordinance, and subdivision regulations accomplish an adequate degree of protection for natural drainage and recharge areas. Sebastian's existing land use has generally developed in a manner favorable to natural groundwater recharge and natural flood protection.

Water Quality

The degradation of water quality in Sebastian may be a concern with the potential for increased growth and urbanization. With an increase in impervious surfaces the more concern there is for pollutants and runoff into water bodies. A decrease in water quality can cause several issues for the City including harmful algal blooms. Improvement of water quality should continue to be a cooperative effort between the City, the County, St. Johns River Water Management District (SJRWMD), the National Estuary Program, Indian River County Mosquito Control District, and the Natural Resource Conservation Service. SJRWMD has also worked with Florida Department of Health, Indian River County Department of Environmental Health, the Marine Resources Council of East Central Florida, and the National Estuary Program to monitor surface water quality.

Urban run-off is a major contributor of pollutants to the surface waters of the City and Indian River County. Utilization of more advanced treatment techniques and storm water management will assist in decreasing the detrimental effects of pollution on the natural systems of the City. Impacts of sea level rise and combined rain events may affect water quality and a pollutant load model may need to be developed as recommended in the City's Coastal Resiliency Plan. The City's Stormwater Management Plan shall identify approaches to address existing and potential deficiencies in the City's existing stormwater management system to maintain water quality.

Indian River County operates all centralized potable water and sanitary sewer service in Sebastian. Therefore, any of the existing wastewater treatment plants that were discharging into the Lagoon are now deactivated and not polluting the waters. As more septic tanks are connected to central sewer, the opportunity for pollutants from septic tanks to enter the Lagoon will be eliminated.

As stated in the Basin Management Action Plan (BMAP) for the Central Indian River Lagoon (2013), the Florida Department of Environmental Protection (FDEP) has classified the estuary bordering the City of Sebastian as:

- Class II waters which have a designated use of shellfish propagation or harvesting; and
- Class III waters which means that it must be suitable for recreation and must support the propagation and maintenance of a healthy, well-balanced population of fish and wildlife.

FDEP develops and adopts total maximum daily loads (TMDLs) for the waterbody segments it identifies as impaired. A TMDL is the maximum amount of a specific pollutant that a waterbody can assimilate while maintaining its designated uses. As stated in the BMAP, FDEP adopted the nutrient TMDLs for the main stem of the IRL Basin in March 2009. The TMDLs focus on the water quality conditions necessary for seagrass regrowth at depth limits where seagrass historically grew in the basin, based on a multiyear composite of seagrass coverage. The median depth limits of seagrass coverage in the IRL Basin decreased over the years due to decreased water quality resulting from anthropogenic influences. As polluted runoff reached the lagoon, it created conditions that prevented the seagrass from growing in deeper water.

As described in the BMAP, the Central Indian River Lagoon is currently meeting the TMDL seagrass depth limit targets. The purpose of the BMAP is to document the completed projects that contributed to this success and to identify future projects to continue seagrass improvement.



Soils

Soils indigenous to Sebastian are a natural resource that has been an important factor in the development of the City. In earlier times, when agriculture was a major occupation, soil properties were a crucial determinant of the success of a farm or grove. Other development occurred, given the right location, on soils having the least limitations and requiring the least amount of corrective measures. Under the economics of land development today, the choice of land for a specified use is more often determined by factors such as location rather than the kind of soil. However, knowledge of the types of soil present in Sebastian is still important in assessing the limitations or reclamation that must be done to develop a site. The Indian River County Soil Survey prepared by the Soil Conservation Service and revised in September 2019 gives details of the 30 different soil types that exist in Sebastian. The soil classifications are made based upon the water table, slope, erosion potential, permeability, subsidence and organic (muck/peat) content. The soils are also rated as to their potential for development based upon those limiting properties. Soil types covering the City are illustrated in **Map 5-5**.

According to DEP's Division of Water Resource Management, there are no commercially valuable deposits of coquina, dolomite, phosphate, clay, or peat present within the City of Sebastian. No active or inactive mineral mining sites, other than sand mining along the coastal ridge in the southeast portion of the City, have been identified within the City. The City of Sebastian does not have any specific areas of soil erosion. Erosion potential can be mitigated by reducing the time interval between the clearing of land and actual development or construction.

Coastal Area

The coastal area in Sebastian is defined as the area between U.S. 1 and the Indian River Lagoon, except where North Central Avenue intersects with U.S. 1, then the eastern edge of North Central Avenue shall constitute the western boundary of the City's coastal area. The land uses along the Indian River Lagoon within Sebastian consist mainly of commercial land uses with several recreational and open space areas. In addition to the commercial uses, there are several scattered residential uses located within the coastal area. The coastal area is approximately 65 acres in size. The **Land Use Element** identifies historically significant buildings within the City of Sebastian. Since the vast majority of the historical sites in Sebastian are located within the coastal area, it is important for the City to preserve these sites.

Water Dependent Uses

Water dependent uses are activities that can be carried out only on, in, or adjacent to water areas because the use requires access to the water body. Within Sebastian, these activities include public and private marinas, fishing, boating, kayak launches, and active and passive recreation. The waterfront area is a vital economic activity area within the City. The ambiance of the City is perhaps rooted in this area. The City has a Riverfront Plan for the waterfront area to spur revitalization and redevelopment. The City places a high value on the few water dependent facilities and looks forward to their continued use, maintenance, and enhancement over time.

A number of water-dependent structures are located east of Indian River Drive including three marinas, two piers, and two boat ramps. There are also several small privately-owned boat docks and piers but they do not represent major water-dependent or related land uses. The marinas are located in an area that is suitable for marina activities. Along the Indian River Lagoon shoreline, the City has two major access points at the Municipal Pier and at the Yacht Club and Boat. The waterfront area spans approximately 9,000 linear feet within the City limits. The natural resources within Sebastian are used for water dependent uses and commercial fishing. The Indian River Lagoon provides the most extensive resource-based recreational area



within the City. Fishing, boating and other water-dependent recreation are available throughout the Aquatic Preserve.

Water Related Uses

Water related uses are activities which are not directly dependent upon access to a water body, but which provide goods and services that are directly associated with water-dependent or waterway uses. Water related uses include: boat storage, marine repair, retail boat and trailer sales, marine industrial (boat building, boat yards, hull work and painting, marine construction), tropical fish collection and sales, fish houses (wholesale and retail fish sales, processing, and packaging), commercial fishing support (trap storage, building and dipping), ship stores, bait and tackle stores, and dive shops. The City has no water related activities aside from the water dependent activities discussed herein.

Coastal Economy

The City of Sebastian strives to provide a highly desirable natural setting with water oriented recreational amenities for its residents. The waterfront core area is a vital economic activity area within the City. The riverfront plays an important role in Sebastian's economy. In order for the City to retain the natural beauty of the area as well as increase the economic base, a mix of residential and commercial uses is necessary within the coastal area.

