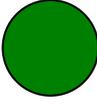
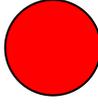
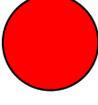
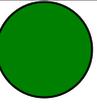
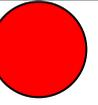
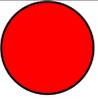
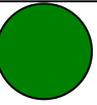
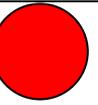
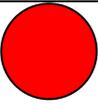
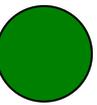
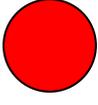
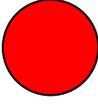
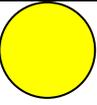
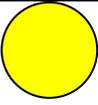
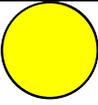
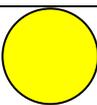
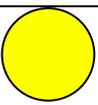
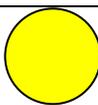
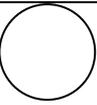
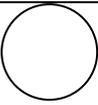
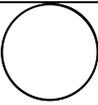
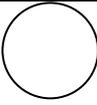
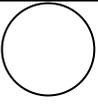
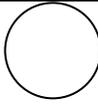


STOPLIGHTS - FISH

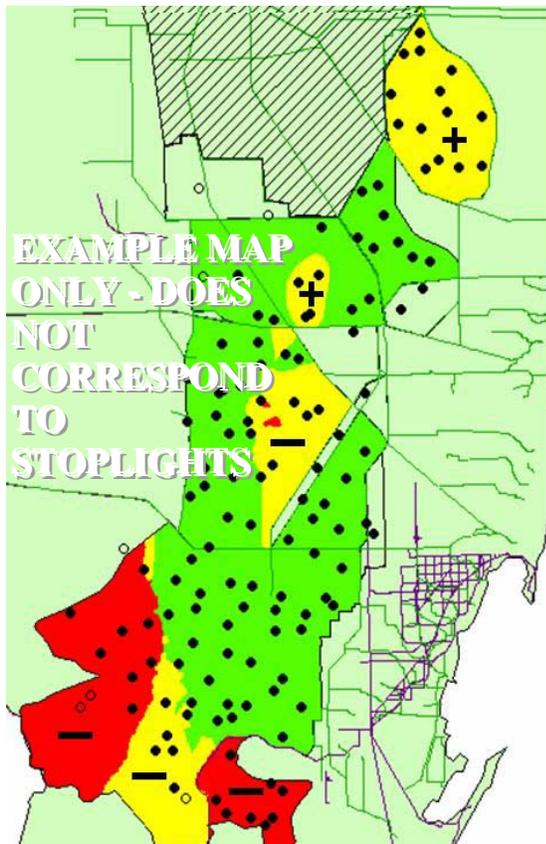
PERFORMANCE MEASURE	LAST STATUS ¹	CURRENT STATUS ²	PROGNOSIS ³	CURRENT STATUS	PROGNOSIS
TOTAL FISH DENSITY TAYLOR SLOUGH				All five monitoring sites in Taylor Slough showed a lower fish density than would be expected based on rainfall. Two sites had deviations indicative of a significant trend of lower fish densities overall. Pre-IOP fish densities were within the green range and Post-IOP fish densities decreased into the red range.	Pre-IOP water conditions were more favorable for fish populations than Post-IOP hydrologic conditions. Without significant changes in water management we expect the lowered fish density to continue. This may be a long term decreasing trend without improvements in water management.
BLUEFIN KILIFISH DENSITY TAYLOR SLOUGH				Bluefin Killifish also displayed a lower than predicted density in all sites in Taylor Slough during the Post-IOP period. This corresponds to several dry-downs that, based on rainfall, should not have occurred under the Pre-IOP water management operations. Killifish are particularly well correlated with water levels and Days Since Rewetting (from a drydown), and are well suited for predicting fish density.	Bluefin Killifish are expected to continue lower than predicted populations as noted above without significant changes in water management (IOP) that has been creating dry-downs that based on rainfall should not have occurred.
TOTAL FISH DENSITY SHARK RIVER SHOUGH				Five of six monitoring sites in Shark Slough showed lower fish density than would be expected based on rainfall. Only site 6 showed no change from Last Status condition or from predictions (green) and it is located such that water management actions have no impact on that site. We consider site six to be an index, or reference, of overall aquatic faunal productivity.	We expect to see the same patterns in fish density for Shark Slough that we found in Taylor Slough (see above) without changes in water management.
BLUEFIN KILIFISH SHARKRIVER SLOUGH				Bluefin Killifish densities were much less than predicted for Shark Slough beginning in July 2001. This corresponds to several dry-downs that, based on rainfall, should not have occurred under the Pre-IOP water management operations.	See Bluefin Killifish noted for Taylor Slough above.
TOTAL FISH DENSITY WATER CONSERVATION AREA 3				Fish density was indistinguishable from rainfall-based expectations at all 11 monitoring sites during the Post-IOP period. However, Pre-IOP and Post-IOP conditions are not consistent with expectations from the historical ecosystem because of ponding in WCA-3A and over-drying in WCA-3B. Both conditions lead to fewer small fish than expected: Ponding supports more predatory fishes and over-drying kills fish.	We expect this area to remain in the yellow light for the foreseeable future, pending action on management programs such as DECOMP.
BLUEFIN KILIFISH DENSITY WATER CONSERVATION AREA 3				Bluefin Killifish density was lower than expected based on rainfall at one monitoring site in western WCA-3A and one in southern WCA-3B. Their density was consistent with expectations at 9 other monitoring sites during the Post-IOP period. Pre-IOP and Post-IOP conditions earned a yellow status because of ponding in southern WCA-3A and over-drying in WCA-3A compared to historical conditions.	We expect this area to remain in the yellow light for the foreseeable future, pending action on management programs such as DECOMP.
TOTAL FISH DENSITY WATER CONSERVATION AREA 1				No information on Loxahatchee at this time.	
BLUEFIN KILIFISH DENSITY WATER CONSERVATION AREA 1				No information on Loxahatchee at this time.	

