Ecological Solutions, Inc.
1 Hillside Road, P.O. Box 193, Conyngham, PA 18219 888-433-3267

Hemlock Farms Community Association

Annual Lake Manager's Report (2008)

In 2008, Ecological Solutions, Inc. (ECS) visited the thirteen (13) lakes and ponds within the Hemlock Farms Community Association from May through October and performed their monthly monitoring activities. During each visit the following tasks were performed:

1. Water Quality Monitoring

During each visit the lakes were sampled from the deepest location within the lake. Field measurements taken during each monitoring event included: temperature, dissolved oxygen, and water clarity (measured with a Secchi disk). In addition, a surface water sample was collected for lab analyses that include phosphorus, nitrogen, alkalinity, and hardness.

In general, the results of the water chemistry showed average surface and bottom water temperatures throughout the season. The lakes completed their stratification process in May and started the process of fall turnover in September. The dissolved oxygen profiles were within normal limits and there was no concern about the amount of available oxygen for fish populations. According to the data represented in *Table 1*, the highest dissolved oxygen concentrations were reached in the month of May in the 2008 monitoring season. In addition, pH values were considered normal. These values remained constant throughout the sampling period. Therefore, acidic conditions were not a concern within the lake systems.

Water clarity ranged from average to above average during each site visit. The secchi depth measurements remained greater than 1 meter (3.3 feet) throughout the management program. The only exception was a recorded measurement of 0.6 meters in May on Willow Pond. The lakes maintained low water hardness and sensitivity to acid rain is low. Overall, the nitrogen concentrations within the lakes remained relatively low. Phosphorous levels fluctuated significantly in the lakes and ponds within the community during the five (5) month sampling period. It is not uncommon to have fairly high phosphorous levels within this region of the state during the summer months.

2. Detailed Observations

Bluestone

Bluestone Pond received its first algae bloom in May in response to high phosphorous levels. A treatment was completed on May 28, 2008 using a tank mixture of Cutrine and Reward to combat both the algae bloom and water star grass growth. This growth receded in June only to return in July. A treatment was completed on August 4, 2008 utilizing a tank mixture of Cutrine and Reward to treat a heavy algae bloom and an unidentified submerged weed. In addition, a water lily treatment was completed. However, the treatment was not very effective in reducing these small patches of lilies. Later in the month of August the unidentified submerged weed was observed to be brown and floating on the surface. ECS felt that the treatment was successful and the mats would not have been floating on the surface if a rain event had occurred, allowing the material to flush out of the system. The phosphorous levels gradually decreased and further treatments were not needed. ECS will treat the water lilies in early spring of 2009 with a systemic herbicide (Navigate).

Mirror

Filamentous algae mats did not appear on the pond until the end of June. However, phosphorous levels were not considered to be high until September. The pond likely contains internal cycling of nutrients is most likely the cause of the algae blooms. Additional factors contributing to the algae blooms were lack of rain and lack of wind driven mixing of the water column. The first algae treatment was completed on June 25, 2008 using a tank mix of Cutrine and water in a backpack sprayer. The algae had receded in July but approximately 10% of the pond surface contained brown algae mats on the surface. No new growth was observed on the surface until September. However, due to no flow conditions and likely low dissolved oxygen, it was not suitable to conduct a treatment. The water lilies will be monitored closely in the 2009 season. A water lily treatment may need to be completed. In addition, microbes may be applied monthly to control the algae. The microbes out-compete the algae for the nutrients within the pond and essentially the algae starves and dies off.

Willow

On May 20, 2008 a filamentous bloom was observed growing from the bottom. A tank mix of Cutrine and water was applied to the surface on May 28, 2008. The treatment appeared to be successful. However, during this visit, water star grass was observed growing approximately 1-2 feet below the surface. A naiad, bladderwort, water star grass, and filamentous algae treatment was completed on June 25, 2008, when conditions degraded significantly. A tank mix of Cutrine and Reward was sprayed evenly over the surface. When ECS returned in July, the submerged weeds were absent and a minor algae bloom had formed on the surface in mats. No flow conditions were observed on September 2, 2008 causing an iron bacteria film and algae on the surface. Due to the conditions, a treatment was not completed because anoxic conditions could result.

A spatterdock treatment may need to be completed in 2009. It is necessary to keep the pond free of vegetation to allow for flow through the pond. Therefore, artificial fish structure may need to be installed.