As stated in the Basin Management Action Plan for the Central Indian River Lagoon (2013), the IRL is a valuable ecological and economic asset for the state of Florida and the counties that border the lagoon and its tributaries. The lagoon directly and indirectly supports a large part of the region's and the state's economy. The basin supports the multimillion-dollar Indian River citrus industry and boat and marine sales industries. Finfish and shellfish harvesting from the lagoon contribute to local economies. A 2008 economic study (Hazen and Sawyer) carried out for the IRL NEP estimated the total value of the lagoon's benefits to residents and visitors at \$3.725 billion, measured in 2007 dollars. The Impact Analysis for Planning Regional Economic Input Output Model was used to estimate the economic contribution of lagoon-related expenditures. More than \$1.3 billion of economic benefit was generated from money spent on recreational activities, both from residents and visitors, including items such as boat purchases, boat repairs, and marina slip rental and dockage fees. An additional \$762 million was estimated for recreational use value, which is the amount that people would be willing to pay for the opportunity to engage in a recreational activity on the lagoon. Therefore, the total value for 2007 for lagoon-related recreation was close to \$2.1 billion.

A significant increase in the amount and diversity of wildlife on the lagoon and improved water quality in the basin would increase the recreational use value of the entire IRL system by about \$80 million per year. Other recreational expenditures and real estate values may also increase under improved environmental conditions but were not estimated during the study. The increase in value reflects a greater willingness by residents and visitors to pay to improve the environmental quality of the lagoon (Hazen and Sawyer 2008). The economic value of the IRL Basin's seagrass beds was estimated at \$329 million per year for 72,400 acres of seagrass. Seagrass habitats are an important component of the lagoon's ecology and are the foundation of the food web for many of the animals that live in the IRL by providing nursery and feeding areas. This is particularly true for many of the recreational and commercial fish species. Seagrass may provide additional economic value related to water quality and aesthetics (Hazen and Sawyer 2008). Therefore, investing in projects and programs to improve the lagoon's water quality and seagrass beds is not only important for environmental considerations but also to improve the economy.



Land Use Conflicts

At this time there are few if any conflicts related to land use in the coastal area; however, this could change in the future. The Riverfront Plan sets up guidelines for improving the riverfront, including preservation of strategic areas. The goals, objectives, and policies of this Element will govern any conflicts that arise between land uses proposed in the Riverfront Plan and the environmentally sensitive portions of the coastal area. It is the purpose of this Element to protect estuarine resources from the adverse impacts of development and to prevent potential conflict associated with development or redevelopment of marine related activity in the waterfront core area.

Floodplains

Flood zones allocated in the City of Sebastian are illustrated in **Map 5-6**. There are several areas within the City of Sebastian which have been identified by the Federal Emergency Management Agency (FEMA) as having the potential for flooding in the 100-year storm event. Flood Zone A and AE represent the 100-year storm event flood levels. Also included in the map is the 500-year storm event area (X500). These areas are subject to rising waters due to their proximity to nearby rivers, tributaries, and lakes.

The City's Coastal Resiliency Plan includes additional flood data and maps regarding storm surge and future sea level rise. The vulnerabilities that Sebastian faces due to sea level rise are outlined in this Plan and include possible impact to outdoor facilities, City streets, and lift stations in future flooding events. Tropical storms and hurricanes may further increase these risks. The Coastal Resiliency Plan also outlines mitigation strategies such as defining existing street and structure flooding levels of service.

Coastal High Hazard Area

The Coastal High Hazard Area is an area particularly vulnerable to the effects of coastal flooding from tropical storm events and is defined by section 163.3178(2)(h)9, Florida Statutes, as the area below the elevation of the category 1 storm surge line as established by a Sea, Lake, and Overland Surges from Hurricanes (SLOSH) computerized storm surge model (See **Map 5-7**). The only structures within the CHHA in Sebastian are mobile homes. Additional infrastructure in the City that has been inventoried or identified as being at risk to sea level rise or flooding is recorded in the City's Coastal Resiliency Plan. The threats of sea level rise and flood events should be taken into consideration in regard to development and redevelopment strategies used in the CHHA as defined in § 163.3178(2), F.S. The restriction of development activities and limiting of public infrastructure expenditures within the CHHA and hazard prone areas should also be considered.

Hurricane Vulnerability Zone

The hurricane vulnerability zone for the City of Sebastian has been identified as those areas requiring evacuation during the event of a 100-year storm, or Category 3 hurricane. The areas requiring evacuation during such occurrences are the Indian River Lagoon shoreline, the 100-year floodplains, mobile home residences, and areas receiving impacts from Category 3 hurricane storm-surge heights. Generally, areas experiencing Category 3 storm-surge impacts lie within the 100-year floodplain. Areas within the City receiving storm-surge impacts during Category 3 storm events are within the 100-year floodplain for either the Indian River or Sebastian River. Development and redevelopment strategies should be used to reduce flood risk in these areas as defined in § 163.3178(2), F.S. Maps of the City's storm surge zones are documented in **Map 5-8** and the City's evacuation zones are illustrated in **Map 5-9**.



Shelter Capacity

During natural disasters, residents will seek refuge at public shelters managed by either the American Red Cross or the Indian River County Emergency Management Service. The primary evacuation shelters within Sebastian include Pelican Island Elementary School, Sebastian Elementary School, Sebastian River Middle School, and Sebastian River High School. Although public shelters are dispersed throughout Indian River County, some County residents from other evacuation zones or from neighboring coastal Counties may choose to take refuge at Sebastian area shelters, yet, their numbers are expected to be minimal. Therefore, the City's local shelters adequately meet the needs of those seeking shelter.

Evacuation Routes

The evacuation routes out of the City of Sebastian include US 1 and CR 512. These two roadways also serve most of the northern half of the County. US 1 runs north and south through the entire County and would be used by a number of residents to evacuate into other counties. CR 510 via the Wabasso Causeway would provide an evacuation route for the residents of the north barrier island. CR 510 connects with CR 512 west of Sebastian and CR 512 connects with I-95 a few miles west of the CR 510 intersection. Because the evacuation routes serving the City also serve the County, hurricane evacuation planning must be done on a countywide basis.

Constraints are likely to prevail on certain segments of U.S. 1 and C.R. 512 since they both traverse through areas subject to flooding from 100 to 500-year storm waters. The segment of U.S. 1 just south of C.R. 512 north to Main Street lies within a 100 to 500-year floodplain, while a quarter-mile length of C.R. 512 crosses the 100-year floodplain associated with Collier Creek. The potential for road-surface flooding during heavy rainfall is greater along these road segments within Sebastian than along others.

Evacuation clearance times for Indian River County will vary based on storm levels and impacts associated with a hurricane. In case of a hurricane threat, Sebastian residents will be notified by radio and television broadcast systems and the mobile public-address system on appropriate time to evacuate their areas. Proper notification will allow sufficient time for Sebastian residents to evacuate the area. The City's Coastal Resiliency Plan outlines societal exposure to hurricanes especially to the older population. The demographics of the city may impact the warning time that the City needs to provide to its residents. The Indian River County Emergency Management Department maintains a file of the physically handicapped and individuals with special needs. Special transportation has been arranged which includes vans and hydraulic lifts, ambulances, taxis, and private vehicles. Red Cross officials also have designated special shelters. Evacuation Routes are illustrated in **Map 5-10**.

