

Fish & Macroinvertebrates

Summary Findings

In 2008, four of six monitoring sites in central Shark River Slough did not meet restoration targets (red) because of drier conditions than expected based on rainfall¹. The net effect was one of concern (yellow) for the region. These conditions resulted from fewer fish that prefer wetter conditions than expected, but levels of drought-tolerant species were consistent with expectations. Water management is causing drier conditions than would be expected based on the amount of rainfall and water depth patterns in the baseline hydrological period of 1993 through 1999.

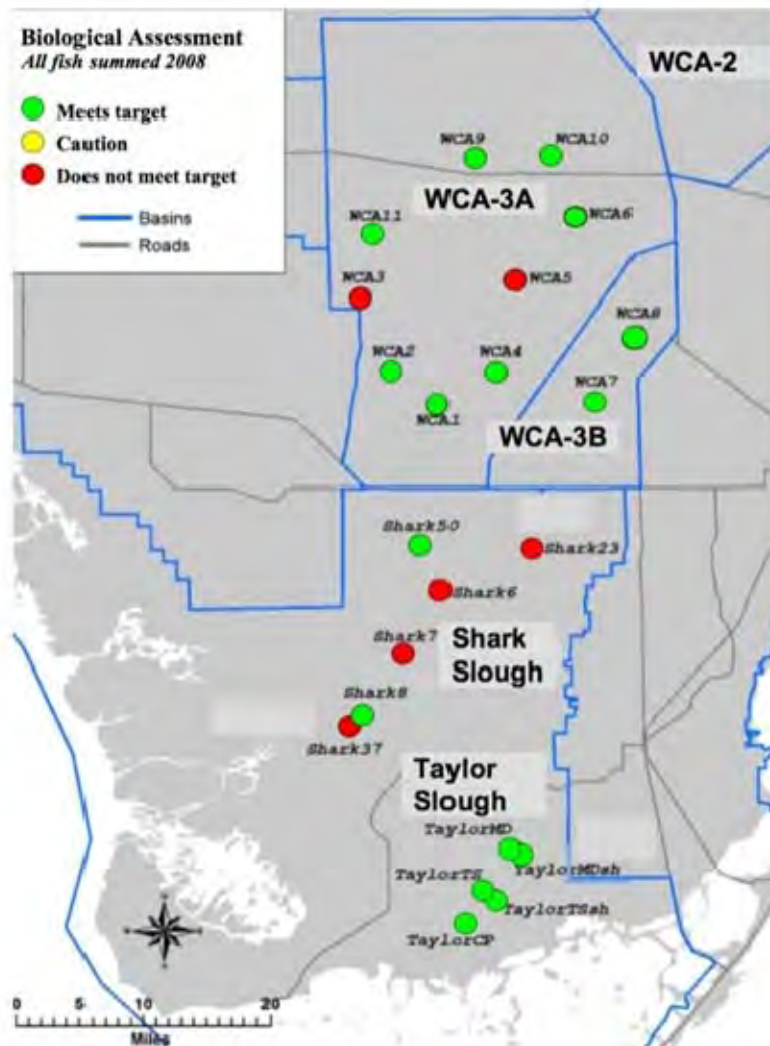
After several years of concern in Taylor Slough, all indicators except non-native fish were within desirable ranges. Results were mixed in WCA-3A, where two sites yielded fewer fish than expected based on rainfall, but seven others were within desired ranges, as were both monitoring sites in WCA-3B. This long-term monitoring program indicates that water management was closer to targets in 2007 and 2008 than in years 2001 through 2006. Monitoring data indicate that non-native taxa continue to be most common at edge habitats, though widespread in Everglades marshes, and their frequency may be increasing in Taylor Slough. This trend should receive further attention.

Key Findings

1. All of the sites coded red for fish density resulted from fewer fish than expected based on observed rainfall, and most are in Shark River Slough.
2. Taylor Slough showed an improvement in 2007 and 2008 compared to previous years (2001-2006).
3. Results were mixed in WCA-3A, though the overall assessment is acceptable (green). There was evidence of more frequent drying than expected from observed rainfall in the western area. Everglades crayfish were infrequently collected in WCA-3A in the baseline period and afterwards.
4. There were no systematic deviations from rainfall-based expectations in WCA-3B for all fish summed.
5. Non-native fish are generally 2% or fewer of the fishes collected at all monitoring sites. However, higher numbers, particularly of Mayan cichlids, have been noted at the mangrove edge of Shark River Slough and Taylor Slough, in the Rocky Glades, and in canals in general. In 2008 monitoring sites were added downstream from the C-111 canal in the ENP panhandle, and non-native taxa at times exceeded the 2% cutoff at those sites. There appears to be an increasing trend of non-native taxa in Taylor Slough; several species were present including Mayan cichlids, swamp eels, and spiny eels.

