

**Draft: Bone Lake, Polk County
Endothall Concentration Monitoring Summary, 2013**

17 December 2013

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Bone Lake has an area of 1667 acres, a maximum depth of 43 ft and a mean depth of 23 ft. On 7 and 10 June 2013, a number of areas totaling 31.43 acres were treated with a liquid formulation of endothall (Aquathol K) to control curly-leaf pondweed (*Potamogeton crispus*) (Figure 1).

The endothall was applied at a target concentration of 2000 ug/L (2.0 mg/L) active ingredient (ai). Endothall application rates are specified as active ingredient (ai) in the product label, while endothall chemical analysis is specified as acid equivalent (ae). A concentration of 2000 ug/L ai is equal to 1420 ug/L ae. Water sample sites were established in treatment areas B5, B6-A, B6-B, B6-C, B7-B, and B8 to monitor endothall concentrations and exposure times (Figure 2). An additional sample site (B-1) was located between treatment areas B7-B and B8 to monitor endothall movement between the treatment areas, and another site was located on the north end of the lake near wild rice beds. Treatment areas were less than 5 acres, and water temperature, wind direction, and wind speed were recorded.

Treatment Site	Treatment Area, acres	Mean Depth, ft	Treatment Date	Water Temps, F	Wind Speed, mph	Wind Direction
B5	3.26	8.2	06/10/13	62.9	2	WNW
B6-A	3.17	6	06/07/13	58.3	1	W
B6-B	3.52	6	06/07/13	58.3	1	W
B6-C	2.44	6	06/07/13	58.3	1	W
B7-B	4.86	7	06/10/13	62.9	2	WNW
B8-1	4.1	6	06/07/13	58.3	1	W

Water samples were collected from each sample site using an integrated water sampler which collects water from the entire water column. Water samples were collected at intervals of approximately 1, 2, 3, 4, 7, 9, 24, and 48 hours after treatment (HAT) at all sample sites except for the site (BR1) near the wild rice beds. Water samples were collected at sample site BR1 at intervals of 1, 2, 3, 5, 7, and 14 days after treatment (DAT). Samples were taken to shore after completion of each sample interval, and 3 drops of muriatic acid were added to each sample bottle to fix the endothall and prevent degradation. Samples were then stored in a refrigerator, until shipped to the US Army Engineer Research and Development Center (ERDC) laboratory in Gainesville, FL for analysis of endothall.

Endothall concentrations in samples collected from treatment area B5 ranged from 115 to 744 ug/L at 1 to 4 HAT compared to the target concentration of 1420 ug/L ae (Figure 3). All concentrations were less than a base line concentration of 100 ug/L ae by 6 HAT.

Peak endothall concentrations in samples collected from treatment areas B6-A, B6-B, and B6-C ranged from 751 to 1271 ug/L ae compared to the target concentration of 1420 ug/L ae (Figure 3). Endothall concentrations were less than a base line concentration of 100 ug/L ae by 24 HAT

at site B6-B and B6-C and by 71 HAT at site B6-A. Endothall may have moved over sit B6-A from sites B6-B and B6-C accounting for the longer exposure time.

Peak endothall concentrations in samples collected from treatment areas B7 and B8 ranged from 287 to 795 ug/L ae compared to the target concentration of 1420 ug/L ae (Figure 4). Endothall concentrations were less than a base line concentration of 100 ug/L ae by 10 HAT. No samples collected from B-1 exceeded 100 ug/L ae. Endothall concentration in all samples collected from sample site BR1 near the wild rice beds were less than the detection limit.

