

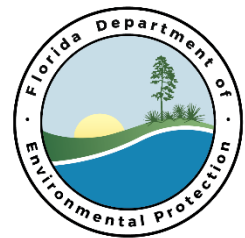
2018 Update to the Florida Keys Reasonable Assurance Document

**Division of Environmental Assessment and Restoration
Water Quality Assessment Program
Florida Department of Environmental Protection**

with participation from the
Florida Keys Stakeholders

June 2018

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Acknowledgments

The Florida Department of Environmental Protection adopted the *2018 Update to the Florida Keys Reasonable Assurance Document (FKRAD)* by Secretarial Order as part of its statewide watershed management approach to restore and protect Florida's water quality. The update was developed in coordination with stakeholders, identified below, with participation from affected local, regional, and state governmental interests; elected officials and citizens; and private interests.

Florida Department of Environmental Protection

Noah Valenstein, Secretary

Table Ack-1. FKRAD Update Participants

Type of Entity	Name
Responsible Stakeholders	City of Key Colony Beach City of Key West City of Layton City of Marathon DEP Florida Park Service Key Largo Wastewater Treatment District Monroe County U.S. Navy Village of Islamorada
Responsible Agencies	Florida Department of Environmental Protection Florida Department of Transportation Florida Department of Health
Other Interested Stakeholders	Citizens Florida Department of Economic Opportunity, Division of Community Planning Florida Fish and Wildlife Conservation Commission Florida International University Florida Keys Environmental Fund Florida Sea Grant National Oceanic and Atmospheric Administration Florida Keys National Marine Sanctuary U.S. Environmental Protection Agency

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List of Acronyms and Abbreviations

µg/l	Micrograms Per Liter
ACSC	Area of Critical State Concern
AWRF	Advanced Wastewater Reclamation Facility
AWT	Advanced Wastewater Treatment
BAT	Biologically Accelerated Treatment
CMMP	Canal Management Master Plan
CRWS	Cudjoe Regional Wastewater System
DEP	Florida Department of Environmental Protection
DIN	Dissolved Inorganic Nitrogen
DO	Dissolved Oxygen
EDU	Equivalent Dwelling Unit
EPA	U.S. Environmental Protection Agency
F.A.C.	Florida Administrative Code
FDOH	Florida Department of Health
FDOT	Florida Department of Transportation
FKAA	Florida Keys Aqueduct Authority
FKNMS	Florida Keys National Marine Sanctuary
FKRAD	Florida Keys Reasonable Assurance Document
FWRA	Florida Watershed Restoration Act
IWR	Impaired Waters Rule
KLWTD	Key Largo Wastewater Treatment District
lbs/yr	Pounds Per Year
mg/l	Milligrams Per Liter
mgd	Million Gallons Per Day
MM	Mile Marker
NELAC	National Environmental Laboratory Accreditation Conference
NELAP	National Environmental Laboratory Accreditation Program
NO _x	Nitrate
OFW	Outstanding Florida Water
OSTDS	Onsite Sewage Treatment and Disposal System
QA/QC	Quality Assurance/Quality Control
RA	Reasonable Assurance
RESTORE	Resources and Ecosystems Sustainability, Tourist Opportunities, and Revived Economies of the Gulf Coast States Act
SOP	Standard Operating Procedure
STORET	Storage and Retrieval (Database)
TKN	Total Kjeldahl Nitrogen
TMDL	Total Maximum Daily Load
TN	Total Nitrogen
TP	Total Phosphorus
WBID	Waterbody Identification (Number)
WIN	Watershed Information Network
WQPP	Water Quality Protection Plan
WWTF/WWTP	Wastewater Treatment Facility/Plant

Executive Summary

Summary

In 2008 the Florida Keys Reasonable Assurance Documentation (FKRAD) to address nutrients was approved by the Florida Department of Environmental Protection (DEP or department) and was provided to the U.S. Environmental Protection Agency (EPA) in February 2009. The original FKRAD was based, partly, on compliance with Chapter 99-395, Laws of Florida (LOF), which mandated compliance with wastewater treatment requirements by June 2010 and an overall completion date of the management actions by 2020. However, in 2010, Chapter 2010-205, LOF, extended the wastewater treatment compliance date to December 2015. This document provides an update on the status of the management activities defined in the original FKRAD and as well as an update of dissolved oxygen (DO) impairments in some waterbody identification (WBID) segments that were identified as impaired in the previous assessment cycle.

Management Activities Status

Since 2011, an additional 42 water quality restoration projects have been completed. The status of each project along and a list of new projects are provided in **Appendix A**. Most of the listed wastewater and stormwater projects have been completed as of this update and are identified as “completed.” However, there are several projects remaining that are designated as “planned” that are scheduled to be completed by 2020.

Water Quality Assessment Status

The waters of the Florida Keys were assessed and updated during 2017 and 2018 as part of the DEP watershed management cycle. The Florida Keys are part of the Group 5 basins that were scheduled to be assessed as part of the 5-year cycle in 2017, with a final order adopted by the secretary in 2018. All of the WBIDs remain in assessment category 4b, indicating there is a reasonable assurance (RA) plan in place to address nutrient impairments. Additionally, there has been a change in the DO assessment status of the WBIDs. In 2013, DEP adopted new DO criteria that changed the assessment units from milligrams per liter (mg/L) to percent saturation. Assessment of the waterbodies under the new criteria resulted in some changes to the assessments in the previous cycle. Several waterbodies have insufficient data, some are no longer impaired, and one area remains impaired.

Although the majority of the restoration projects in the initial plan have been implemented, more monitoring is needed to assess the results of these restoration activities. DEP and Monroe County are working together to establish a new monitoring program that will focus on the water quality in the near shore waters. This program will continue for two years and results will be reported in an update of the FKRAD due in 2020.

Section 1: Background

1.1 Purpose of the Update

The Impaired Waters Rule (IWR), Chapter 62-303, Florida Administrative Code (F.A.C.), establishes a scientific methodology for identifying surface waters in Florida that are impaired for pollutants. DEP assesses available water quality data for each surface waterbody in Florida at least once every five years. The surface waterbodies that are included in the Florida Keys Reasonable Assurance Document (FKRAD) are in a Group 5 basin; the most recent assessment was completed in 2017. This FKRAD update demonstrates reasonable assurance to the U.S. Environmental Protection Agency (EPA) that pollution control mechanisms will result in attainment of water quality standards in the future, thereby eliminating the establishment of a total maximum daily load (TMDL) for the FKRAD waterbodies.

The purpose of this update is to document actions taken by stakeholders since 2011 (date of last update) to return the near shore water quality to the nutrient target concentrations. This update also addresses the dissolved oxygen (DO) impairment identified by the Florida Department of Environmental Protection (DEP) in some of the water segments; includes a revised approach to monitoring and reporting results; and identifies the schedule to meet water quality targets and restoration goals.

1.2 Reasonable Assurance Planning Process

The IWR authorizes two types of restoration plans that avoid placement of a waterbody on the Verified List (list of waters that are confirmed to be impaired as a result of a pollutant and require the establishment of a TMDL): 1) Assessment category 4b plans also known as "reasonable assurance plans"; and 2) Assessment category 4e plans. The difference between a 4b plan and a 4e plan relates to the level of certainty when water quality standards will be met in the future. For 4b plans, there is reasonable assurance that pollution control mechanisms will result in attainment of water quality standards in the future and reasonable progress towards attainment of water quality standards will be made by the time the next 303(d) list that includes the basin of the affected waterbodies, is scheduled to be submitted to EPA. As such, establishment of a TMDL is unnecessary. For 4e plans, the waterbody is still included on the 303(d) list, but placement on the Verified List is postponed, to allow for implementation of the 4e plan and evaluation of progress towards restoration.

The original FKRAD was developed by DEP as a 4b plan in cooperation with local governments, state agencies, and federal agencies within the Florida Keys to set forth and accelerate the actions that had been taken or were planned to be taken to specifically reduce nutrient loadings to near shore waters so that water quality standards are met and beneficial uses are restored. The original FKRAD was not developed to address DO impairments. The original plan was approved by DEP in 2008 and provided to EPA in February 2009. The FKRAD was divided into several documents and can be found on the DEP website. This update addresses the nutrient impairments as a 4b plan and the DO impairments as a 4e plan.