McConnell

ECS did not observe excessive algae or plant growth during the early part of the growing season. Similar conditions were observed on June 25, 2008. Dense weed beds were observed in approximately 15 acres of the lake in July. A tank mix of Cutrine and Reward was applied. In addition, homeowner's docks were spot treated for water lilies. ECS considered the treatment a success in September when no remnants of the weed beds could be seen. During the September visit, large schools of juvenile panfish were observed feeding on zooplankton within the Laurel Ridge area of the lake. The lake had a spike in phosphorous levels from August through September. This spike is mostly likely due to internal nutrient cycling within the lake. No water was observed going over the dam at this time. The phosphorous levels returned to normal by the end of September. ECS will treat phragmites and cattails in the Laurel Ridge and boat launch areas in 2009. In addition, the water lilies near homeowner's docks will be monitored closely.

Rockwood

Bladderwort was observed growing from the bottom in dense mats as early as May within this pond system. ECS treated the bladderwort on June 25, 2008 when the bladderwort had reached the surface. The chemicals (Reward and Cutrine) were used because they are contact herbicides and would provide the fastest results. This treatment was not successful because access to the pond was limited and the treatment had to be conducted from a canoe with a backpack sprayer. ECS later received permission from a homeowner to access the pond. On August 4, 2008, the pond was re-treated using our spray boat. ECS observed a decrease in water elevation during the August monitoring visit. At this time, high phosphorous levels were observed in the pond. These levels were most likely caused by internal cycling of nutrients. By the end of September the water level in the pond had increased and phosphorous levels stabilized.

Rimrock

Bladderwort was observed growing six (6) inches from the bottom of the pond on the May 28, monitoring visit. The bladderwort was treated on June 25, 2008 using a tank mix of Cutrine and Reward. A total of 3 acres was treated. By July the bladderwort was brown and fragments were observed floating on the surface. In addition, the phosphorous level was elevated due to stagnate conditions within the pond system. The pond was absent of bladderwort by early September and the water clarity had increased to almost 7 feet. A flock of 12 Canadian geese were observed on the pond. Overall, the condition of the pond was good. The pond remained absent of weeds and algae throughout the remainder of the monitoring season. ECS

Recommends treating the cattails along the western shoreline to provide access for shoreline fishing. In addition, less invasive plant species should be installed to provide better habitat for fish.

Ledgeway

On May 28, 2008, ECS observed water lilies beginning to surface on the pond. In addition an area of phragmites (common reed) approximately 0.20 acres was located along the western shoreline. By the end of June the water lilies had surfaced and areas of bladderwort were growing 6 inches from the bottom of the pond. On July 28, a water lily and phragmites (common reed) treatment was completed and by July 30, the water lilies were beginning to brown. The bladderwort was observed 6 inches from the surface in areas treated for lilies. Also, the pond had lost more than a foot of depth. The bladderwort never reached the surface of the pond throughout the monitoring period. The water clarity was never less than 3.6 feet. White water lilies will be monitored closely in the 2009 growing season.

Little Bell

Very little vegetation was observed in the pond throughout the monitoring period. A small patch of water star grass was observed in the western corner of the pond in the month of June. In July, Naiad was observed growing approximately 6 inches from the bottom of the pond. During the September monitoring both algae and naiad were observed growing on the bottom of the pond. However, none of this vegetation reached the surface and was creating any access problems to the pond. Also, due to the lack of structure within the pond, the vegetation provided fish cover. Therefore, a treatment was not completed this season. Water clarity was excellent throughout the monitoring period. Sunlight reached a minimum of 5 feet throughout the 5 month sampling period. The pond contained high phosphorous levels in the month of September. This was mostly likely caused by the fall turnover of the pond.

Elm

ECS did not observe an algae bloom or excessive plant growth on the lake during the five (5) month monitoring period. The nutrient levels within the lake have remained steady throughout the monitoring period with the exception of June. A spike in phosphorous levels occurred on June 25th. The water clarity within this lake is excellent and ranged from 9 feet to 15 feet. Several painted turtles, snapping turtles, and waterfowl were commonly seen on the lake. The beach seemed to be the most frequently used of all the lake beaches in the community.

Hemlock

The first sighting of any vegetation was on July 30, when a few patches of white water lily were observed in the southern coves. There were a few reports of algae on the lake in the month of July, but the water clarity was more than 5.5 feet. However on August 13, 2008 a planktonic algae bloom was observed by the Little Camp beach area. A treatment was not conducted until August 18, 2008 due to problems getting enough algaecide and threats of thunderstorms. A total

Of 275 pounds of Copper Sulfate was applied. In September the nutrient levels returned to normal and the lake did not have another algae bloom during the monitoring period.

