

**Table 12-20. Identification of Management Options for Hydrologic Alterations for the Estero Bay Basin.**

Management Option	Issues Addressed	Mode of Operation	Constraints to Implementing	Potential Benefits	Geographic Area of Use
5) Increase stormwater runoff storage near coast	Hydrologic alteration	Surface water is stored and gradually released	Cost, land requirements	Ensures stable, natural freshwater inflows for coastal estuary.	Coastal and inland areas
6) Provide for sheet flow of surface water past roads and utility corridors	Urban infrastru. - roads & utility corridors; Wetlands to urban; Uplands to urban	Improves surface water flow patterns and rates	Cost, regulatory/enforcement	Improved surface water flow regime	Basin-wide
7) Re-establish hydrologic connection for mined areas	Shell and fill mining	Increases areas that contribute stormwater runoff to estuary	Physical, cost	Improve freshwater inflows to estuary	Basin-wide
8) Identify and correct significant and unnecessary inter-basin transfers	Inter-basin transfer of water	Route surface water and ground-water to natural outfalls	Cost, land requirements	Improved freshwater inflow characteristics (ie. Imperial River)	Inland basins and coastal outfalls

**Table 12-20. Identification of Management Options for Hydrologic Alterations for the Estero Bay Basin.**

Management Option	Issues Addressed	Mode of Operation	Constraints to Implementing	Potential Benefits	Geographic Area of Use
9) Determine and achieve minimum flows and levels for freshwater systems	Hydrologic alteration; Urban and agri. water supply	Determine optimal range, timing, and levels surface water, and groundwater systems	Cost, technical analysis	Re-establishing acceptable freshwater inflow rates to estuary	Basin-wide

**Table 12-21. Identification of Management Options for Habitat Loss for the Estero Bay Basin.**

Management Option	Issues Addressed	Mode of Operation	Constraints to Implementing	Potential Benefits	Geographic Area of Use
1) Develop and implement Master Plan for habitat protection and restoration	Wetlands and uplands to agriculture and urban; Hydrologic alter.	Coordinated Master Plan will make habitat enhancement efforts more effective	Cost, regulatory format	Improved habitat in Charlotte Harbor and watershed	Basin-wide, or estuary only
2) Establish and implement mitigation criteria	Wetlands and uplands to agriculture and urban; Hydrologic alter.	Developing criteria will improve habitat protection and enhancement	Cost, regulatory format, public and private acceptance	Improved habitat in Charlotte Harbor and watershed	Basin-wide, or estuary only
3) Manage public access to coastal areas		Management will limit impacts to habitats	Cost, enforcement, public acceptance	Reduced impacts to shoreline and estuarine resources	Coastal areas
4) Increase level of reuse for landscape irrigation	Wetlands to urban and agriculture	Reuse reduces additional demands on freshwater, and reduces nutrient loading	Reuse distribution system, social (public acceptance)	Reduces demands on potable water, which reduces potential impacts to natural systems	Basin-wide

**Table 12-21. Identification of Management Options for Habitat Loss for the Estero Bay Basin.**

Management Option	Issues Addressed	Mode of Operation	Constraints to Implementing	Potential Benefits	Geographic Area of Use
5) Encourage waterfront property owners to enhance shoreline habitats	Wetland to urban land use	Shoreline enhancement will improve habitat values	Public awareness, cost	Improved habitat values for estuary	Coastal areas
6) Investigate alternate water sources such as desalinization	Over-use of surface and ground water	Process sea water into potable water through physical and chemical means	Public acceptance, cost	Reduces potential impacts to natural systems from over use as potable source	Basin-wide
7) Re-establish more natural annual flow hydrographs in coastal streams	Hydrologic alteration	Return coastal streams to more natural systems	Cost, land requirements	Ensures stable, natural rates of freshwater inflow for estuarine living resources.	Coastal areas and tidal creeks
8) Establish greenways and wildlife corridors between large natural areas	Wetlands to urban and agriculture; Uplands to urban and agriculture; Low density to high density land use	Provides upland and wetland connections between large natural habitat areas	Cost, land availability	Provides contiguous system of uplands and wetlands for habitat	Basin-wide