According to the City's Coastal Resiliency Plan, the results for 2070 sea level rise show nominal impact to City maintained streets and Emergency Evacuation Routes.

Disaster Preparedness

In order to be prepared for natural disasters such as hurricanes, sea level rise, and flooding the City should take preventive action. The *Official Disaster Preparedness Guide for Indian River County* is a source of information for residents to be better prepared for natural disasters that occur. The City's Coastal Resiliency Plan outlines adaptation strategies to increase the City's resilience to natural disasters and to decrease the detrimental impacts to residents and the environment. The adaptation strategies were screened qualitatively using the following criteria:



Conservation & Coastal Management

- Ability to increase resilience
- Cost and benefits
- Community acceptance
- Environmental impacts
- Socio-economic impacts

A summary of the screening criteria is provided in **Table 5-4**. The table below summarizes potential adaptations and their impacts within the community.

Table 5-4: Potential Adaptation Strategies

Potential Adaptation Strategies	Ability to Increase Resilience	Cost and benefits	Community Acceptance	Environmental Impacts	Socio-economic impacts
Canal Bank Inspections	●	●	●	●	●
Define Street and Structure Level of Service	●	●	●	●	●
Retrofit Outfalls with Inline Check Valve	●	●	●	●	●
Update Comprehensive Plan	●	●	●	●	●
Update Stormwater Master Plan	●	●	●	●	●
Raise Lift Station Electrical Controls	●	●	●	●	●
*Level of value to the City: ● = High ● = Medium ● = Low					

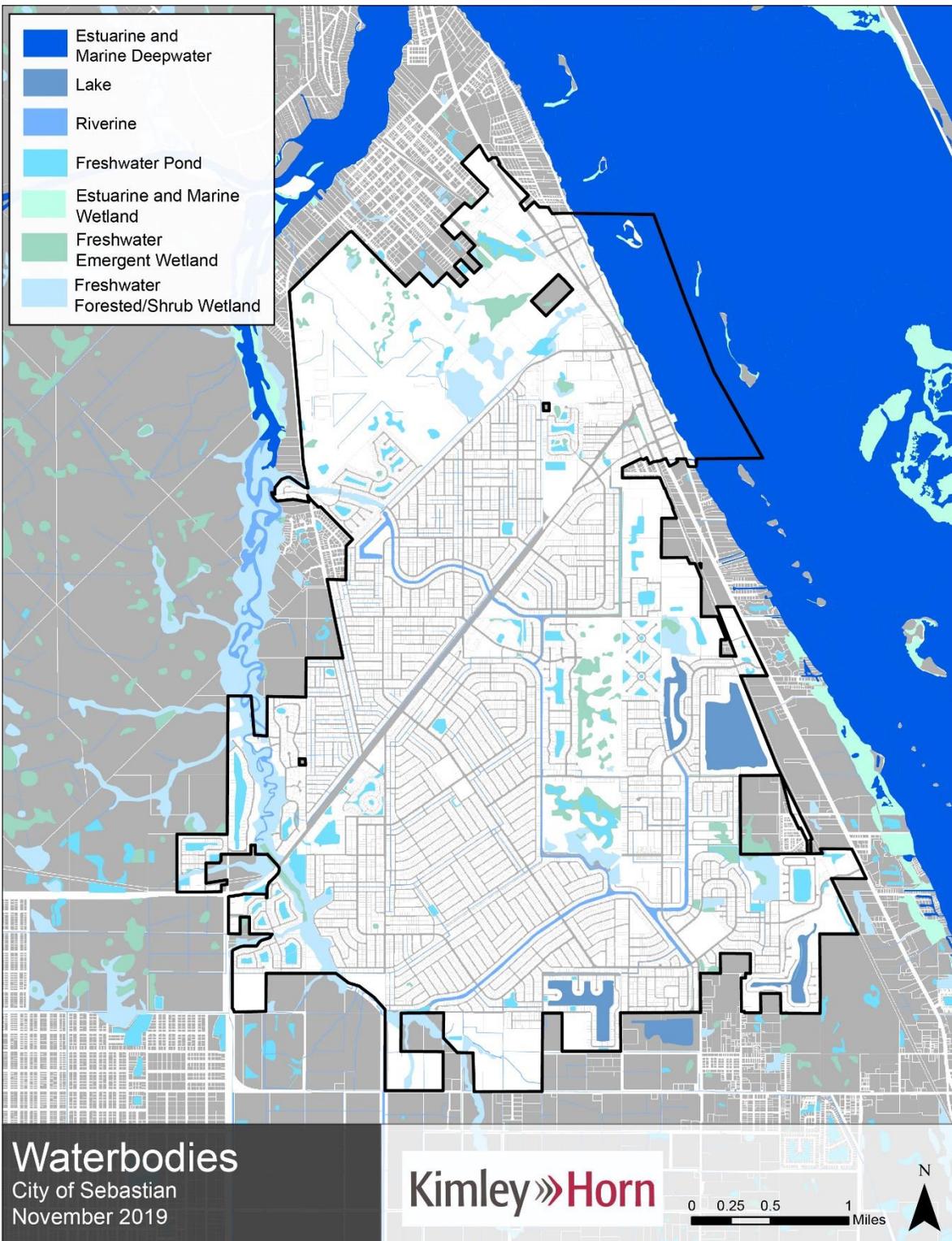
Source: City of Sebastian Coastal Resiliency Plan

These adaptation strategies will help the City to be better prepared and recover more quickly from natural disasters.

Conclusion

Per Chapter 163.3177 of Florida Statutes, this Conservation & Coastal Management Element provides for the conservation and protection of natural resources in the area, including air, water, water recharge areas, wetlands, waterwells, estuarine marshes, soils, beaches, shores, flood plains, rivers, bays, lakes, harbors, forests, fisheries and wildlife, marine habitat, minerals, and other natural and environmental resources. This Element’s data inventory and analysis influences the overarching goals, objectives, and policies for conservation and coastal management within the City. This Element sets the foundation for the City to protect its natural environment and protect life and property from natural disasters.