1.3 Geographic Boundaries of the FKRAD

The Florida Keys is a chain of 822 islands (30 of which are inhabited) approximately 110 miles long, extending from the end of the Florida peninsula, curving southwest toward the Dry Tortugas. All the waters adjacent to the islands are designated as Outstanding Florida Waters (OFWs), including the Florida Keys National Marine Sanctuary (FKNMS), the largest national marine sanctuary in the U.S. The Florida Keys is also a designated an Area of Critical State Concern (ACSC).

The FKRAD is comprised of 23 estuarine waterbody assessment units identified by a series of numbers and letters (waterbody identifications [WBIDs]) within the Halo Zone waters (up to 500 meters offshore). **Table 1** identifies the 23 WBIDs by name, location, and stakeholder. Each WBID is impaired for nutrients; the one WBID shaded in gray is also impaired for DO per the 2017 assessment of the Group 5 basins. Of the 23 listed, only 11 had sufficient data to be assessed for DO, many of which are not impaired assessing against the new DO criterion which was adopted in 2013. **Figure 1** identifies the boundaries associated with each WBID.

Table 1. WBIDs with impairments in the Florida Keys

Note: Gray shading denotes WBIDs impaired for DO, in addition to nutrient impairment.

WBID	Waterbody Name	Location	Stakeholders in WBID
6006A	South Key Largo	Northern Keys	Key Largo Wastewater Treatment District (KLWTD) Florida Department of Transportation (FDOT)
6006B	Middle Key Largo	Northern Keys	KLWTD Monroe County FDOT
6006C	Upper Key Largo	Northern Keys	Monroe County FDOT
6009	Plantation Keys	Northern Keys	Village of Islamorada FDOT
6010	Long Key	Central Keys	City of Layton Monroe County FDOT
6011A	Vaca Key	Central Keys	City of Marathon FDOT
6011B	Key Colony	Central Keys	City of Key Colony Beach FDOT
6011C	Grassy Key	Central Keys	City of Marathon FDOT
6012A	Big Pine Key	South Central Keys	Monroe County FDOT
6012C	No Name Key	South Central Keys	Monroe County FDOT
6012D	Long Beach	South Central Keys	Monroe County FDOT
6012E	Big Torch Key	Central Keys	Monroe County FDOT
6013A	Saddlebunch Keys	South Central Keys	Monroe County FDOT
6013B	Sugarloaf	South Central Keys	Monroe County

WBID	Waterbody Name	Location	Stakeholders in WBID
			FDOT
6013C	Cudjoe Key	South Central Keys	Monroe County FDOT
6013D	Little Knockemdown Key	South Central Keys	Monroe County FDOT
6014A	Key West	Southern Keys	City of Key West U.S. Navy FDOT
6014B	Stock Island	Southern Keys	Monroe County FDOT
6014C	U.S. Naval Air Station Key West	South Central Keys	U.S. Navy Monroe County FDOT
6016	Duck Key	Central Keys	DEP Florida Park Service Monroe County FDOT
6017	Upper Matecumbe Key	Northern Keys	DEP Florida Park Service Village of Islamorada FDOT
6018	Bahia Honda State Park	South Central Keys	DEP Florida Park Service Monroe County FDOT
6019	Lower Matecumbe Key	Northern Keys	Village of Islamorada FDOT

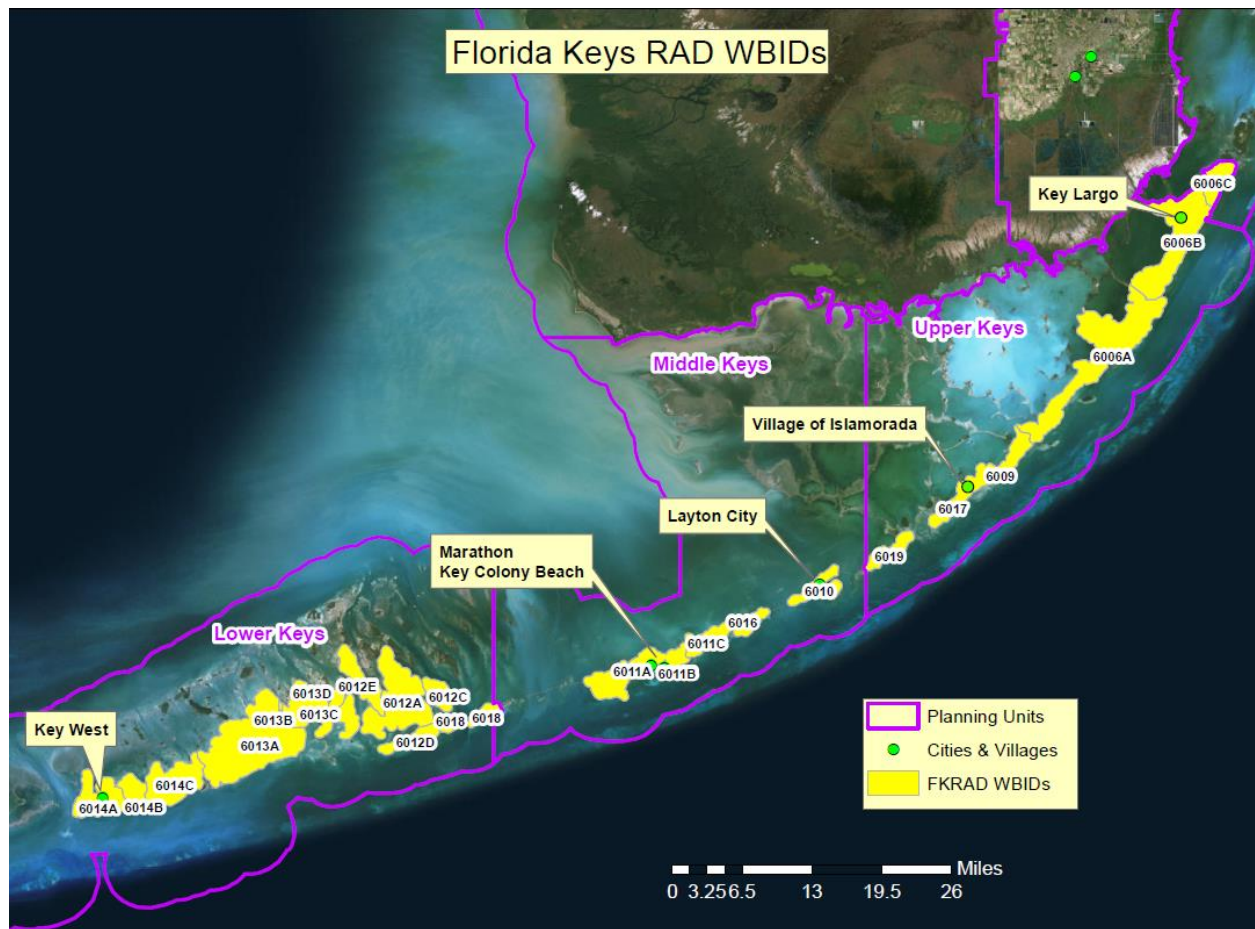


Figure 1. WBIDs with impairments in the Florida Keys

1.4 Stakeholder Involvement

A stakeholder-involved process was implemented during preparation of the original FKRAD. The stakeholder process provided an opportunity for local, regional, state, and federal agencies, as well as third parties, to understand the reasonable assurance process; provide data and research input in the development of the FKRAD; and confirm that the FKRAD reasonably expressed the commitments of stakeholders. A technical working group was established to obtain information on existing and pending stakeholder programs to document regional water quality management actions that would provide reasonable assurance that programs would meet identified goals for restoring impaired waterbodies.

The following entities executed stakeholder agreements to manage local anthropogenic nutrient contributions, and to control loadings generated by local wastewater and stormwater discharges to the extent practicable:

- City of Key Colony Beach.
- City of Key West.