**Table 12-21. Identification of Management Options for Habitat Loss for the Estero Bay Basin.**

Management Option	Issues Addressed	Mode of Operation	Constraints to Implementing	Potential Benefits	Geographic Area of Use
9) Identify and protect areas subject to prop scarring	Rec. and comm. boating; Rec. and comm. fishing	Reduces impacts to seagrass meadows by limiting motor boat access to areas	Cost, regulatory/enforcement, public acceptance	Improves quality of estuarine habitat	Within Charlotte Harbor
10) Provide protection for manatees in areas of their congregation	Rec. and comm. boating; Rec. and comm. fishing	Reduces manatee mortality by slowing boats or limiting access to some areas	Cost, regulatory/enforcement, public acceptance	Reduced manatee mortality	Within Charlotte Harbor and coastal canals and streams
11) Determine and achieve minimum flows and levels for freshwater systems	Hydrologic alteration; Urban and agri. water supply	Determine optimal range, timing, and levels surface water, and groundwater systems	Cost, technical analysis	Improving habitat values for living resources of the estuary	Basin-wide

**Table 12-22. Identification of Management Options for Water Quality for the Coastal Venice Basin.**

Management Option	Issues Addressed	Mode of Operation	Constraints to Implementing	Potential Benefits	Geographic Area of Use
1) Enhance circulation in residential canals	Urban infrastru. - canals; Stormwater runoff	Flushing improves water quality	Physical (right-of-way requirements), social	Increased water quality in coastal residential areas.	Coastal lands and tidal river reaches
2) Provide treatment for runoff from developed public lands	Urban infrastru. - roads and bridges; Stormwater runoff	Treatment improves stormwater quality from roads, other public lands	Financial, physical (land requirements)	Decreased pollutant loadings from stormwater	Basin-wide
3) Provide vegetated buffers adjacent to estuary	Stormwater runoff; Wetland to urban land use	Buffers will filter runoff prior to entering estuary	Regulatory (rules not in place or not enforced)	Decreased pollutant loadings from stormwater	Coastal fringe and along tidal creeks
4) Improve circulation through passes and causeways	Urban infrastru. - roads/bridges; Shoreline alteration; Dredging	Flushing improves water quality in estuary	Physical (right-of-way requirements), social	Increased water quality in coastal areas	Coastal lands and tidal river reaches

**Table 12-22. Identification of Management Options for Water Quality for the Coastal Venice Basin.**

Management Option	Issues Addressed	Mode of Operation	Constraints to Implementing	Potential Benefits	Geographic Area of Use
5) Promote Florida Yards & Neighbor. measures for source reduction for residences, businesses, and public property	Stormwater Runoff	Reducing irrigation, fertilization and pesticide applic. decreases loadings from urban lands.	Lack of public knowledge	Decreased nutrient and contaminant loadings from residential areas	Basin-wide
6) Investigate atmospheric deposition's role in surface water quality	Atmospheric deposition; Stormwater runoff	Atm. deposition contributes to nutrient and contaminant loading from runoff	Cost, technical analysis	Identifying atm. dep.'s role in water quality will allow management options to be developed.	Basin-wide
7) Promote energy conservation	Atmospheric deposition	Using less energy reduces stationary and mobile air emissions	Cost, public and industry acceptance, technical	Reduced atm. dep. contribution to water quality impacts	Basin-wide
8) Increase level of reuse for landscape irrigation	Stormwater runoff;	Reuse reduces landscape nutrient loading needs	Reuse distribution system, social (public acceptance)	Decreases fertilizer contribution to nutrient loading	Basin-wide