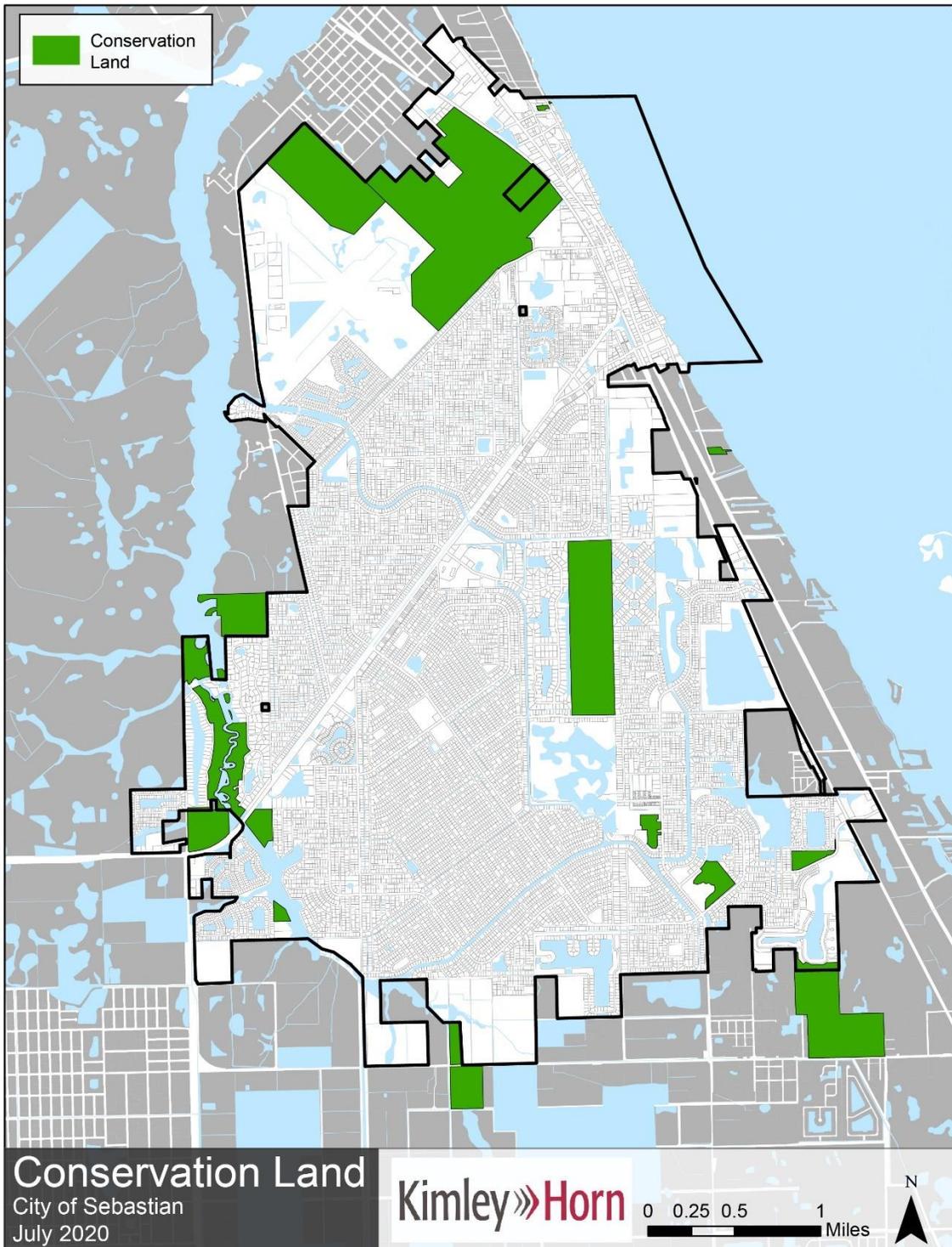
Map 5-1: Waterbodies



Source: U.S. Fish and Wildlife Service



Map 5-2: Conservation Land



Source: City of Sebastian

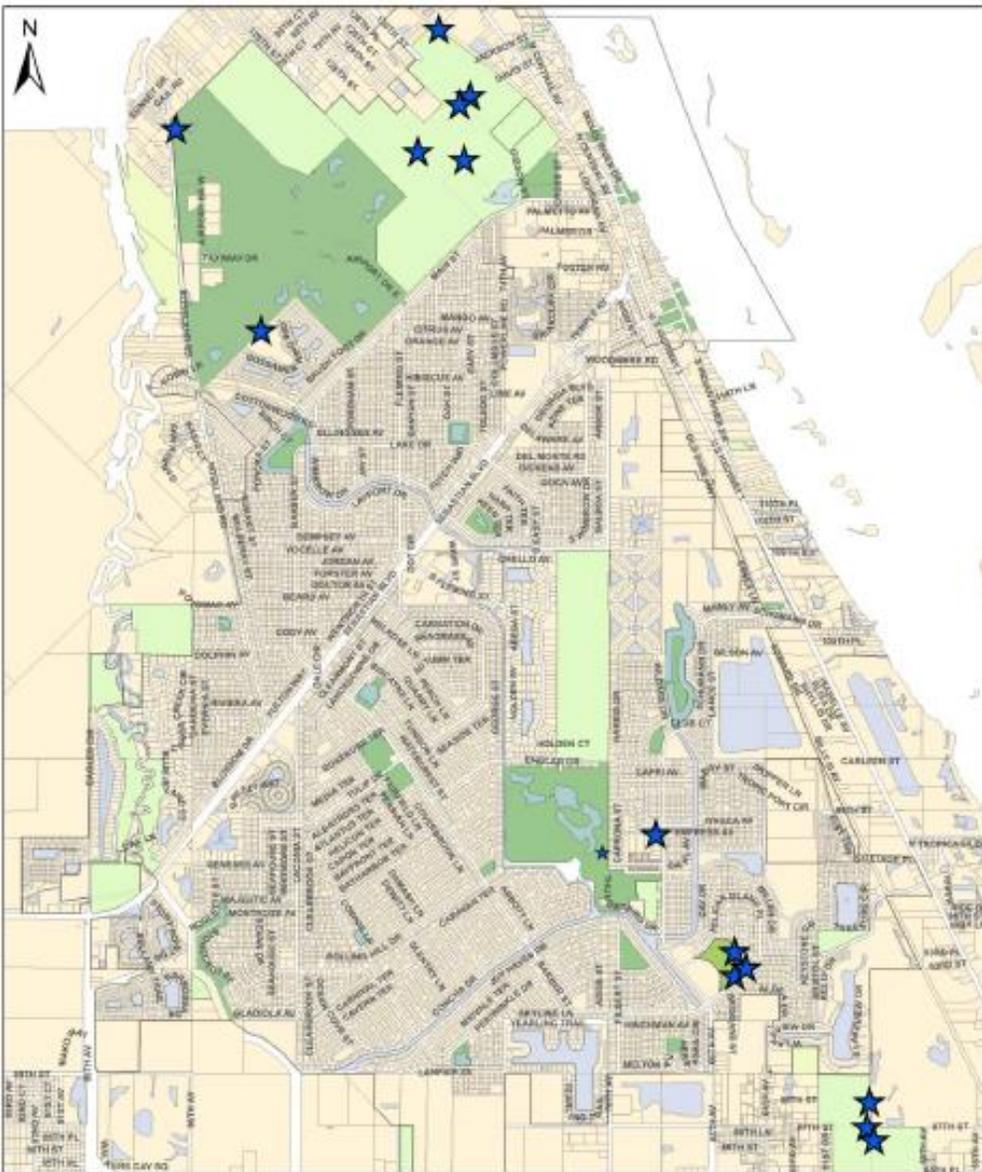


Map 5-3: Scrub Jay Locations



Scrub Jay Locations

