

**Draft: Chetac Lake, Sawyer and Barron Counties,
Endothall Concentration Monitoring Summary, 2013**

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Chetac Lake has an area of 2690 acres, a volume of 37101 acre-ft, a mean depth of 13.8 acres, and maximum depth of 28 acres. On 28 May 2013 an area on the north end of Chetac Lake (97.5 acres) was treated with a liquid formulation of endothall (Figure 1) to control curlyleaf pondweed (*Potamogeton crispus*). The target concentration (application rate) was 1.5 mg/L active ingredient (ai). Water sample sites were established at 6 locations to monitor endothall concentrations. Three sites (BC1, BC2, BC3) were located in the endothall treatment area to quantify the concentration, exposure time. Three additional sites (BC5, BC6, BC7) were located outside of the treatment area to detect possible drift of endothall into key non target areas. Site BC5 and BC6 were located near a known wild rice bed (*Zizania* sp), and Site B7 was located in a designated untreated reference area. A smaller treatment in an area near the boat ramp was canceled, and the accompanying sample location, BC4, was removed.

Water samples were collected using an integrated water sampler which collects a water sample from the entire water column. Water samples were collected at intervals of approximately 1, 3, 6, 9, 24, 48, 72, and 120 hours after treatment (HAT). 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 herbicide and prevent degradation. Samples were then stored in a refrigerator, until shipped to the ERDC laboratory in Gainesville, FL for analysis of endothall. Endothall application rates are based on mg/L active ingredient (ai), while herbicide concentrations in water samples are reported as mg/L or ug/L acid equivalent (ae). An endothall concentration of 1 mg/L ai is equal to 0.71 mg/L ae and 710 ug/L ae.

Peak endothall concentrations in the treatment areas occurred at 1 to 3 HAT and ranged from 1573 to 2530 ug/L ae compared to the target concentration of 1060 ug/L ae (1500 ug/L ai) (Figure 3). The mean endothall concentration in the treatment area ranged from 1119 to 1133 ug/L ae from 6 to 9 HAT, similar to the target concentration (Figure 4). Mean endothall concentrations in the application area declined to 597 ug/L ae by 24 HAT and remained approximately steady through 72 HAT. Mean endothall concentrations in the treatment area declined to less than 100 ug/L HAT by 72 HAT. All endothall concentrations at sample sites located outside the treatment area (B5, B6, B7) were less than the official endothall detection limit of 10 ug/L ae.

Mean endothall concentrations in the treated area dissipated to low levels by 120 HAT (<100 HAT). For comparison, mean herbicide concentrations dissipate in micro treatment areas (< 5 acres) to similar concentrations (< 100 ug/L ae) in 1 to 6 HAT. Conversely mean herbicide concentrations in whole lake treatments degrade to similar concentrations in 14 to 35 days after treatment (DAT). The large treatment area size, and protected bay, block treatment configuration likely contributed to the much longer exposure time compared to smaller micro treatments.