¹The target hydrological years for this assessment include 1993-1999. Forecasting models (statistical models derived by cross-validation methodology) that link regional rainfall to surface water-depth at the monitoring sites were used to model hydrology. Alternative hydrological model outputs, such as those derived by the Natural System Model, generally yield longer target hydroperiods than used here leading to more frequent impacts.

Fish & Macroinvertebrates



The map above shows the location of long-term monitoring sites and reflects annual assessments for the Total Fish performance measure. The table on the following pages reflects the average stoplight score within each region for fish and macroinvertebrates.

Fish & Macroinvertebrates

Performance Measure	'00	'01	'02	'03	'04	'05	'06	'07	Current Status	Current Status	2-Year Prospectus
Shark River Slough											
Eastern mosquitofish	G	G	Y	R	R	Y	Y	R	Y	Fewer than expected.	Two-year prospects are for no change, but Tamiami bridge project should improve this PM in future.
Flagfish	G	G	G	Y	G	G	G	G	G	At expected levels based on rainfall and target-period hydrology.	Two-year prospects are for no change, but Tamiami bridge project should improve this PM in future.
Bluefin killifish	G	Y	Y	R	Y	Y	Y	Y	Y	Fewer than expected.	Two-year prospects are for no change, but Tamiami bridge project should improve this PM in future.
Total fish	G	G	R	R	R	R	R	R	Y	Fewer than expected.	Two-year prospects are for no change, but Tamiami bridge project should improve this PM in future.
Everglades crayfish	G	Y	G	Y	R	Y	Y	Y	G	At expected levels based on rainfall and target-period hydrology.	Two-year prospects are for no change, but Tamiami bridge project should improve this PM in future.
Non-native fishes	Y	Y	Y	Y	Y	Y	Y	Y	Y	Present at all monitoring sites. None more than 2% of all fish collected; numbers highest at mangrove boundary.	Two-year prospects are for possible increase or no change, but Tamiami bridge project may negatively affect this PM.
Taylor Slough											
Eastern mosquitofish	G	G	G	Y	Y	Y	Y	G	G	At expected levels based on rainfall and target-period hydrology.	New projects at S-332 and C-111 should lock in good performance of past year.
Flagfish								G	G	At expected levels based on rainfall and target-period hydrology.	New projects at S-332 and C-111 should lock in good performance of past year.
Bluefin killifish	G	Y	R	R	R	R	R	G	Y	Near, but below, expected levels based on rainfall and target-period hydrology.	New projects at S-332 and C-111 should lock in good performance of past year.
Total fish	G	G	Y	Y	R	R	R	G	G	At expected levels based on rainfall and target-period hydrology.	New projects at S-332 and C-111 should lock in good performance of past year.
Everglades crayfish	G	G	G	Y	R	Y	Y	G	Y	Above expected levels based on rainfall and target-period hydrology.	New projects at S-332 and C-111 should lock in good performance of past year.
Non-native fishes	Y	Y	Y	Y	Y	Y	Y	R	Y	Present at all monitoring sites. None more than 2% of all fish collected; numbers highest at mangrove boundary.	New projects increasing connectivity to canals may negatively affect this PM.

The 2-Year Prospect forecast assumes no large-scale climatological events such as hurricanes with excessive rain or drought during this period.

Fish & Macroinvertebrates

Performance Measure	'00	'01	'02	'03	'04	'05	'06	'07	Current Status	Current Status	2-Year Prospectus
Water Conservation Area 3A											
Eastern mosquitofish										At expected levels based on rainfall and target-period hydrology.	PM should continue at good levels relative to target; DECOMP projects may change area hydrology so much new targets required in future.
Flagfish										At expected levels based on rainfall and target-period hydrology.	PM should continue at good levels relative to target; DECOMP projects may change area hydrology so much new targets required in future.
Bluefin killifish										At expected levels based on rainfall and target-period hydrology.	PM should continue at good levels relative to target; DECOMP projects may change area hydrology so much new targets required in future.
Total fish										At expected levels based on rainfall and target-period hydrology.	PM should continue at good levels relative to target; DECOMP projects may change area hydrology so much new targets required in future.
Non-native fishes										Present at all monitoring sites but no evidence of trends. All less than 2% of total and fewer than in Everglades National Park.	No change is likely, though DECOMP projects will increase access to canals already connected.
Water Conservation Area 3B											
Eastern mosquitofish										At expected levels based on rainfall and target-period hydrology.	Two-year prospects are for no change in this PM or improvement because of DECOMP projects.
Flagfish										Tendency for higher values than expected at northern site.	Two-year prospects are for no change in this PM or improvement because of DECOMP projects.
Bluefin killifish										At expected levels based on rainfall and target-period hydrology.	Two-year prospects are for no change in this PM or improvement because of DECOMP projects.
Total fish										At expected levels based on rainfall and target-period hydrology.	Two-year prospects are for no change in this PM or improvement because of DECOMP projects.
Non-native fishes										Not found at either monitoring site within WCA-3B.	Two-year prospects are for possible increase or no change, but DECOMP projects may negatively affect this PM.