City of Sebastian, Florida



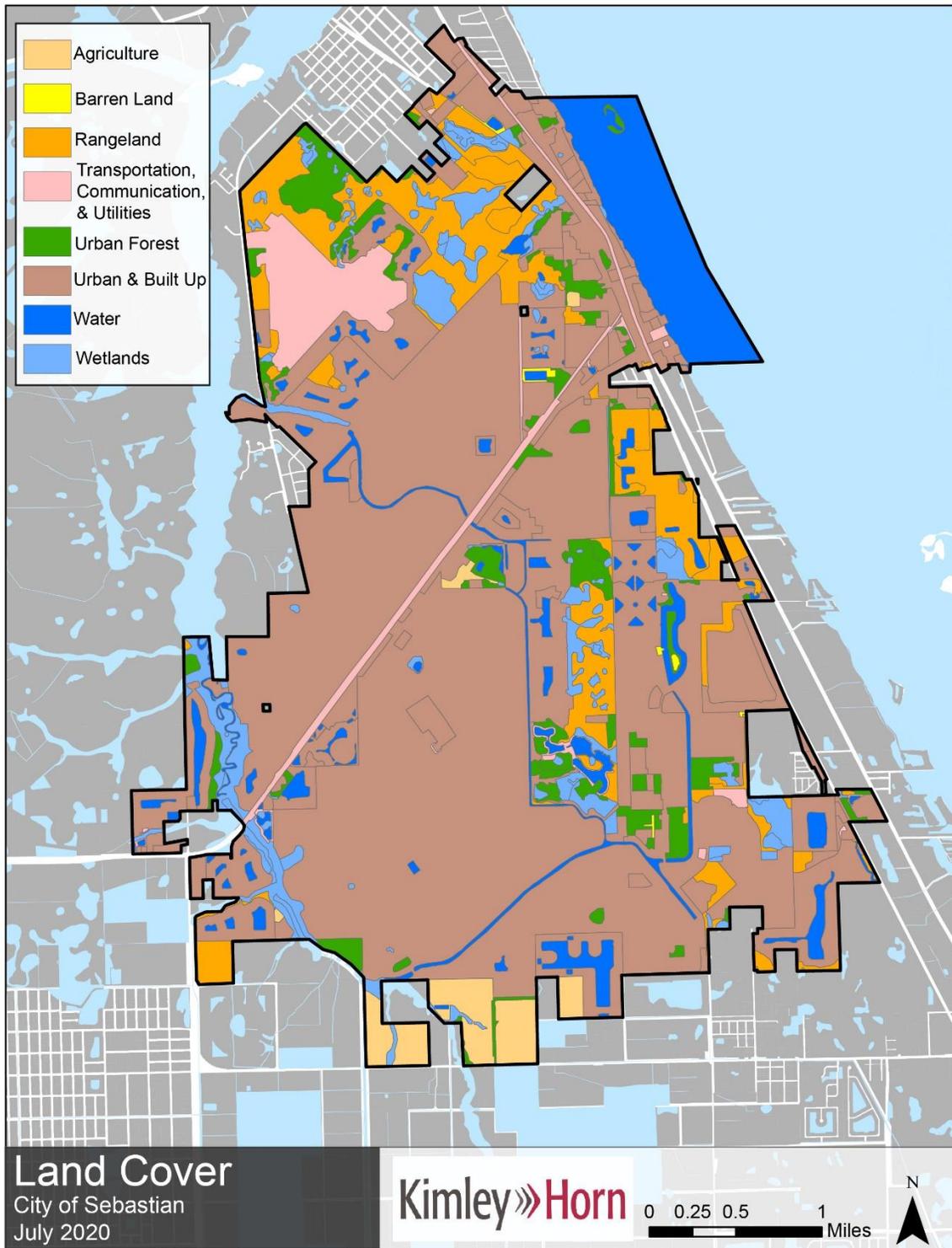
M:\2018 Maps\COS_ScrubJay_2010

COS GIS 3/26/2018

Source: City of Sebastian Conservation of the Florida Scrub-Jay within the City of Sebastian, and the City's Municipal Airport (2019)