- City of Layton.
- City of Marathon.
- Key Largo Wastewater Treatment District (KLWTD).
- Monroe County.
- Village of Islamorada.

The following entities provided letters of commitment to implement pollutant controls within their jurisdictions:

- DEP Florida Park Service.
- Florida Department of Transportation (FDOT).
- U.S. Navy.

Table Ack-1 on page 2 identifies the entities that provided contributions to this update.

Section 2: Impaired Waterbodies

2.1 Description of the Impaired Waterbodies and Pollutants of Concern

The Florida Keys are a linear collection of small watersheds which are hydrologically connected at the local level by near shore waters. Nuances within the Florida Keys are the following:

- Water quality in the near shore waters is affected by far field sources that are a combination of naturally occurring nutrient loads and anthropogenic sources located outside of the Florida Keys.
- Far field sources are not within the control of the stakeholders.
- Water quality in the Halo Zone is incrementally affected by a combination of natural stormwater discharges originating on undeveloped areas and anthropogenic discharges from developed land with loads attributable to wastewater and stormwater management practices from developed properties.
- Water quality in the Halo Zone, to a much lesser degree, is also incrementally affected by nutrients discharged via stormwater from existing natural areas.

For the purposes of the FKRAD, the focus is on the near shore waters at the Halo Zone (within 500 meters of shore), not including the canals¹. These WBIDs are Class III waters (used for recreation, propagation and maintenance of a healthy, well-balanced population of fish and wildlife) and OFWs. **Table 1** identifies the 23-impaired estuarine WBIDs in order of location. The length of the impaired waters based on location are below:

- Northern Keys – A series of islands approximately 32 miles long by 2 miles wide.
- Central Keys – A series of islands approximately 22 miles long by 2 miles wide.
- South Central Keys – A series of islands approximately 23 miles long by about 6 miles at the widest point.
- Southern Keys – A series of islands approximately 6 miles long by 2 miles wide.

All 23 WBIDs are impaired for nutrients and are in assessment category 4b (reasonable assurance plan in place addresses impairment). One WBID (WBID 6016) is also impaired for DO; DEP retained this WBID in assessment category 4e (ongoing restoration activities) because

¹ December 2008. Northern Keys Area Reasonable Assurance Documentation. Page 3-4. Tallahassee, FL. Florida Department of Environmental Protection.

there are ongoing restoration activities that will address the role nutrients play in the DO impairment and there are insufficient nutrient data available to determine a causative pollutant. The 2013 Monroe County Canal Management Master Plan (CMMP) indicates there are more than 500 canals within the WBIDs of which potentially more than 300 have fair or poor DO conditions. However, with a revision to the DEP DO criteria in 2013 and a re-evaluation of the canals, there are now 149 canals that have a fair or poor DO condition. These monitoring data represent a “snap shot of the water quality of the canals.” It is recommended that a canal monitoring program be instituted that more comprehensively characterizes the water quality of the canals over time to further assist with the prioritization of water quality restoration projects.

Section 3: Water Quality and Aquatic Ecologic Goals

3.1 Water Quality Targets

The applicable nutrient water quality standard for the impaired waters in the FKRAD is the narrative criterion defined in Paragraph 62-302.530(47)(b), F.A.C: In no case shall nutrient concentrations of a waterbody be altered so as to cause an imbalance of natural populations of flora and fauna.

Two sets of nutrient targets were supported in the original FKRAD. The first target is an insignificant increase in concentration above natural background within 500 meters of the shoreline (Halo Zone). "Insignificant" is defined as less than 10 micrograms per liter ($\mu\text{g/L}$) above background for total nitrogen (TN) and 2 $\mu\text{g/L}$ above background for total phosphorus (TP)². "Background" is defined as the Halo Zone condition in the absence of anthropogenic loads. The second target is based on the OFW designation, with the target set at the average of values measured at the near shore (500 meters to 12,100 meters from the shoreline) ambient nutrient concentrations during the year (1985) the Florida Keys were designated as an OFW³.

These lines of evidence are different than the water quality targets identified in the FKNMS Water Quality Protection Plan (WQPP). **Table 2a** through **Table 2d** are comparisons of the targets in the FKRAD to the WQPP targets. As additional water quality data are collected in the Halo Zone, achievement of the targets will be reviewed.

² December 2008. Northern Keys Area Reasonable Assurance Documentation. Page 3-4. Tallahassee, FL. Florida Department of Environmental Protection.

³ December 2008. Northern Keys Area Reasonable Assurance Documentation. Page 3-5. Tallahassee, FL. Florida Department of Environmental Protection.

Table 2a. Comparison of water quality targets in the Southern Keys Area

Notes:

- The FKRAD target for the Halo Zone is defined as "an insignificant increase above natural background (an increase of < 10 µg/l TN and < 2 µg/l TP)" by model area. Since each geographic location has several model areas, for simplicity, the target range is provided below rather than target per model area (see Figure 2).
- The FK OFW target is defined as the average concentration in 1985 of the bayside and oceanside waters.
- The FKNMS WQPP targets are from the *2009 Annual Report of the Water Quality Monitoring Project for the Water Quality Protection Program of the Florida Keys National Marine Sanctuary* (FIU, 2010). Micromole units were converted to µg/l. DIN is dissolved inorganic nitrogen.

Sub-area within the Southern Keys	FKRAD TN Target Range (µg/l)	FK OFW TN Target (µg/l)	FKNMS WQPP DIN Target (µg/l)	FKRAD TP Target Range (µg/l)	FK OFW TP Target (µg/l)	FKNMS WQPP TP Target (µg/l)
Model Areas	142-179			8-11		
Bayside		370			14	
Oceanside		288			15	
Near Shore and Coastal Waters			≤ 10			≤ 7.7

Table 2b. Comparison of water quality targets in the South-Central Keys Area

Notes:

- The FKRAD target for the Halo Zone is defined as "an insignificant increase above natural background (an increase of < 10 µg/l TN and < 2 µg/l TP)" by model area. Since each geographic location has several model areas, for simplicity, the target range is provided below rather than target per model area (see Figure 2).
- The FK OFW target is defined as the average concentration in 1985 of the bayside and oceanside waters.
- The FKNMS WQPP targets are from the *2009 Annual Report of the Water Quality Monitoring Project for the Water Quality Protection Program of the Florida Keys National Marine Sanctuary* (FIU, 2010). Micromole units were converted to µg/l. DIN is dissolved inorganic nitrogen.

Sub-area within the South-Central Keys	FKRAD TN Target Range (µg/l)	FK OFW TN Target (µg/l)	FKNMS WQPP DIN Target (µg/l)	FKRAD TP Target Range (µg/l)	FK OFW TP Target (µg/l)	FKNMS WQPP TP Target (µg/l)
Model Areas	135-221			7-12		
Bayside		370			14	
Oceanside		288			15	
Near Shore and Coastal Waters			≤ 10			≤ 7.7

Table 2c. Comparison of water quality targets in the Central Keys Area

Notes:

- The FKRAD target for the Halo Zone is defined as "an insignificant increase above natural background (an increase of < 10 µg/l TN and < 2 µg/l TP)" by model area. Since each geographic location has several model areas, for simplicity, the target range is provided below rather than target per model area (see Figure 2).
- The FK OFW target is defined as the average concentration in 1985 of the bayside and oceanside waters.
- The FKNMS WQPP targets are from the *2009 Annual Report of the Water Quality Monitoring Project for the Water Quality Protection Program of the Florida Keys National Marine Sanctuary* (FIU, 2010). Micromole units were converted to µg/l. DIN is dissolved inorganic nitrogen.