Figure 1. Chetac Lake 2013 Endothall Treatment Areas

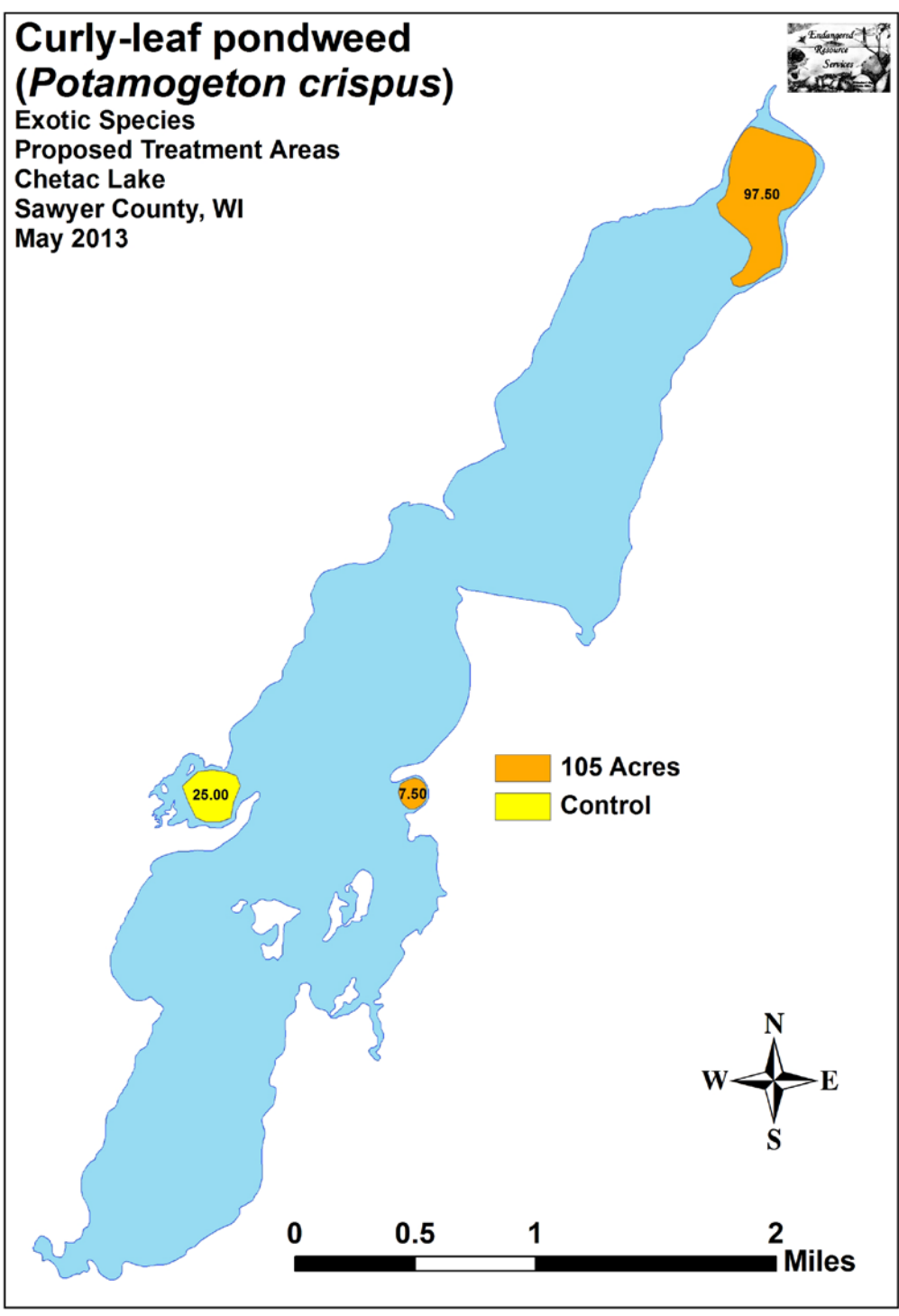


Figure 2. Chetac Lake 2013 