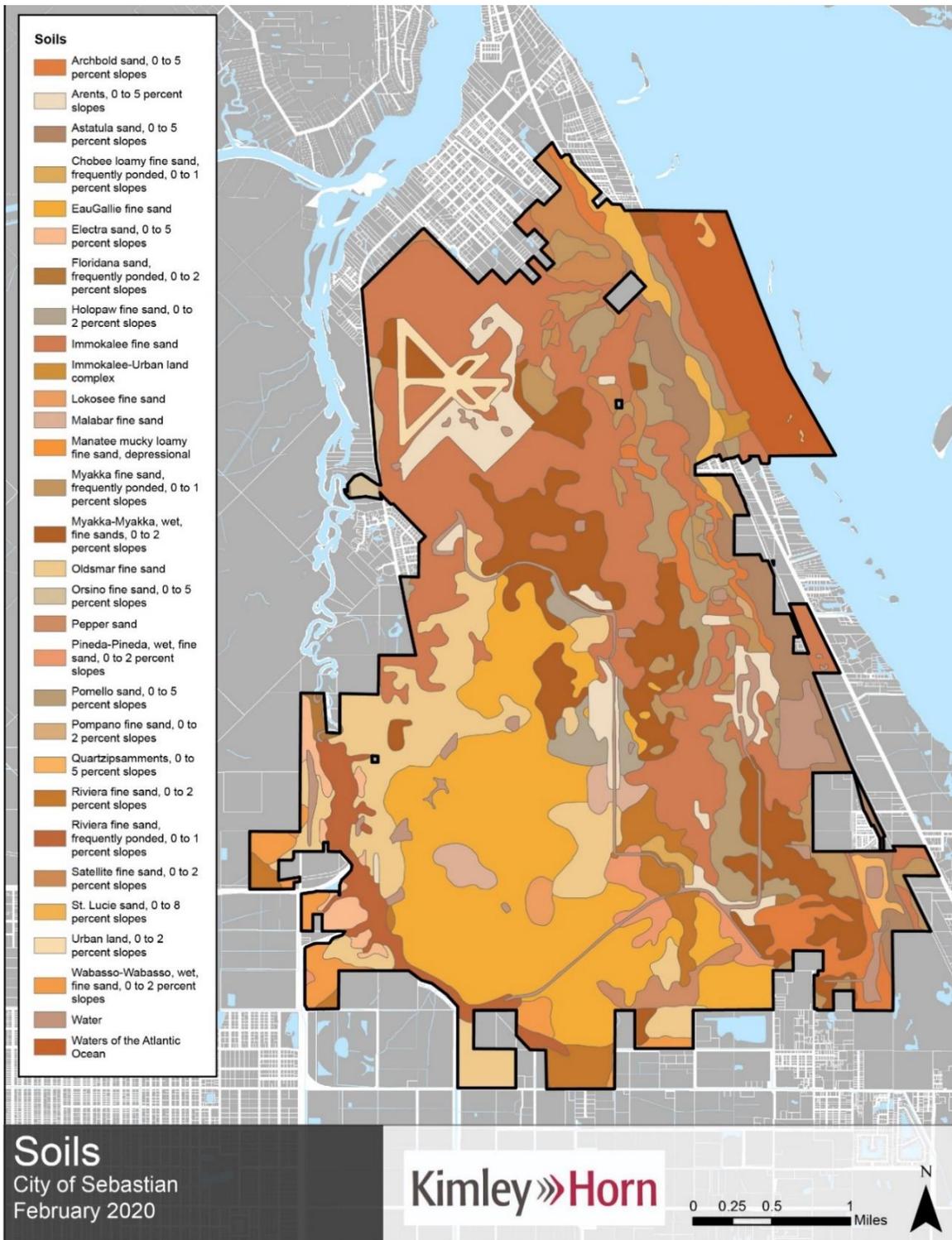
Map 5-4: Land Cover



Source: Florida Department of Environmental Protection



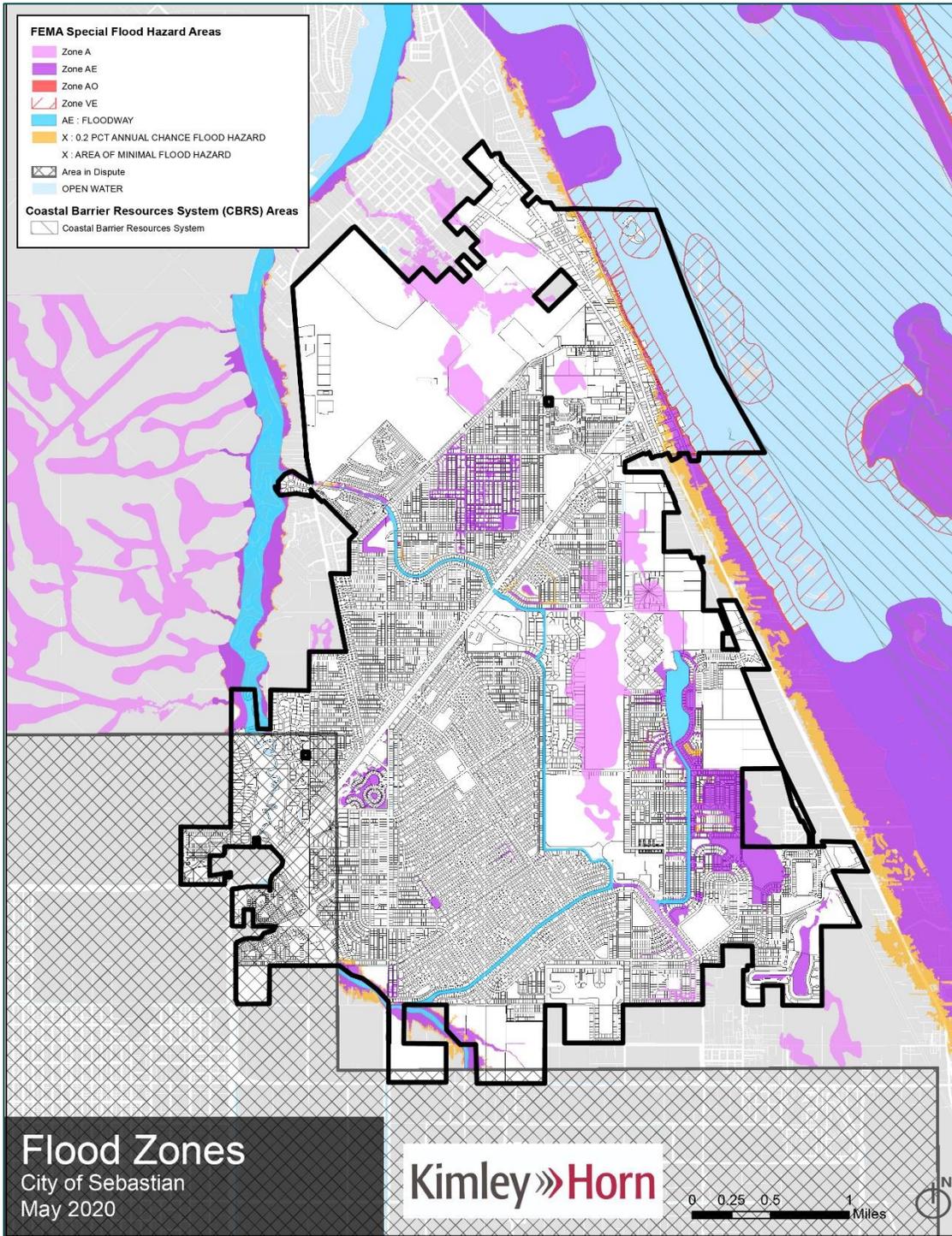
Map 5-5: Soil Types & Topography



Source: Soil Conservation Service



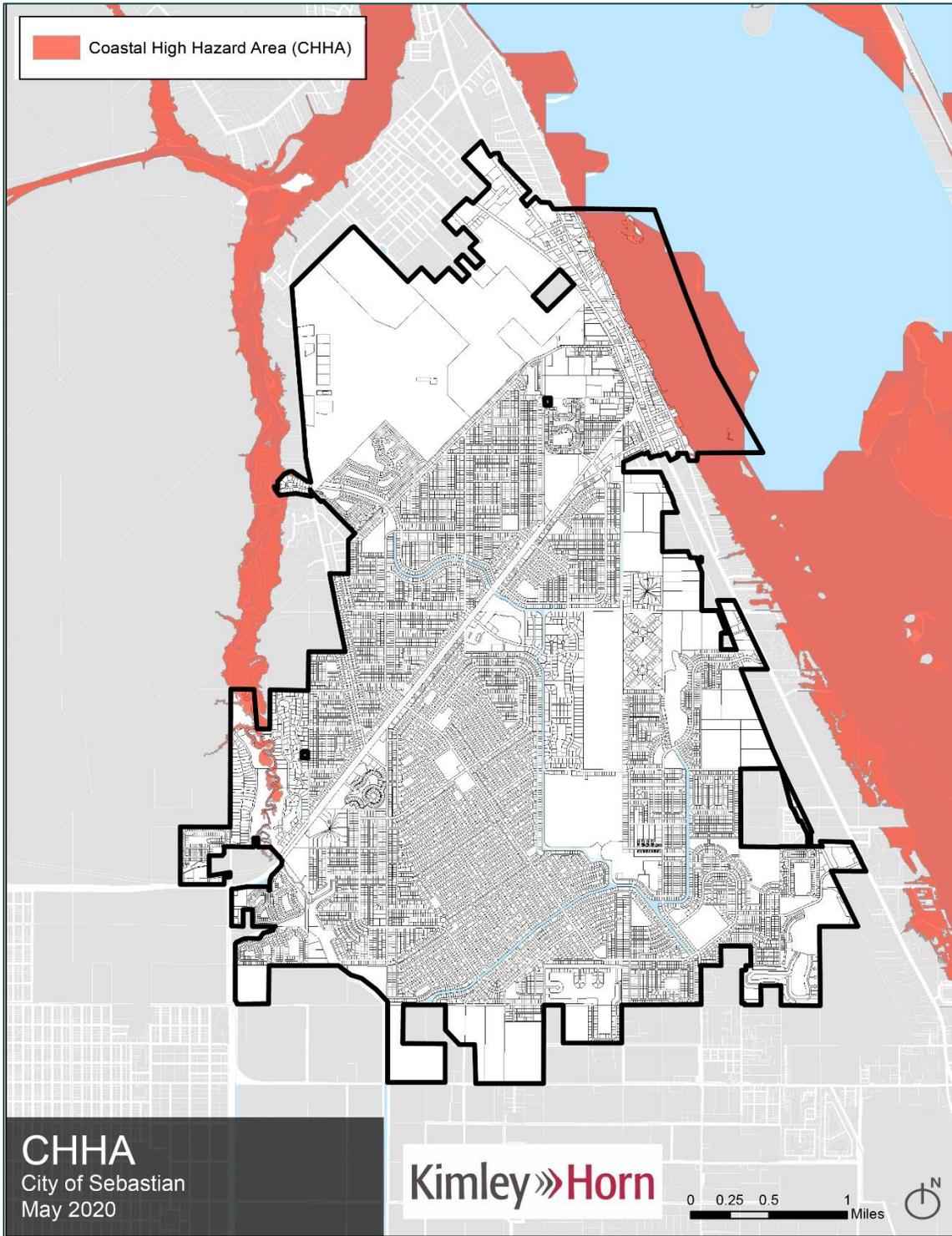
Map 5-6: Flood Zones



Source: Indian River County GIS. FEMA Flood Areas and Special Flood Hazard Areas with an effective date of 12/4/2012 for Indian