Sub-area within the Central Keys	FKRAD TN Target Range (µg/l)	FK OFW TN Target (µg/l)	FKNMS WQPP DIN Target (µg/l)	FKRAD TP Target Range (µg/l)	FK OFW TP Target (µg/l)	FKNMS WQPP TP Target (µg/l)
Model Areas	125-399			7-13		
Bayside		370			14	
Oceanside		288			15	
Near Shore and Coastal Waters			≤ 10			≤ 7.7

Table 2d. Comparison of water quality targets in the Northern Keys Area

Notes:

- The FKRAD target for the Halo Zone is defined as "an insignificant increase above natural background (an increase of < 10 µg/l TN and < 2 µg/l TP)" by model area. Since each geographic location has several model areas, for simplicity, the target range is provided below rather than target per model area (see Figure 2).
- The FK OFW target is defined as the average concentration in 1985 of the bayside and oceanside waters.
- The FKNMS WQPP targets are from the *2009 Annual Report of the Water Quality Monitoring Project for the Water Quality Protection Program of the Florida Keys National Marine Sanctuary* (FIU, 2010). Micromole units were converted to µg/l. DIN is dissolved inorganic nitrogen.

Sub-area within the Northern Keys	FKRAD TN Target Range (µg/l)	FK OFW TN Target (µg/l)	FKNMS WQPP DIN Target (µg/l)	FKRAD TP Target Range (µg/l)	FK OFW TP Target (µg/l)	FKNMS WQPP TP Target (µg/l)
Model Areas	123-764			8-11		
Bayside		370			14	
Oceanside		288			15	
Near Shore and Coastal Waters			≤ 10			≤ 7.7

3.2 Restoration of the Designated Uses of the Impaired Waters

Nutrient Impairments

The nutrient concentrations of the Halo Zone WBIDs and near shore waters are influenced by far field anthropogenic and natural nutrient loading, outside of the influence of the Florida Keys stakeholders. The FKRAD participants have and will continue to significantly reduce the additive anthropogenic nutrients due to wastewater and stormwater loads.

While the influences of the islands of the Florida Keys will be minimized by these activities, continuing work on the Everglades, Peace River, Caloosahatchee River, Mississippi River, and

other outside controlling factors is needed to return the water quality in the Florida Keys to historic conditions.

DO Impairments

DEP has not been able to identify a causative pollutant for the DO impairment in one of the WBIDs with internal residential canals because there are insufficient nutrient data available to determine a causative pollutant. However, DEP acknowledges that the following items should be addressed in the canals to achieve Class III marine surface water DO standards: poor circulation, weed wrack, organic sediments, and water depth issues. The management actions and restoration activities described in **Section 4** and **Appendix A**, particularly the specific canal restoration projects, are anticipated to improve water quality conditions in the canals; therefore, DEP is placing the DO impairments in assessment category 4e (ongoing restoration activities) and postponing TMDL development.

3.3 Schedule to Meet Targets and Restoration Goals

The original FKRAD established a goal of achieving water quality targets by 2020 with the completion of all committed wastewater and stormwater management activities by 2015. A catalyst for the original FKRAD was the legislative mandate for conversion of onsite sewage treatment and disposal systems (OSTDS) to central sewer systems by December 31, 2015. The conversion timeline has since been legislatively extended to 2020 for those OSTDS installed after July 1, 2010. According to the Florida Department of Health (FDOH) – Monroe County, as of July 2016, there were 19,000 developed properties connected to central sewer. This represents an 80 % connection rate based on a 2002 estimate of 24,200 developed properties with OSTDS. DEP indicates that as of September 2016, 70 of 249 permitted wastewater facilities have not connected to centralized advanced wastewater treatment (AWT) facilities.

Since completion of the original FKRAD in 2008 and the 2011 update, Monroe County has undertaken a comprehensive evaluation of the more than 500 residential canals in the Florida Keys since the canals discharge directly to near shore OFWs. Most canals were designed as long, multi-segmented, dead-end canal networks which maximize waterfront property but result in little or no tidal flushing. Without adequate tidal flushing, the canals accumulate oxygen consuming sediments, nutrients, and organic matter.

The resulting 2013 Monroe County CMMP provides an updated water quality assessment of all residential canals within the Florida Keys. Of the more than 500 canals, 171 canals received the ranking of "Good", 180 canals received the ranking of "Fair", and 131 canals received the ranking of "Poor." A timeline is not provided in the CMMP for completion of all canal restoration projects; however, **Appendix A** reflects the completed, underway, and planned canal restoration projects known at the time of this update.

The state of Florida has established a no discharge zone for sewage from marine vessels in Monroe County. The City of Key West provides sanitary pump-out service at Garrison Bight

Marina and Key West Bight Marina, and utilizes a boat to provide sanitary pump-out service to all vessels in the mooring field. Additionally, during 2008 to 2015, the city completed construction and installation of 49 gravity injection wells with baffle boxes and nine pollution control baffle boxes, exceeding the target of two stormwater disposal wells with baffle boxes per year.

Section 4: Proposed Management Actions

4.1 Responsible Participating Entities

The FKRAD is implemented by local governments, state agencies, and federal partners. Entities responsible for the completion of management activities are the following:

- City of Key Colony Beach.
- City of Key West.
- City of Layton.
- City of Marathon.
- DEP Florida Park Service.
- FDOT.
- KLWTD.
- Monroe County.
- U.S. Navy.
- Village of Islamorada.

4.2 Existing Management Activities

Management activities are classified into three different categories: wastewater management, stormwater management, and regulatory programs. The activities are summarized below in **Table 3**.

Table 3. Existing management activities

Wastewater Management Practices	Stormwater Management Practices	Regulatory Actions
• Eliminate cesspits. • Centralize wastewater services. • Upgrade privately-owned wastewater systems. • Install Class V deep injection wells for disposal of wastewater effluent (replace existing ocean outfall). • Marine pump-out service for moored boats to reduce illicit discharges.	• Retrofit existing drainage systems with stormwater treatment prior to outfall to Halo Zone waters. • Retrofit existing drainage systems with stormwater treatment and stormwater treatment wells (no direct outfall to Halo Zone). • Incorporate treatment components in new transportation projects.	• Designation as an ACSC. • Implement local land development regulations. • Implement Section 403.086(10), F.S., sewage disposal facilities; advanced and secondary waste treatment in the Florida Keys.

Additionally, Monroe County has conducted a pilot program in collaboration with DEP, FKNMS, neighboring local governments, and other programs to improve water quality in the canals at a cost of \$7 million. Possible options for treatment include vacuum dredging to remove organics; air curtains to reduce seaweed loading; injection well systems to facilitate flushing; improved culvert connections; and backfilling.

4.3 Completed and Proposed Management Activities and Projects

See **Appendix A** for activities and projects completed, underway, or planned by the responsible stakeholders since the 2011 update. At the time of the 2011 update, 58 projects (primarily septic to sewer conversions and some stormwater management projects) had been completed by stakeholders. Based on the 2017 update project information in **Appendix A**, 42 additional projects have been completed, along with 7 underway projects, and 4 planned projects, for a total of 53 projects.

4.4 Estimated Pollutant Load Reduction from the Implementation of Actions

Quantification of the actual water quality benefits achieved in the receiving waters directly attributable to the reduction of the wastewater and anthropogenic stormwater nutrient loads, expressed in terms of water column and groundwater concentrations of nutrients, is technically difficult due to flushing characteristics of the surficial aquifers and the canal systems and the dynamic circulation patterns in the near shore waters. However, the anticipated reductions below in **Table 4** were published in the 2011 update. Where possible, stakeholders identified TN and TP reductions associated with their projects completed, planned, or underway since 2011 totaling 139,516 lb-yr of TN and 41,731 lb-yr TP, as detailed in **Appendix A**.

Table 4. Anticipated load reductions associated with management activities

Location	Nutrient	Anthropogenic Load (lb-yr)	Loading (lb-yr) After Management Action (by 2020)	% Loading Reduction
Northern Keys	TN	360,488	129,414	64%
	TP	90,178	23,427	74%
Central Keys	TN	164,705	64,797	61%
	TP	40,527	11,918	70%
South Central Keys	TN	200,668	14,835	93%
	TP	46,628	4,945	89%
Southern Keys	TN	239,863	40,943	83%
	TP	69,035	7,717	89%

4.5 Future Growth and New Sources

The potential for growth of anthropogenic sources is generally believed to be limited due to the regulations of multiple federal, state, regional, and local programs and plans, combined with the lack of raw land and the overall cost of living in the Florida Keys.