Figure 1. 2013 Bone Lake Endothall Treatment Areas

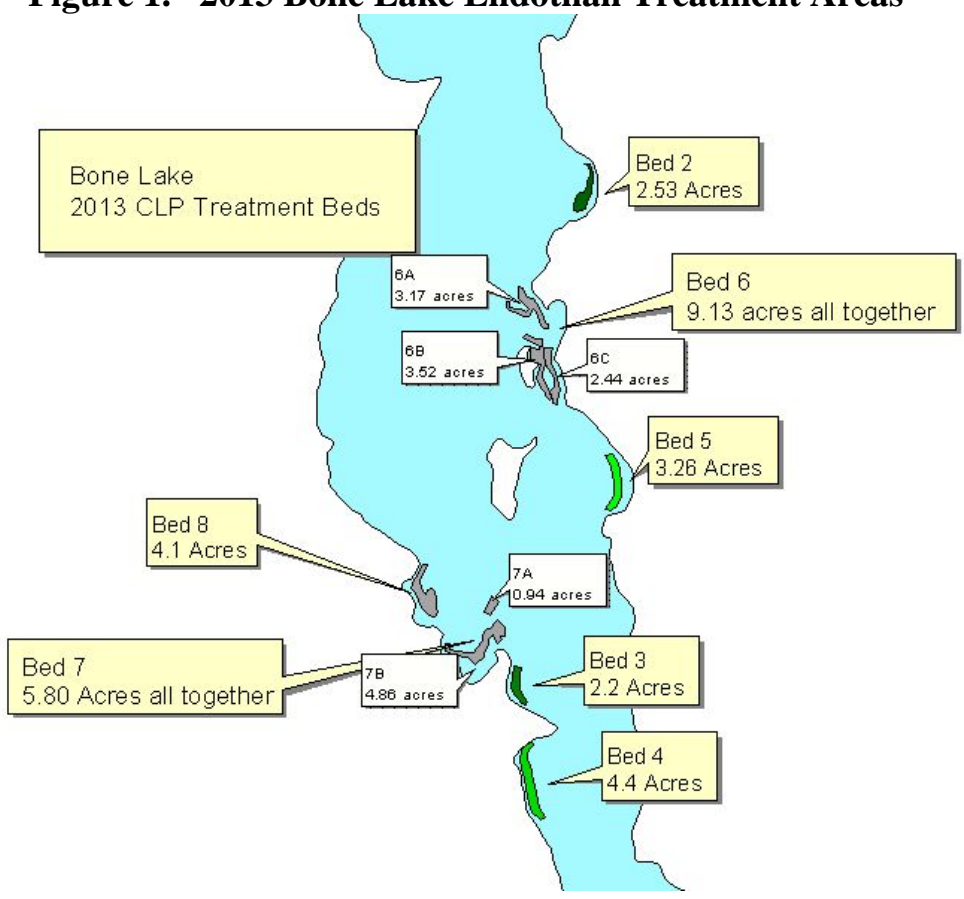
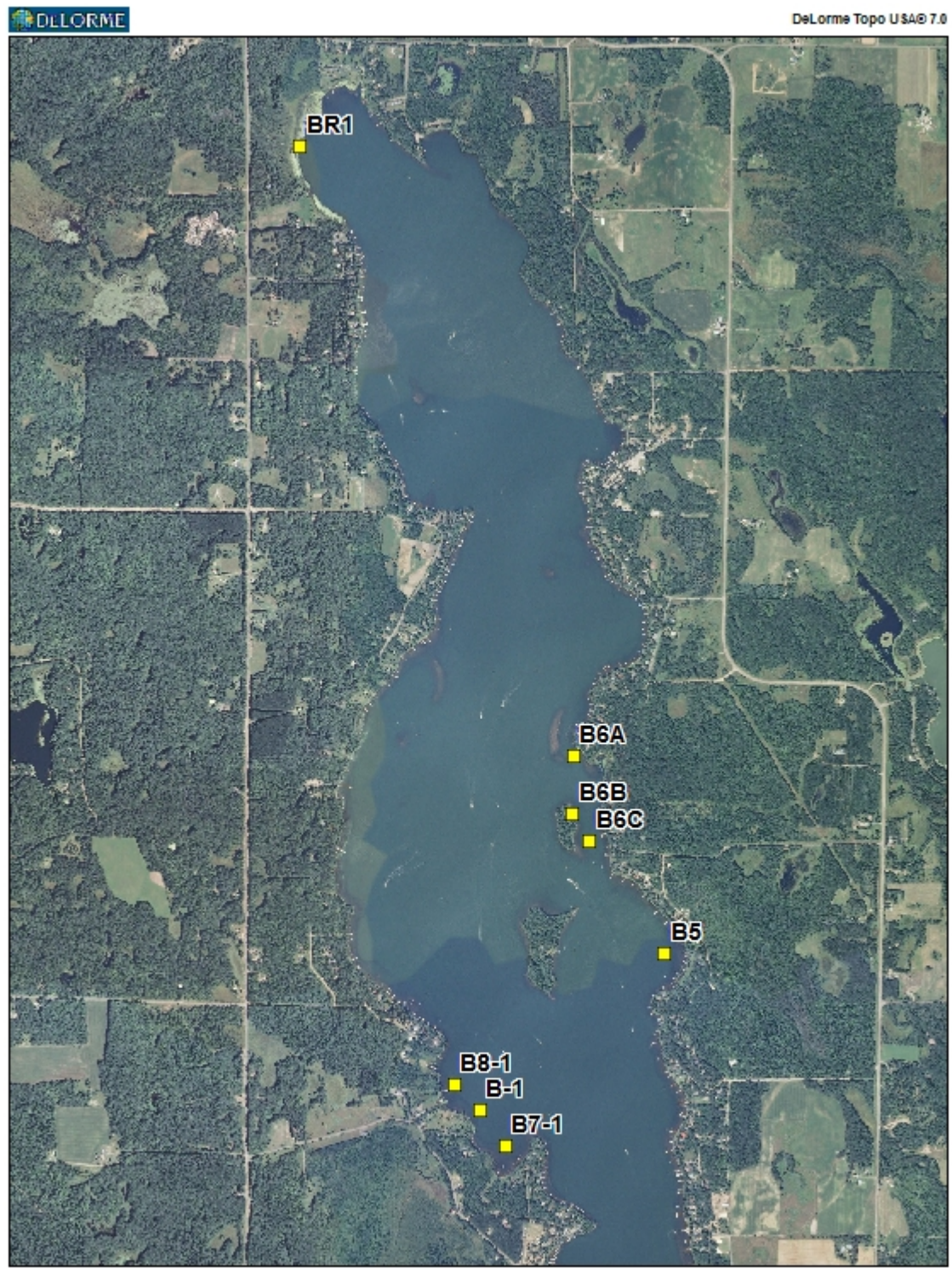