¹ Last Status Column covers data prior to 2000 – pre IOP period; ²Current Status Column covers data since 2000 – post IOP period;

³Prognosis Column covers expected future condition without changes in water management.

KEY FINDINGS – FISH

SUMMARY FINDING: Fish density was lower than expected—based on rainfall—throughout Shark and Taylor Sloughs since 2000, coinciding with the outset of the IOP water management program. Several dry-downs have occurred that were not predicted from rainfall patterns and appear to have resulted from operation schedules. Starting with each drying event, fish populations decline and remain lower than expected for two or more years. Fish density in WCA-3A and 3B was less affected by IOP than in Everglades National Park. There was a slight increase in fish density consistent with a movement of fish into the area of WCA-3A which held water while the surrounding marshes did not.



- Legend. Standardized difference between Observed Density and Predicted Density. Plus sign = too many fish; minus sign = too few fish. Green is the target range.
- RED + (greater than 0.4)
- YELLOW + (0.2 to 0.4)
- GREEN (-0.2 to 0.2)
- YELLOW – (-0.2 to -0.4)
- RED – (less than -0.4)

KEY FINDINGS:

1. Taylor Slough had the largest decrease in fish density overall.
2. Shark Slough also had statistically significant decreases in fish density at most monitoring sites.
3. The Pre-IOP versus Post-IOP conditions show that fish densities have decreased significantly in much of the southern Everglades because of dry-downs that would not have occurred prior to IOP, as predicted by rainfall.
4. Fish density in Water Conservation Areas 3A and 3B were less affected by IOP, though they are inconsistent with expectations from NSM conditions because of ponding in 3A and drainage of 3B. Fish are more sensitive to drying frequency than water depth, which explains why the high-water conditions of 3A during IOP had little impact.
5. Overall fish densities (and crustaceans) were lower than expected for the much of the 6 year post-IOP period as compared to the Pre-IOP period.

KEY RECOMMENDATIONS:

1. Water management operations in regions that showed significant decreases in fish densities from the expected should be evaluated by managers and hydrologists to determine hydrological operations that would improve fish densities toward target (predicted) levels.
2. Additional water is needed for Taylor Slough; the aquatic fauna there is dramatically changed since implementation of IOP.
3. Implementation of DECOMP should lead to greater densities of small fish in WCA-3A and 3B, and will probably also shift large-fish populations from WCA-3A to 3B.

¹ Last Status Column covers data prior to 2000 – pre IOP period; ² Current Status Column covers data since 2000 – post IOP period;

³ Prognosis Column covers expected future condition without changes in water management.