

# BioView



## A Biological Snapshot of Lake Down June 9, 2006



Figure 1: Site CC9 Lake Down

### Background

Lake Down begins the series of 12 connected lakes called The Butler Chain of Lakes. Measuring roughly 900 acres, it can be considered the head-water of this chain. Geographically, the town of Windermere borders the chain of lakes on the northern side mostly between Lakes Butler and Down. Apopka-Vineland Road is on the east, and State Road 535 borders the chain on the south and west. Lake Down also has its own drainage basin that measures approximately 2,990 acres, while the entire chain is part of the Cypress Creek Basin.

Located in Commission District 1, these lakes make up the headwaters of the Kissimmee River that flow into Lake Okeechobee. The Cypress Creek basin discharges into the Cypress Creek Swamp which then discharges into Bonner Creek. Further downstream, this basin discharges into Reedy Creek which flows into Lake Hatchineha in the Kissimmee River Basin.

In 1984, the Butler Chain of Lakes was been designated an Outstanding Florida Water Body (OFW) according to the Florida Administrative Code 62-302.700(9)(I). This designation serves to help protect the chain for ecological and recreational purposes.

Fig. 3: Aerial View of Lake Down



Fig. 2: Cernotina sp. found in Lake Down

Lake Condition Index (LCI) for Lake Down, Florida	Value
Total Taxa	98
Number of EOT Taxa	58
Percent EOT Taxa	29
Percent Diptera Taxa	54
SWDI	59.8
Hulbert Index Score	69
LCI Score	61
Lake Type	Alkaline
Interpretation of Score	Very Good

## Results Summary

For this sampling event, Lake Down, had a Lake Condition Index Score (LCI) of 63 which is interpreted to have a very good rating. A habitat assessment was performed on the site with the score of 72 out of 120 total points. The purpose of the habitat assessment is to have physical components to help determine if water quality or habitat disturbance is to blame for any impairments in the health of a biological community.

This assessment showed that although the secchi depth was in the optimal zone (3.6 m), it scored poorly in other parameters such as upland buffer zone and lakeside alterations due to development. Lake Down has a sediment composition primarily of sand and muck, with submerged aquatic vegetation and coarse particulate organic matter (CPOM). There was also evidence of slight silt smothering in this composition. The types of vegetation found were *Nitella* sp., *Chara* sp. and *Hydrilla* sp. .

The biological analysis of Lake Down suggests a very healthy macroinvertebrate community dominated by the Trichopteran genus, *Cernotina* (25%). Out of 104 organisms, 30 taxa were present. Only one Ephemeroptera taxa was found, *Hexagenia* sp. This order includes mayflies which are indicators of very good water quality and are sensitive to pollutants. The genus *Hexagenia* is a burrowing mayfly found in lake bottoms (Fig. 4).



Fig 4: *Hexagenia* sp. found in Lake Down

And is an indicator of excellent water quality. They are sensitive to the amount of dissolved oxygen in the water body. The dominant taxa, *Cernotina*, is member of the order Trichoptera; commonly known as caddisflies.

## Conclusion

The health of the macroinvertebrate community in Lake Down was considered to be very good by the Florida LCI index score of 63. This number is 10 points higher than the LCI score it received in 2004. This could suggest improvement in biological populations.

One noticeable observation of lake bottom composition from past sampling events, is the decrease in submerged aquatic vegetation, especially that of the *Nitella* sp.. Lake Down is chemically treated for the invasive species *Hydrilla* on a regular basis, which may have some impact on those and other aquatic plant populations.

Overall, the macroinvertebrate community of Lake Down showed good diversity with a Shannon-Wiener Diversity Index of 2.63. and Hulbert Index score of 13. Only 50% of the sample were identified to be in the Diptera order. Although there were only 3 EOT (Ephemeroptera, Odonata, Trichoptera) taxa, found, the mayfly *Hexagenia* sp. indicates that Lake Down is maintaining its very good water quality standings.

## References

- Water Quality Model and Lake Management Plan for the Butler Chain of Lakes. 1998. Parson Engineering Science.
- Windermere Chain of Lakes-Lake Butler and Lake Down Initial Assessment of Water Quality. 2002. Orange County Environmental Protection Division.

Table 2: Water Chemistry for Lake Down (CC9) 6/09/06

TC CFU/100 mL	FC CFU/100 mL	Chla (ug/L)	Color (PCU)	Turbidity (NTU)	TP (mg/L)	TN (mg/L)	TKN (mg/L)	NH3 (mg/L)
2	1U	1.5	10	0.7	0.007	0.36	0.36	0.02