New pollutant sources can be expected from the limited growth. Programs and management practices that are in place are expected to limit nutrient discharges to the Halo Zone waters from any new pollutant sources from the limited available growth.

4.6 Implementation Schedule

Stakeholders intend to meet the restoration goal of 2020. There are several projects underway that are scheduled to be completed in 2018/2019 and more canal restoration projects that are planned or under consideration.

4.7 Funding

Stakeholder projects have been funded to date through a variety of sources including the following:

- Bonds for Everglades restoration.
- Legislative appropriations.
- DEP State Revolving Loan Fund.
- South Florida Water Management District stormwater grants and cost-share programs.
- Local sales tax.
- U.S. Army Corps of Engineers.
- Federal Highway Administration.
- The Resources and Ecosystems Sustainability, Tourist Opportunities, and Revived Economies of the Gulf Coast States Act (RESTORE Act).

More than \$13 million was appropriated in the 2017/2018 fiscal year General Appropriations Act (state budget) for Florida Keys ACSC and City of Key West ACSC projects.

In 2016, the Florida Legislature amended Section 215.619, F.S. (bonds for Everglades restoration), to specify that the Florida Keys ACSC and the City of Key West ACSC may seek bonds for projects that protect, restore, or enhance near shore water quality and fisheries, such as stormwater or canal restoration projects, projects to protect water resources available to the Florida Keys, including wastewater management projects.

Also in 2016, the Florida Legislature added a provision to Section 259.105, F.S. (Florida Forever Act) that states for the 2016/2017 fiscal year, the sum of \$5 million in non-recurring funds from the General Revenue Fund is appropriated to DEP to be distributed in accordance with the existing interlocal agreements for the purposes of constructing sewage collection, treatment and

disposal systems; implementing stormwater collection and treatment systems; canal restoration and muck remediation projects; and projects that protect and enhance water supply in the Florida Keys and City of Key West ACSCs. Further, beginning in the 2017/2018 fiscal year and continuing through the 2026/2027 fiscal year, at least \$5 million shall be spent on land acquisition within the Florida Keys ACSC.

4.8 Enforcement Programs and Local Ordinances for Non-Voluntary Strategies

Enforcement of existing regulations and ordinances by state, regional, and local agencies will achieve the implementation of the wastewater and stormwater management actions.

4.9 Commitment to Plan Implementation

Successful implementation requires commitment and follow-up. The responsible stakeholders have expressed their intention to carry out the plan, monitor its effects, and continue to coordinate within and across jurisdictions to achieve nutrient reduction goals. As the water quality targets must be achieved by 2020, stakeholders must pursue management actions and funding to reduce nutrients in the Florida Keys.

Section 5: Procedures for Monitoring and Reporting Results

5.1 Water Quality Monitoring Parameters, Frequency, and Network

Currently, the primary water quality monitoring network in the Florida Keys is the FKNMS Ambient Water Quality Network that is operated by the Florida International University Southeastern Environmental Research Center. This network contains approximately 30 sites, with only a few sites within the Halo Zone. The water quality status from this network is updated annually and reported to the WQPP.

As part of this update, DEP is providing funding assistance for an enhanced monitoring network in the Halo Zone, with Monroe County and, potentially, other local entities providing matching funds. Monroe County agreed to be the lead entity responsible for the DEP grant and for reporting. The monitoring consists of collecting samples at multiple stations in the 23 WBIDs, with 4 samples collected at each station in a calendar year. This effort should total about 250 samples over the calendar year; the grant agreement is valid for 2 years. **Table 5** identifies the recommended number of stations per WBID to meet the needs for FKRAD evaluation and to measure the benefits of some of the canal restoration projects. **Table 6** provides the water quality parameters to be collected, including nitrate (NO_x) and total Kjeldahl nitrogen (TKN). Additionally, the FKRAD monitoring stations must account for the FKRAD modeling QUADs (**Figure 2**) for nutrient assessment.

Table 5. List of WBIDs and the number of recommended stations for FKRAD compliance monitoring

WBID	Waterbody Name	Location	Number of Stations
6006A	South Key Largo	Northern Keys	6
6006B	Middle Key Largo	Northern Keys	4
6006C	Upper Key Largo	Northern Keys	2
6009	Plantation Keys	Northern Keys	4
6017	Upper Matecumbe Key	Northern Keys	4
6019	Lower Matecumbe Key	Northern Keys	4
6010	Long Key	Central Keys	2
6011A	Vaca Key	Central Keys	4
6011B	Key Colony	Central Keys	4
6011C	Grassy Key	Central Keys	2
6012E	Big Torch Key	Central Keys	1
6016	Duck Key	Central Keys	2
6012A	Big Pine Key	South Central Keys	2
6012C	No Name Key	South Central Keys	1
6012D	Long Beach	South Central Keys	1
6013A	Saddlebunch Keys	South Central Keys	4
6013B	Sugarloaf	South Central Keys	1
6013C	Cudjoe Key	South Central Keys	4
6013D	Little Knockemdown Key	South Central Keys	1
6014C	U.S. Naval Air Station Key West	South Central Keys	2

WBID	Waterbody Name	Location	Number of Stations
6018	Bahia Honda State Park	South Central Keys	2
6014A	Key West	Southern Keys	4
6014B	Stock Island	Southern Keys	2

Table 6. Water quality parameters for FKRAD monitoring

Parameter	Sample Type	Description	Lab Method
NO_x	Water Grab	Nitrite+Nitrate in aqueous matrices as mg-N/L	EPA 353.2 Rev. 2.0
TP	Water Grab	TP in aqueous matrices as mg-P/L	EPA 365.1 Rev. 2.0
TKN	Water Grab	TKN in aqueous matrices	EPA 351.2 Rev. 2.0
Chlorophyll <i>a</i>	Water Grab	Phytoplankton chlorophyll <i>a</i> (corrected for phaeophytin) by spectrophotometry	SM 10200 H (mod.)
DO	Field Measurement	DO concentration in water measured by field meter	Discrete Measurement
Percent DO Saturation	Field Measurement	Percent DO saturation in water measured by field meter	Discrete Measurement
pH	Field Measurement	pH level in water measured by field meter	Discrete Measurement
Specific Conductance	Field Measurement	Specific conductance of water measured by field meter	Discrete Measurement
Water Temperature	Field Measurement	Water temperature measured by field meter	Discrete Measurement

All water quality data will be uploaded quarterly into the Florida Watershed Information Network (WIN) Database. A quarterly progress report will be submitted to DEP that includes the following information:

- A tabulation of the water quality samples collected at each station during the quarter, including sampling dates and times for each site.
- Identify any field quality assurance problems encountered during the quarter.
- Identify any corrective actions necessary as a result of problems encountered during the quarter.
- Copies of all field data sheets/forms and notes for samples and measurements collected during the quarter.
- Status information on uploading lab and field data to WIN.