**Table 12-22. Identification of Management Options for Water Quality for the Coastal Venice Basin.**

Management Option	Issues Addressed	Mode of Operation	Constraints to Implementing	Potential Benefits	Geographic Area of Use
9) Ensure that current monitoring of WWTP effluent disposal is adequate	Point source discharges	Monitoring should be adequate to indicate water quality problems	Cost, WWTP operators' acceptance	Reduced water quality impacts from WWTP	Basin-wide
10) Extend sanitary sewer to coastal areas now served by septic tanks	Groundwater contamination	Removing wastewater effluent from coastal areas reduces chances of water quality impacts	Cost, public acceptance	Reduced nutrient and contaminant loading from septic tanks	Coastal areas and near other surface water bodies
11) Develop program to monitor septic tank operation and efficiency		Improved monitoring will reduce potential for impacts from septic tanks	Cost, public acceptance	Improvements in septic tank operations and efficiency	Basin-wide
12) Promote integrated pest management (IPM) for landscaping	Stormwater runoff, uplands to agriculture	IPM reduces amount of pesticide applied to land	Education efforts, farmers' and landscapers' acceptance	Reduced contaminants in stormwater	Basin-wide

**Table 12-22. Identification of Management Options for Water Quality for the Coastal Venice Basin.**

Management Option	Issues Addressed	Mode of Operation	Constraints to Implementing	Potential Benefits	Geographic Area of Use
13) Reduce unnecessary paved surfaces	Stormwater runoff; wetland and upland to urban land use	Reduced pavement reduces runoff quantity and improves quality	Cost, regulatory/enforcement	Improved surface water quality from urban runoff	Basin-wide
14) Promote compact urban growth	Wetland and upland to urban land use; stormwater runoff	Minimizing urban sprawl reduces spatial extent of impact	Regulatory, public acceptance	Reduced extent of water quality impacts	Basin-wide
15) Develop Master Plan for Spill Response	Rec. and comm. boating	Master Plan would reduce impacts from spill	Cost, public, government, and private participation	Reduced impacts from spills in harbor	Coastal areas in within harbor
16) Improve boat head and bilge pumping, and refueling practices	Rec. and comm. boating	Pump heads/bilges to appropriate destination, use spill-reducing fueling methods	Cost, public acceptance	Reduction of human waste and contaminants to surface waters	Coastal lands, within harbor

**Table 12-22. Identification of Management Options for Water Quality for the Coastal Venice Basin.**

Management Option	Issues Addressed	Mode of Operation	Constraints to Implementing	Potential Benefits	Geographic Area of Use
17) Coordinate water quality monitoring programs		Coordinated monitoring will better characterize surface and groundwater	Cost	Better understanding of trends in water quality in basin	Basin-wide

**Table 12-23. Identification of Management Options for Hydrologic Alterations for the Coastal Venice Basin.**

Management Option	Issues Addressed	Mode of Operation	Constraints to Implementing	Potential Benefits	Geographic Area of Use
1) Increase level of reuse for landscape irrigation	Urban water supply	Reuse reduces additional water use and nutrient loading	Reuse distribution system, social (public acceptance)	Reduces demands on potable water.	Basin-wide
2) Promote use of water-saving appliances and fixtures	Urban water supply	Reduces rate of potable water use	Public acceptance, distribution of hardware	Reduces per capita potable water use	Basin-wide
3) Investigate alternate sources such as desalination	Urban water supply	Process sea water into potable water through physical and chemical means	Public acceptance, cost	Reduces demands on groundwater and surface water for potable use	Mainly coastal areas
4) Re-establish more natural annual flow hydrographs in coastal streams	Hydrologic alteration	Return coastal streams to more natural systems	Cost, land requirements	Ensures stable, natural freshwater inflows for coastal estuary.	Coastal and inland areas

**Table 12-23. Identification of Management Options for Hydrologic Alterations for the Coastal Venice Basin.**

Management Option	Issues Addressed	Mode of Operation	Constraints to Implementing	Potential Benefits	Geographic Area of Use
5) Increase stormwater runoff storage near coast	Hydrologic alteration	Surface water is stored and gradually released	Cost, land requirements	Ensures stable, natural freshwater inflows for coastal estuary.	Coastal and inland areas
6) Provide for sheet flow of surface water past roads and utility corridors	Urban infrastru. - roads & utility corridors; Wetlands to urban; Uplands to urban	Improves surface water flow patterns and rates	Cost, regulatory/enforcement	Improved surface water flow regime	Basin-wide
7) Identify and correct significant and unnecessary inter-basin transfers	Inter-basin transfer of water	Route surface water and ground-water to natural outfalls	Cost, land requirements	Improved freshwater inflow characteristics	Inland basins and coastal outfalls