Figure 2. 2013 Bone Lake Endothall Water Sample Sites



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MN (0.4° W)



Data Zoom 13-0

Figure 3

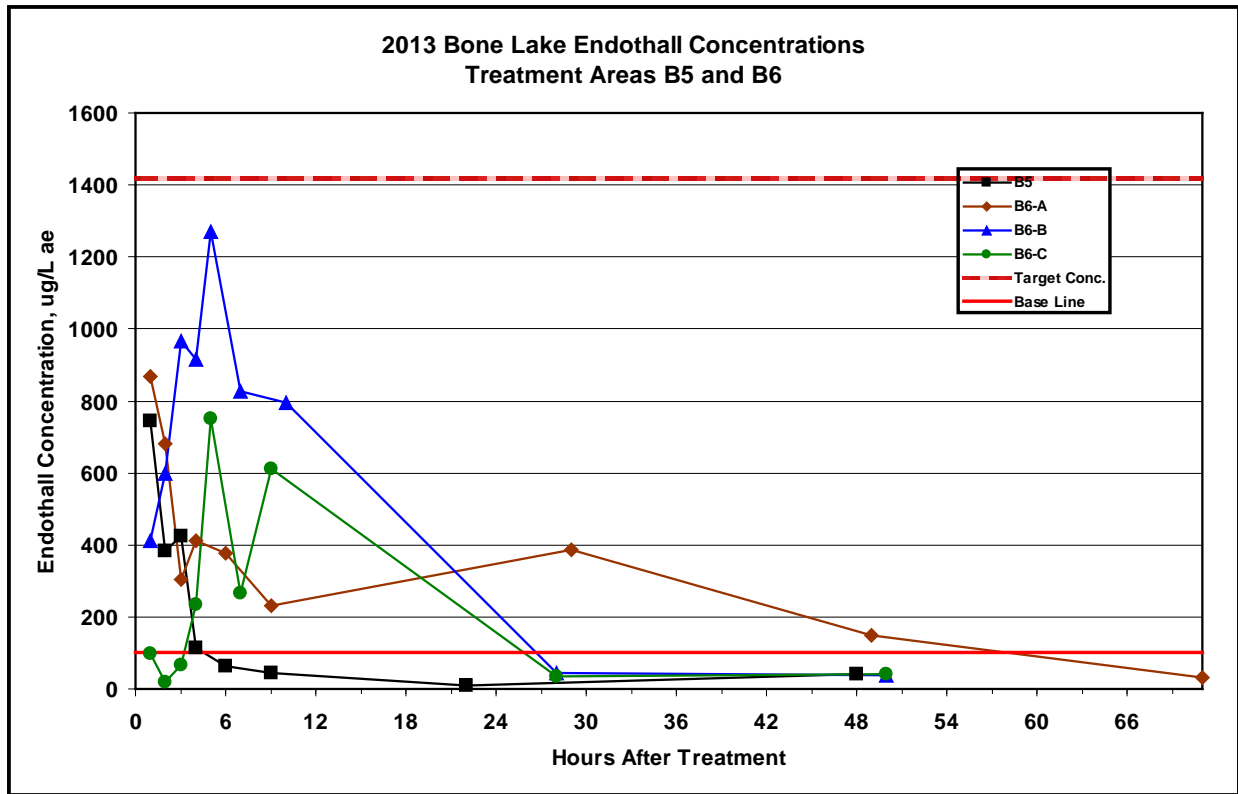


Figure 4