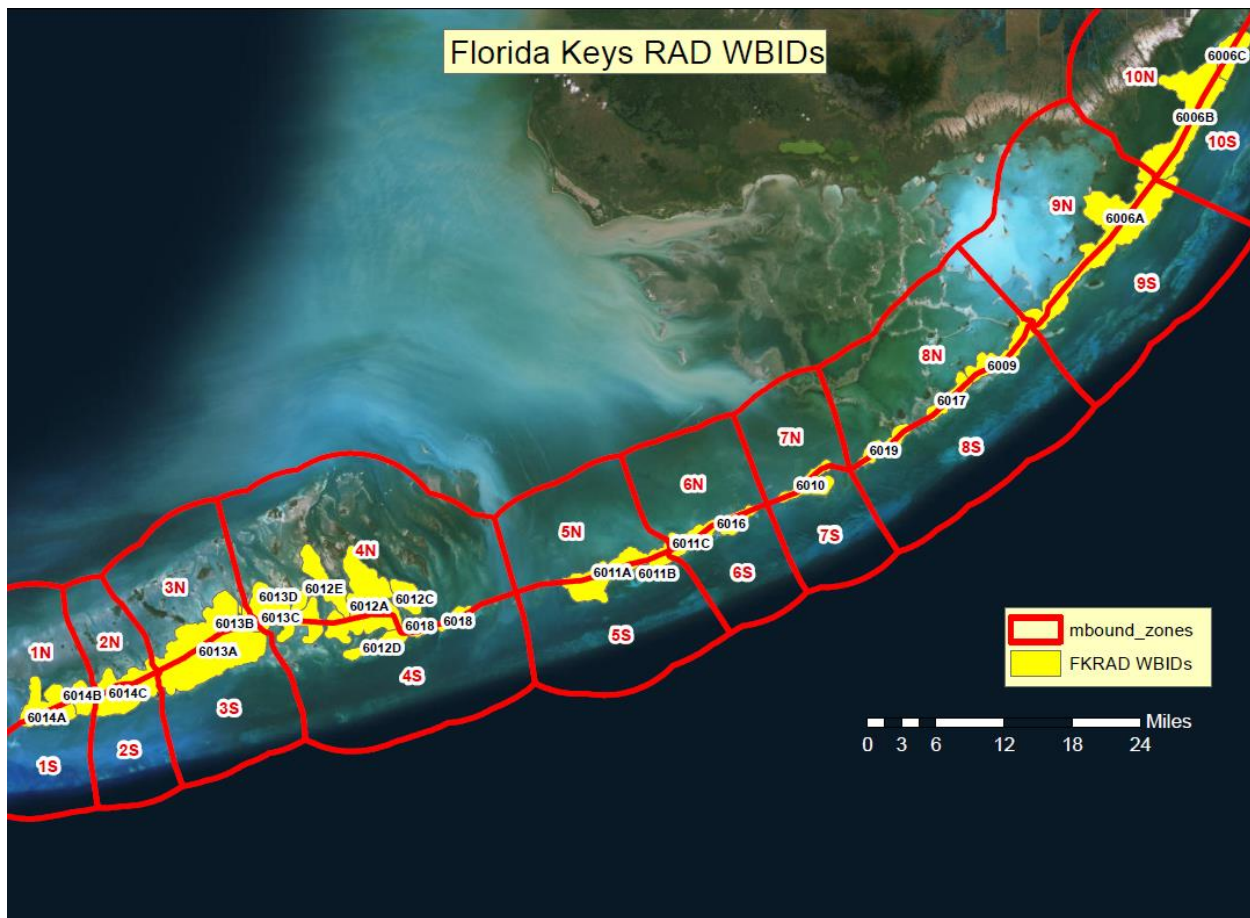


Figure 2. WBIDs and QUAD modeled boundaries

5.2 Data Management and Assessment

As of June 30, 2017, water quality data in Florida is entered by the entity collecting the data into WIN, which replaced the Florida Storage and Retrieval System (STORET). DEP pulls water quality data directly from WIN for impaired waters evaluations and TMDL development. Data providers are required to upload their data regularly, so the information can be used as part of the water quality assessment process and for annual reporting. Data providers should upload their data to WIN, upon completion of the appropriate quality assurance/quality control (QA/QC) checks. All data collected in the last quarter of the calendar year should be uploaded no later than April 1st of the following year.

The water quality data will be compared to the FKRAD water quality targets identified in **Tables 2a to 2d** to evaluate achievement of the targets.

5.3 QA/QC

Stakeholders participating in the monitoring plan must collect water quality data in a manner consistent with Chapter 62-160, F.A.C., and the DEP standard operating procedures (SOPs) for

QA/QC required therein. The most current version of these procedures is available on the DEP website. For FKRAD-related data analyses, entities should use National Environmental Laboratory Accreditation Conference (NELAC) National Environmental Laboratory Accreditation Program (NELAP)–certified laboratories or other labs that have been audited by DEP and determined to meet the certification and other requirements outlined in the SOPs.

5.4 Methods for Evaluating Progress Towards Goals

Monitoring for success will include identification of physical connections to central wastewater systems; number of eliminated OSTDSs; total nutrients in wastewater effluent discharged to deep well; number of stormwater systems installed; and decrease in near shore nutrient concentrations in comparison to water quality targets and OFW background concentrations.

Section 6: Proposed Corrective Actions

6.1 Corrective Actions for Non-Improvement of Impairment

Water quality in the near shore waters is affected by far field sources that are a combination of naturally occurring nutrient loads and anthropogenic sources located outside of the Florida Keys, which are outside the control of the responsible stakeholders. However, management actions are identified in **Table 3** for the stakeholders to implement and for which regulatory agencies have enforcement action should implementation fail to remedy the nutrient impairments. For example, FDOH can conduct enforcement actions against owners of non-complying OSTDS; DEP can conduct enforcement actions against public and privately-owned wastewater treatment facilities (WWTFs) that do not produce an effluent and/or dispose of its effluent in a manner compliant with state requirements.

6.2 Corrective Actions for Management Actions Not Completed on Schedule

The stakeholders will a report to DEP the progress on the management actions and projects, the overall success of the plan, and the need for corrective actions, if any, including schedule modifications.

6.3 DEP Notification Process for Corrective Action Implementation

If a corrective action is deemed overly significant, such as the introduction of a new management action to address the failure of an existing management action, DEP will be notified formally through written correspondence of this significant change to the plan's implementation by the responsible stakeholder.

Appendices

Appendix A: Responsible Stakeholder Projects

Table A-1. Responsible stakeholder projects completed since 2011, underway, or planned

Lead Entity	Project Number	Project Name	Project Description	Project Type	Status	Actual or Anticipated Operational Date	Acres Treated	TN Reduction (lb/yr)	TP Reduction (lb/yr)	Cost Estimate	WBID	Location
City of Key West	KW-06	Collection of Sanitary Waste	Marine vessel pump-out program: 10,231 pump outs of moored vessels, totaling 204,790 gallons. One pump out boat serves the mooring field and off-shored anchored vessels. Sanitary pump out station installation completed at Garrison Bight City Marina on Wahoo and Kingfish Piers. KW Bight sanitary pump outs available at each slip at no charge.	Sewage Collection	Underway	2011	1,200	2011-2016 171 lbs removed Average TN Reduction 28 lbs/yr	2011-2016 31 lbs removed Average TP Reduction 5 lbs/yr	\$88,000	6014A-N	Southern Keys
City of Key West	KW-07	17 th St. LAP & Elizabeth St. Olivia St. & E. Front St Flood Mitigation	Construction of seven baffle boxes and seven stormwater disposal wells.	Baffle Boxes and Stormwater Disposal Wells	Completed	2015	59	484	75	\$3,504,395	6014A-N	Southern Keys
City of Key West	KW-08	20 th St. LAP Project	Construction of one baffle box and one stormwater disposal well.	Baffle Boxes and Stormwater Disposal Wells	Completed	2011	14	90	14	\$440,726	6014A-S	Southern Keys
City of Marathon	M-02	Service Area 1	Installation of central wastewater collection system serving Service Area 1 and provision of AWT treatment with disposal in a shallow effluent disposal well serving 312 EDUs.	Wastewater Service Area Expansion	Completed	2012	Not provided	1672	760	Not provided	6011A	Central Keys
City of Marathon	M-07	Service Area 3	Installation of central wastewater collection system serving Service Area 3 and provision of AWT treatment with disposal in a shallow effluent disposal well serving 1,565 EDUs.	Wastewater Service Area Expansion	Completed	2011	Not provided	15,885	3,814	Not provided	6011A	Central Keys