Endothall Sample Locations

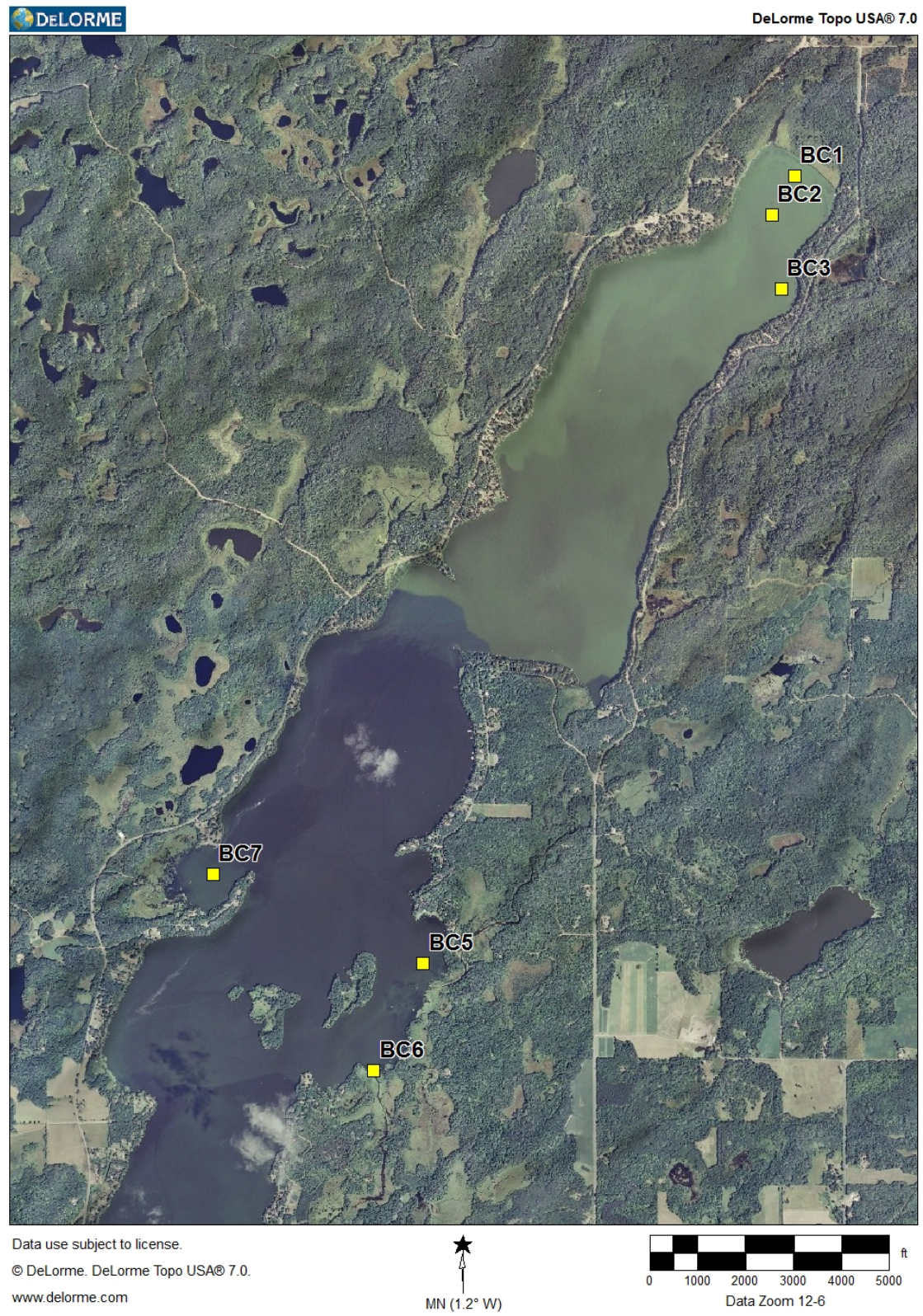


Figure 3

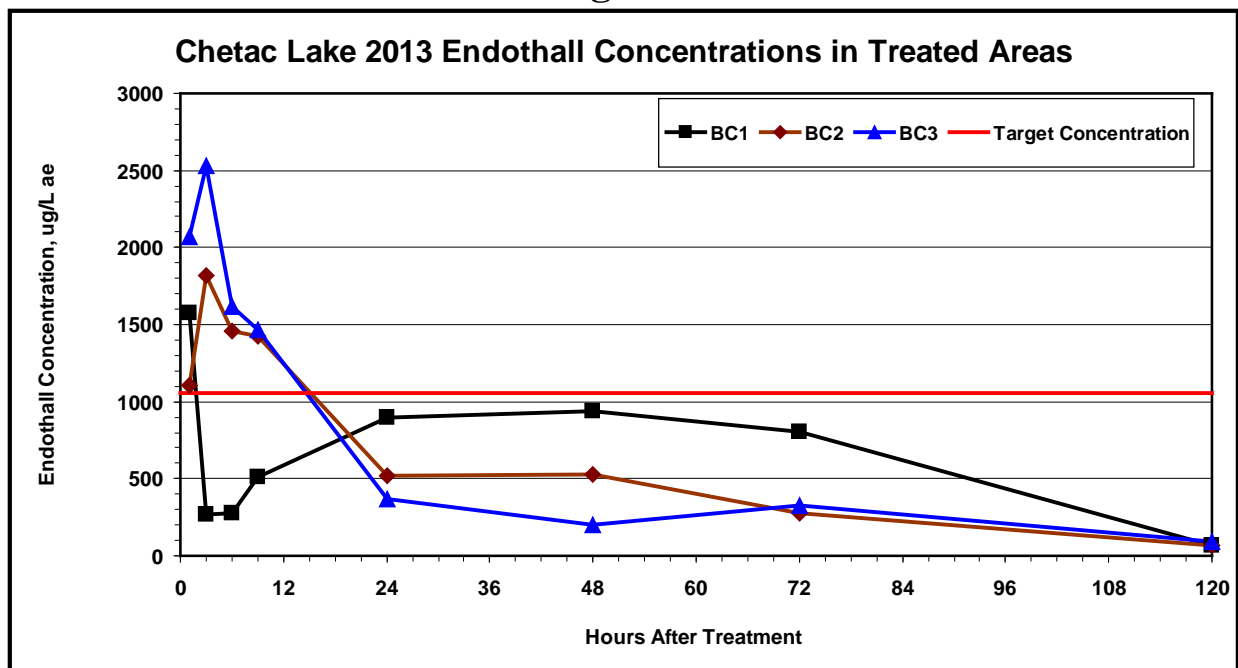


Figure 4