River County, Florida. Base Flood Elevations (BFE's) specified using the North American Vertical Datum of 1988 (NAVD88). FEMA Version of 8/31/2017



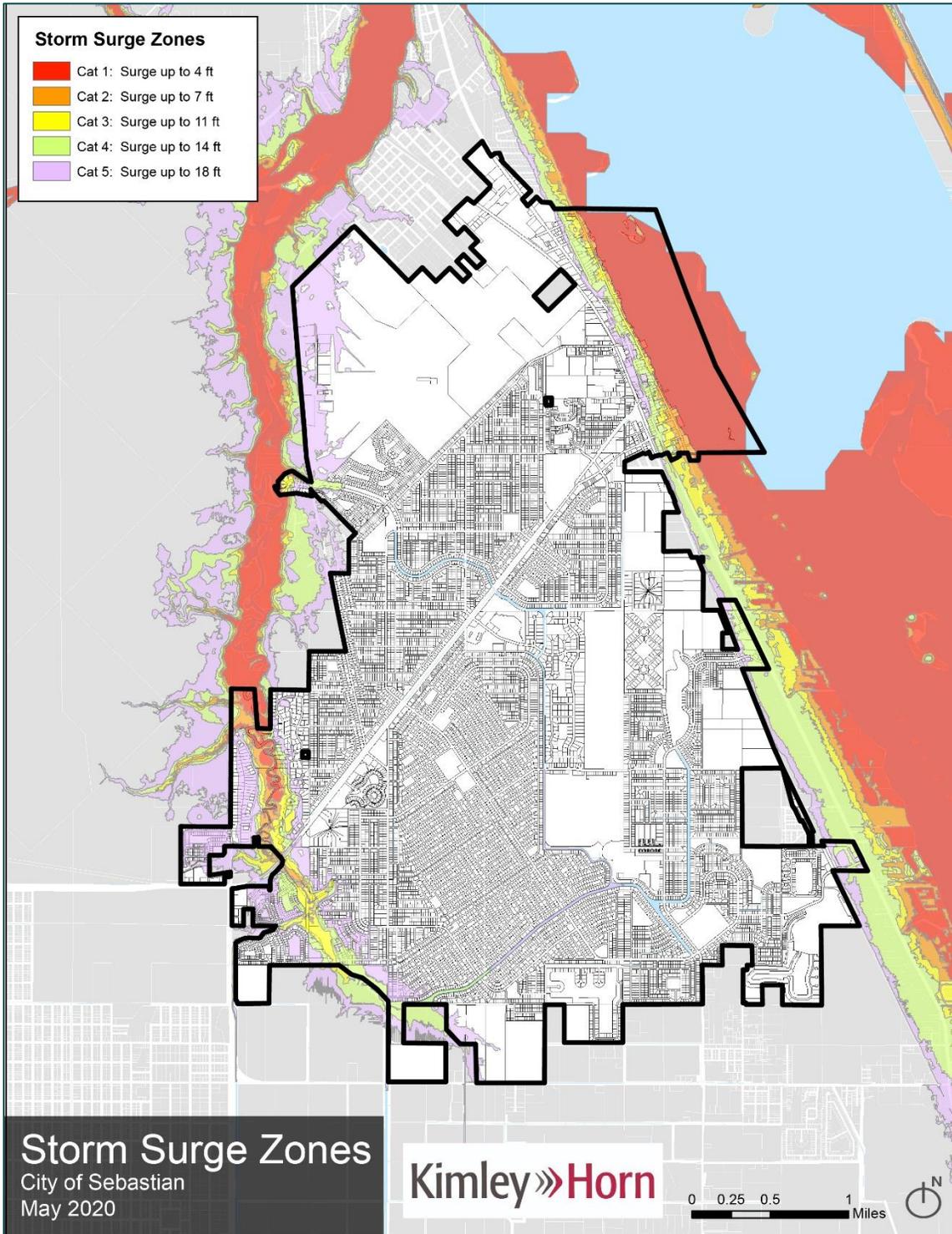
Map 5-7: Coastal High Hazard Area (CHHA)



Source: Treasure Coast Region Florida Statewide Regional Evacuation Study Program for Indian River, Martin, Palm Beach, and St. Lucie Counties, Treasure Coast Regional Planning Council, 2010