Lead Entity	Project Number	Project Name	Project Description	Project Type	Status	Actual or Anticipated Operational Date	Acres Treated	TN Reduction (lb/yr)	TP Reduction (lb/yr)	Cost Estimate	WBID	Location
City of Marathon	M-11	Service Area 7	Installation of centralized cluster wastewater collection system serving Service Area 7 and provision of secondary treatment with disposal in a shallow effluent disposal wells serving 360 EDUs.	Wastewater Service Area Expansion	Completed	2011	Not provided	1,888	944	Not provided	6011A	Central Keys
City of Marathon	M-12	Service Area 7	Installation of centralized cluster wastewater collection system serving Service Area 7 and provision of secondary treatment with disposal in a shallow effluent disposal wells serving 1,237 EDUs.	Wastewater Service Area Expansion	Completed	2012	Not provided	6,710	3,240	Not provided	6011C	Central Keys
City of Marathon	M-15	Stormwater Treatment Systems	Installation of stormwater interception and treatment system serving approximately 1,135 acres in conjunction with the central wastewater collection system serving Service Area 5.	Stormwater System Upgrade	Completed	2011	1,135	441	67	Not provided	6011A	Central Keys
FDOT District VI	FDOT-07	SR 5/Overseas Highway	Resurfacing from mile marker (MM) 103.2 Hialeah Lane to MM 106.6 Reef Drive.	Drainage Improvement	Completed	2012	Not provided	Not provided	Not provided	Not provided	All	All
FDOT District VI	FDOT-10	SR 5/Overseas Highway	Resurfacing from 2,000 feet south of MM 100 to 2,580 feet south of MM 97.	Drainage Improvement	Completed	2012	Not provided	Not provided	Not provided	Not provided	All	All
FDOT District VI	FDOT-11	SR 5/Overseas Highway	Resurfacing from MM 49.1/north of 37th St. to MM 53.1/Bridge over Vaca Cut.	Drainage Improvement	Completed	2012	Not provided	Not provided	Not provided	Not provided	All	All
FDOT District VI	FDOT-15	Monroe Countywide Drainage Pushbutton Projects	Drainage projects.	Drainage Improvement	Completed	2011-2016	Not provided	Not provided	Not provided	Not provided	All	All
FDOT District VI	FDOT-16	SR 5/Overseas Highway	MM 59 to Grassy Key drainage improvements.	Drainage Improvement	Completed	2012	Not provided	Not provided	Not provided	Not provided	All	All

Lead Entity	Project Number	Project Name	Project Description	Project Type	Status	Actual or Anticipated Operational Date	Acres Treated	TN Reduction (lb/yr)	TP Reduction (lb/yr)	Cost Estimate	WBID	Location
FDOT District VI	FDOT-17	SR 5/Overseas Highway	From Caribbean Drive/MM 24.5 to West Shore Drive/MM 25 drainage improvements.	Drainage Improvement	Completed	2014	Not provided	Not provided	Not provided	Not provided	All	All
Florida Keys Aqueduct Authority (FKAA)	FKAA-01	Key Haven Wastewater Treatment Plant (WWTP)	Due to excessive infiltration and inflow, decommissioning of small package plant with flow redirected to the Big Coppitt regional WWTP on east Rockland Key.	Wastewater Treatment Facility Upgrade	Underway	2018	Not provided	Not provided	Not provided	Not provided	Not provided	Southern Keys
Florida State Parks System	FSPS-01	Dagny Johnson Key Largo Hammock Botanical State Park	Convert assistant manager residence and 7 ranger residences to central wastewater system provided by KLWTD.	Wastewater Treatment Facility Upgrade	Completed	2015	Not provided	Not provided	Not provided	\$21,879	6006B	Northern Keys
Florida State Parks System	FSPS-06	Lignumvitae Key State Park	Septic conversion at land-based shop building to Islamorada wastewater facility.	Wastewater Service Area Expansion	Planned	TBD	TBD	TBD	TBD	TBD	Not provided	Northern Keys
Florida State Parks System	FSPS-07	Lignumvitae Key State Park	Septic conversion at land-based residence to Islamorada wastewater facility.	Wastewater Service Area Expansion	Completed	2016	Not provided	Not provided	Not provided	\$119,767	Not provided	Northern Keys
Florida State Parks System	FSPS-08	Windley Key Fossil Reef State Park	Septic conversion at visitor center to Islamorada wastewater facility.	Wastewater Treatment Facility Upgrade	Completed	2016	Not provided	Not provided	Not provided	\$117,420	Not provided	Northern Keys
Florida State Parks System	FSPS-10	Long Key State Park	Construction of new shop building that will have wastewater flows handled by the City of Layton.	Wastewater Service Area Expansion	Planned	TBD	TBD	TBD	TBD	TBD	6010	Central Keys
Florida State Parks System	FSPS-12	Curry Hammock State Park	Wastewater collection/transmission system designed in which flows will transmit to the City of Marathon WWTP for the ranger station, 2 residences, shop building, picnic area, and bathhouse.	Wastewater Service Area Expansion	Completed	2014	Not provided	Not provided	Not provided	\$227,941	6011A	Central Keys

Lead Entity	Project Number	Project Name	Project Description	Project Type	Status	Actual or Anticipated Operational Date	Acres Treated	TN Reduction (lb/yr)	TP Reduction (lb/yr)	Cost Estimate	WBID	Location
Florida State Parks System	FSPS-18	Fort Zachary Taylor State Park	Septic systems decommissioned and effluent from concession and beach bathroom, 2 residences, fort bathroom, shop, and volunteer village transmitted to City of Key West WWTP.	Wastewater Service Area Expansion	Completed	2011	Not provided	Not provided	Not provided	See FSPS-19	6014A	Southern Keys
Florida State Parks System	FSPS-19	Fort Zachary Taylor State Park	Construction of new entrance station that is connected to central sewer.	Wastewater Service Area Expansion	Completed	2017	Not provided	Not provided	Not provided	\$2,292,151	6014A	Southern Keys
Key Largo Wastewater Treatment District	KLWTD-08	Basin G central wastewater collection system	Construction of the Basin G central wastewater collection system serving 1,625 EDUs with subsequent connection to the 2.3 mgd AWT treatment facility with finished effluent disposal in a deep Class V well.	Wastewater Service Area Expansion	Completed	2011	Not provided	15,494	4,603	See KLWTD-01	6006A	Northern Keys
Key Largo Wastewater Treatment District	KLWTD-09	Basin H central wastewater collection system	Construction of the Basin H central wastewater collection system serving 737 EDUs with subsequent connection to the 2.3 mgd AWT treatment facility with finished effluent disposal in a deep Class V well.	Wastewater Service Area Expansion	Completed	2011	Not provided	5,791	1,554	See KLWTD-01	6006A	Northern Keys
Key Largo Wastewater Treatment District	KLWTD-13	Basin I central wastewater collection system	Construction of the Basin I central wastewater collection system serving 1,910 EDUs with subsequent connection to the 2.3 mgd AWT treatment facility with finished effluent disposal in a deep Class V well.	Wastewater Service Area Expansion	Completed	2011	Not provided	13,931	4,031	Not provided	6006A	Northern Keys
Key Largo Wastewater Treatment District	KLWTD-14	Basin J central wastewater collection system	Construction of the Basin J central wastewater collection system serving 893 EDUs with subsequent connection to the 2.3 mgd AWT treatment facility with finished effluent disposal in a deep Class V well.	Wastewater Service Area Expansion	Completed	2011	Not provided	6,836	2,041	Not provided	6006A	Northern Keys
Key West Resort Utilities Corporation	KWRU-01	Stock Island WWTP	Expansion of 0.499 mgd AWT plant using shallow disposal wells to approx. 0.850 mgd.	Wastewater Treatment Facility Upgrade	Completed	2015	Not provided	Not provided	Not provided	Not provided	Not provided	Southern Keys