**Table 12-24. Identification of Management Options for Habitat Loss for the Coastal Venice Basin.**

Management Option	Issues Addressed	Mode of Operation	Constraints to Implementing	Potential Benefits	Geographic Area of Use
1) Develop and implement Master Plan for habitat protection and restoration	Wetlands and uplands to agriculture and urban; Hydrologic alter.	Coordinated Master Plan will make habitat enhancement efforts more effective	Cost, regulatory format	Improved habitat in Charlotte Harbor and watershed	Basin-wide, or estuary only
2) Establish and implement mitigation criteria	Wetlands and uplands to agriculture and urban; Hydrologic alter.	Developing criteria will improve habitat protection and enhancement	Cost, regulatory format, public and private acceptance	Improved habitat in Charlotte Harbor and watershed	Basin-wide, or estuary only
3) Manage public access to coastal areas	Wetland to urban land use	Management will limit impacts to habitats	Cost, enforcement, public acceptance	Reduced impacts to shoreline and estuarine resources	Coastal areas
4) Increase level of reuse for landscape irrigation	Wetlands to urban and agriculture	Reuse reduces additional demands on freshwater, and reduces nutrient loading	Reuse distribution system, social (public acceptance)	Reduces demands on potable water, which reduces potential impacts to natural systems	Basin-wide

**Table 12-24. Identification of Management Options for Habitat Loss for the Coastal Venice Basin.**

Management Option	Issues Addressed	Mode of Operation	Constraints to Implementing	Potential Benefits	Geographic Area of Use
5) Encourage waterfront property owners to enhance shoreline habitats	Wetland to urban land use	Shoreline enhancement will improve habitat values	Public awareness, cost	Improved habitat values for estuary	Coastal areas
6) Investigate alternate water sources such as desalinization	Over-use of surface and ground water	Process sea water into potable water through physical and chemical means	Public acceptance, cost	Reduces potential impacts to natural systems from over use as potable source	Basin-wide
7) Re-establish more natural annual flow hydrographs in coastal streams.	Hydrologic alteration	Return coastal streams to more natural systems	Cost, land requirements	Ensures stable, natural rates of freshwater inflow for estuarine living resources.	Coastal areas and tidal creeks
8) Establish greenways and wildlife corridors between large natural areas	Wetlands to urban and agriculture; Uplands to urban and agriculture; Low density to high density land use	Provides upland and wetland connections between large natural habitat areas	Cost, land availability	Provides contiguous system of uplands and wetlands for habitat	Basin-wide

**Table 12-24. Identification of Management Options for Habitat Loss for the Coastal Venice Basin.**

Management Option	Issues Addressed	Mode of Operation	Constraints to Implementing	Potential Benefits	Geographic Area of Use
9) Identify and protect areas subject to prop scarring	Rec. and comm. boating; Rec. and comm. fishing	Reduces impacts to seagrass meadows by limiting motor boat access to areas	Cost, regulatory/enforcement, public acceptance	Improves quality of estuarine habitat	Within Charlotte Harbor
10) Provide protection for manatees in areas of their congregation	Rec. and comm. boating; Rec. and comm. fishing	Reduces manatee mortality by slowing boats or limiting access to some areas	Cost, regulatory/enforcement, public acceptance	Reduced manatee mortality	Within Charlotte Harbor and coastal canals and streams
11) Assess cumulative impacts of entrainment of living resources of estuary	Wetlands to urban land use	Determine how many living resources are killed through entrainment	Cost, industry participation	Better understanding of impacts of entrainment	Coastal areas