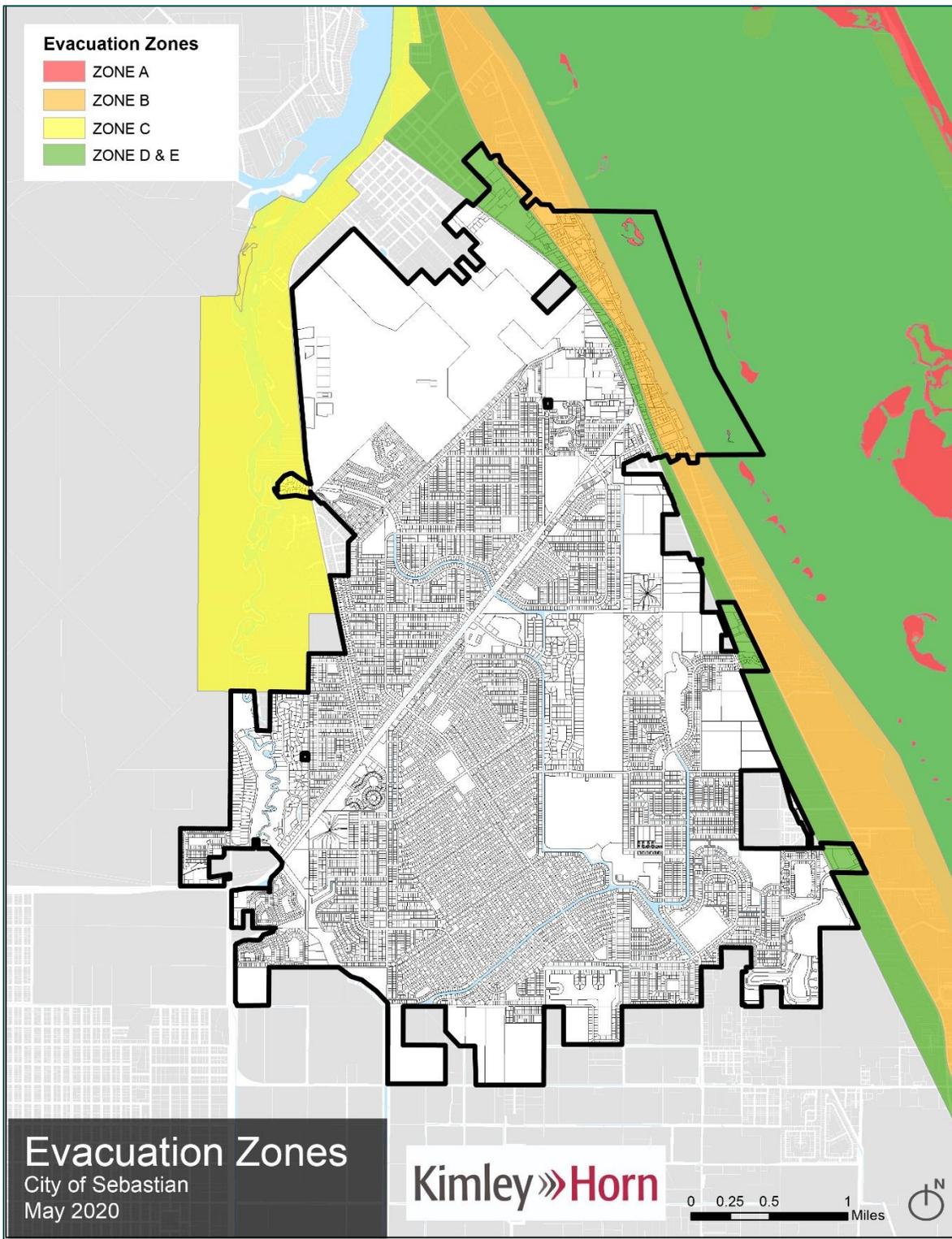
Map 5-8: Storm Surge Zones



Source: Treasure Coast Region Florida Statewide Regional Evacuation Study Program for Indian River, Martin, Palm Beach, and St. Lucie Counties, Treasure Coast Regional Planning Council, 2010



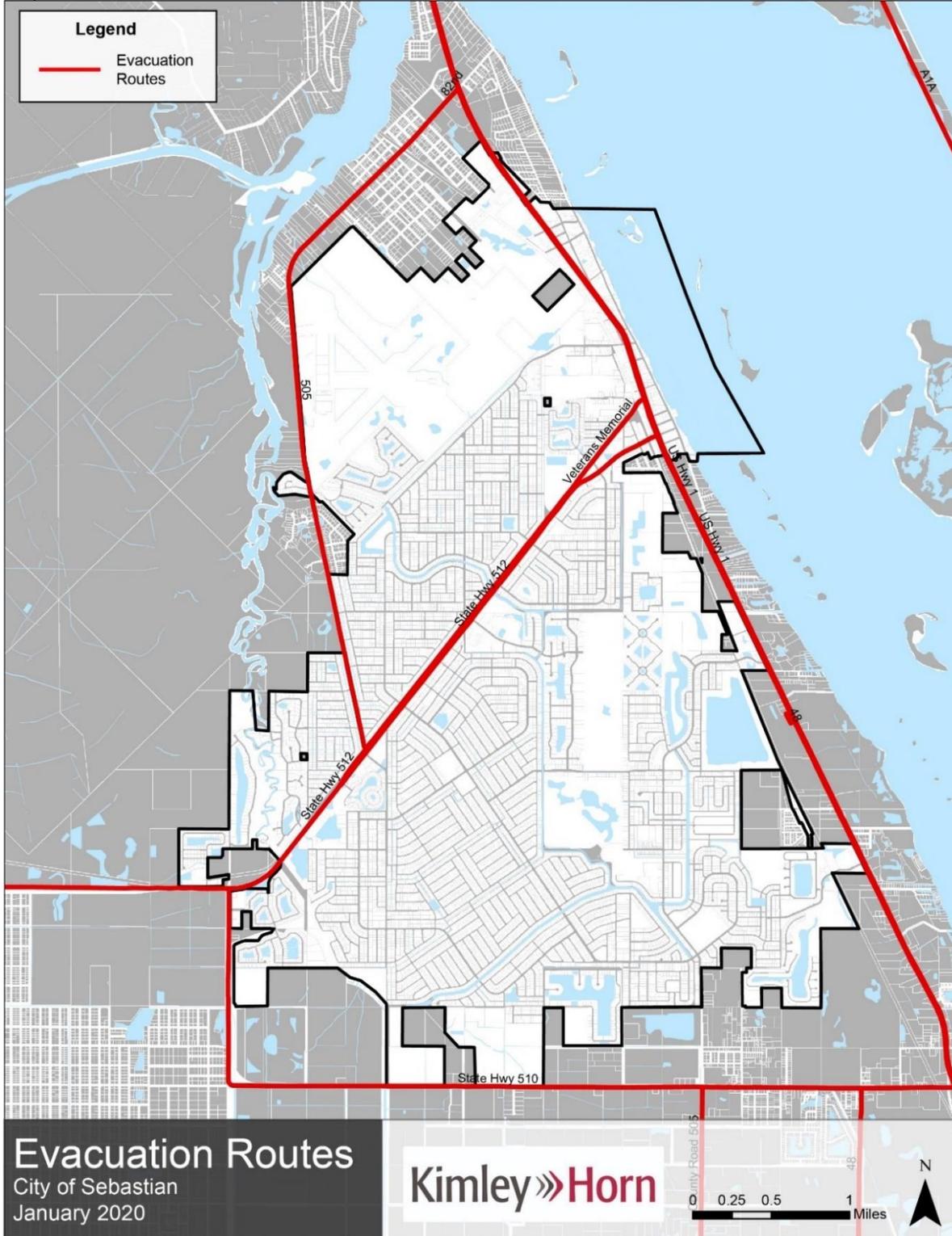
Map 5-9: Hurricane Evacuation Zones



Source: Indian River County Emergency Management



Map 5-10: Evacuation Routes



Source: Florida Division of Emergency Management