Lead Entity	Project Number	Project Name	Project Description	Project Type	Status	Actual or Anticipated Operational Date	Acres Treated	TN Reduction (lb/yr)	TP Reduction (lb/yr)	Cost Estimate	WBID	Location
Monroe County	MC-01	Duck Key/Hawks Cay WWTP Upgrade	Conversion to AWT and construction of collection system (1,500 EDUs).	Wastewater Treatment Facility Upgrade	Completed	2011	Not provided	2,226	1113	Not provided	6016	Central Keys
Monroe County	MC-02	Cudjoe Regional Wastewater System (CRWS) - Advanced Wastewater Reclamation Facility (AWRF)	Went into service in October 2015 using a deep injection disposal well. Designed for an average annual daily flow of just under 1.0 mgd; as of July 2017, processes 0.3 mgd.	Wastewater Treatment Facility Upgrade	Completed	2015	Not provided	Not provided	Not provided	Not provided	Not provided	South Central Keys
Monroe County	MC-14	Veteran's Park	Upgrade onsite wastewater system to best available technology (BAT) standards.	Wastewater Treatment Facility Upgrade	Planned	2017	Not provided	Not provided	Not provided	Not provided	Not provided	Not provided
Monroe County	MC-15	Pigeon Keu	Upgrade onsite wastewater system to BAT standards.	Wastewater Treatment Facility Upgrade	Planned	2017	Not provided	Not provided	Not provided	Not provided	Not provided	Not provided
Monroe County	MC-16	Canal Restoration #266 Organic Removal and Air Curtain	Removal of approximately 8,300 cubic yards of organic muck and 160 cubic yards of trash from the canal bottom and the installation of an air curtain to prevent seaweed from entering the canal.	Canal Restoration	Completed	2016	1.1	TBD	TBD	\$1,303,355	6012A	Southern Keys
Monroe County	MC-17	Canal Restoration #290 Organic Removal and Air Curtain	Removal of approximately 4,700 cubic yards of organic muck and 130 cubic yards of trash from the canal bottom and the installation of an air curtain to prevent seaweed from entering the canal.	Canal Restoration	Completed	2017	0.59	0	0	\$788,421	6012A	Southern Keys
Monroe County	MC-18	Canal Restoration #287 Air Curtain	The installation of an air curtain to prevent seaweed from entering the canal.	Canal Restoration	Completed	2016	0.5	TBD	TBD	\$101,192	6012A	Southern Keys
Monroe County	MC-19	Canal Restoration #29 Backfilling	The placement of approximately 27,000 cubic yards of fill material in the canal.	Canal Restoration	Completed	2015	0.82	0	0	\$1,360,000	6006A	Northern Keys

Lead Entity	Project Number	Project Name	Project Description	Project Type	Status	Actual or Anticipated Operational Date	Acres Treated	TN Reduction (lb/yr)	TP Reduction (lb/yr)	Cost Estimate	WBID	Location
Monroe County	MC-20	Canal Restoration #277 Culvert	The installation of an approximately 200 linear feet of 60-inch diameter reinforced concrete pipe with a manatee grate.	Canal Restoration	Completed	2016	0.32	0	0	\$423,957	6012A	Southern Keys
Monroe County	MC-21	Canal Restoration #472 Culvert	The installation of an approximately 120 linear feet of a 38-inch x 24-inch diameter reinforced concrete elliptical pipe with a manatee grate.	Canal Restoration	Completed	2015	0.14	0	0	\$199,291	6014	Southern Keys
Monroe County	MC-22	Canal Restoration #83 Organic Removal, Backfilling, and Air Curtain	Removal of approximately 3,500 cubic yards of organic muck, the placement of approximately 5,570 cubic yards of fill material, and the installation of an air curtain to prevent seaweed from entering the canal.	Canal Restoration	Underway	2017	1.27	TBD	TBD	\$1,524,040	6006A	Northern Keys
Monroe County	MC-23	Canal Restoration #75 Backfilling	The placement of approximately 27,000 cubic yards of fill material in the canal.	Canal Restoration	Underway	2018	1.6	0	0	\$1,300,000	6006A	Northern Keys
Monroe County	MC-24	Canal Restoration #48, #59, #79, and #80 Augmented Aeration	The installation of an augmented aeration system at each canal system.	Canal Restoration	Underway	2018	3.5	TBD	TBD	\$200,000	6006A	Northern Keys
Monroe County	MC-25	Long Key East and West	Construction of an extension of the collection system to include most properties on the east and west ends of Long Key (excluding Outdoor Resorts and Fiesta Key) (100 equivalent dwelling units [EDUs])	Wastewater Service Area Expansion	Completed	2017	Not provided	Not provided	Not provided	Not provided	6010	Central Keys

Lead Entity	Project Number	Project Name	Project Description	Project Type	Status	Actual or Anticipated Operational Date	Acres Treated	TN Reduction (lb/yr)	TP Reduction (lb/yr)	Cost Estimate	WBID	Location
U.S. Navy	USN-1	Wastewater Utility Service by FKAA (see FKAA-02)	In October 2015, the U.S. Navy entered into a contract with FKAA to own and be responsible for five wastewater systems located at Boca Chica Field, Naval Branch Health Clinic, Sigsbee Park, Truman Annex, and Trumbo Point including Fleming Key. FKAA will transfer wastewater from these systems to its Big Coppitt plant for treatment (1,730 EDUs).	Wastewater Service Area Expansion	Completed	2011	Not provided	Not provided	Not provided	Not provided	6014C	South Central Keys
Village of Islamorada	VI-2	Middle Plantation Key Central Wastewater Collection System	Construction to connect to the existing BAT Central WWTF located at the KLWTD Plant, MM1 00 (1,600 EDUs).	Wastewater Service Area Expansion	Completed	2015	Not provided	13,274	3,553	Not provided	6009	Northern Keys
Village of Islamorada	VI-3	South Plantation Key Central Wastewater Collection System	Construction to connect to the existing BAT Central WWTF located at the KLWTD Plant, MM 100 (approximately 1,900 EDUs).	Wastewater Service Area Expansion	Completed	2015	Not provided	11,129	3,188	Not provided	6009	Northern Keys
Village of Islamorada	VI-4	Windley Key Central Wastewater Collection System	Construction to connect to the existing BAT Central WWTF located at the KLWTD Plant, MM 100 (900 EDUs).	Wastewater Service Area Expansion	Completed	2015	Not provided	8,451	2,486	Not provided	6009	Northern Keys
Village of Islamorada	VI-5	Upper Matecumbe Key Central Wastewater Collection System	Construction to connect to the existing BAT Central WWTF located at the KLWTF Plant, MM 100 (approximately 2,600 EDUs).	Wastewater Service Area Expansion	Completed	2015	Not provided	11,214	3,279	Not provided	6017	Northern Keys
Village of Islamorada	VI-6	North Upper Matecumbe Key Central Wastewater Collection System	Combined with above.	Wastewater Service Area Expansion	Completed	2015	Not provided	13,311	3,831	Not provided	6017	Northern Keys

Lead Entity	Project Number	Project Name	Project Description	Project Type	Status	Actual or Anticipated Operational Date	Acres Treated	TN Reduction (lb/yr)	TP Reduction (lb/yr)	Cost Estimate	WBID	Location
Village of Islamorada	VI-7	Lower Matecumbe Key Central Wastewater Collection System	Construction to connect to the existing BAT Central WWTF located at the KLWTD Plant, MM 100 (approximately 1,600 EDUs).	Wastewater Service Area Expansion	Completed	2015	Not provided	10,518	3,107	Not provided	6019	Northern Keys
Village of Islamorada	VI-8	Canal Restoration #132 Air Curtain	The installation of an air curtain to prevent seaweed from entering the canal.	Canal Restoration	Underway	2019	0.2	TBD	TBD	\$50,000	6009	Upper Keys
Village of Islamorada	VI-9	Canal Restoration #137 Air Curtain	The installation of aerators within boat basin and an air curtain to prevent seaweed from entering the canal.	Canal Restoration	Completed	2014	2.7	TBD	TBD	\$28,597	6009	Upper Keys
Village of Islamorada	VI-10	Canal Restoration #145 Air Curtain	The installation of an air curtain to prevent seaweed from entering the canal.	Canal Restoration	Underway	2017	0.2	TBD	TBD	\$66,698	6019	Upper Keys
Village of Islamorada	VI-11	Canal Restoration #148 Air Curtain	The installation of an air curtain to prevent seaweed from entering the canal.	Canal Restoration	Completed	2017	0.1	TBD	TBD	\$32,334	6019	Upper Keys