ECS did not treat the water lilies on the lake because they were not hindering boat access. Also, the lilies provided some cover and helped maintain cooler temperatures for fish in an otherwise barren area.

Lower Hemlock

Unlike previous years nuisance algae blooms were not a problem this season. Only one algae treatment needed to be conducted during the 2008 season. This algae bloom occurred on August 13, 2008. ECS completed an algae treatment on August 18, 2008 using 50 pounds of Copper Sulfate. On September 2, 2008 a minor planktonic algae bloom was occurring. It was later determined that this algae bloom was the remnants of algae flushing in from Hemlock Lake. Nutrient levels decreased in early September and returned to normal by the end of September.

Saddlebrook

ECS did not need to conduct any algae or herbicide treatments on the pond during the 2008 monitoring season. The pond contained elevated phosphorous levels from July through September. However, water clarity remained steady at 5 feet. ECS concluded that this algae bloom provided cover and helped maintain cooler temperatures for the exceptional bass population within the pond. Largemouth bass flourish in slightly nutrient loaded bodies of water. Several patches of phragmites (Common Reed) will need to be treated during the 2009 season.

Little Camp

The pond continually contained patches of filamentous algae throughout the monitoring period. After conducting monthly monitoring on this pond, it was concluded that the pond remains stagnate throughout the summer due to shallowness and lack of wind mixing. The pond contains little structure for fish habitat. The majority of fish caught in the pond are less than two (2) inches in length. Therefore, any vegetation within the pond is important for fish cover. An algae treatment was conducted on June 4, 2008 because the alga was covering approximately 50% of the surface. In addition, cattails were treated along the southern shoreline using a backpack sprayer with the chemical Reward. The nutrient levels within the pond remained steady throughout the monitoring period with the exception of a spike at the end of July. The pond has excellent water clarity. The bottom could clearly be seen on each visit. ECS recommends planting the southern shoreline with an aesthetically pleasing emergent plant (Pickerelweed) to provide better fishing access. This plant would also provide better fish cover.

A summary chart has been attached showing cumulative treatment and monitoring results thus far in 2008. If you have any questions regarding any aspect of this report, please do not hesitate to contact us.

Sincerely,

Jessica Demusz

Jessica Demusz
Environmental Scientist

Attachments:

- Overall Summary

Lake/Pond	Date	Surface Temp (°C)	Surface D.O. (mg/l)	pH	Turbidity (FTU)	Nitrates (ppm)	Phosphates (ppm)	Alkalinity/Hardness (ppm)	Secchi (m)	Conductivity (um/hos)	Treated (Y/N)	Chemical Used	Amount Applied (gal/lbs.)	Comments
Elm	5/28/08	19.9	9.18	7.2	2	0.10	0.37	12/NA	2.7	150	N	NA	NA	No algae or weeds were observed on the lake surface.
Elm	6/23/08	25.7	8.5	7.6	0	0.08	2.72	12/28	5	140	N	NA	NA	No algae or weeds were observed on the lake surface.
Elm	7/30/08	29.1	7.51	7.3	4	0.19	0.09	NA	3.2	130	N	NA	NA	No algae or weeds were observed on the lake surface.
Elm	9/2/08	26.7	7.8	7.6	0	0.13	0.61	20/32	4.1	120	N	NA	NA	No algae or weeds were observed on the lake surface.
Elm	9/30/08	19.4	NA	7.2	0	0.04	0.45	16/32	4.7	120	N	NA	NA	No algae or weeds were observed on the lake surface.
Hemlock	5/28/08	18.7	9.75	7.2	6	0.23	0.88	16/NA	1.9	140	N	NA	NA	No algae was observed in past nuisance areas.
Hemlock	6/23/08	25.6	8.19	7.4	0	0.13	2.22	20/32	1.3	130	N	NA	NA	Water lilies beginning to surface in southern coves.
Hemlock	7/30/08	29.8	8.89	7.6	13	0.09	0.69	NA	1..8	110	N	NA	NA	No alga was observed in cove areas.
Hemlock	8/18/08	NA	NA	NA	NA	NA	NA	NA	NA	NA	Y	Copper Sulfate	275 lbs.	A heavy bloom of Oscillatoria algae.
Hemlock	9/2/08	26.3	81.4	7.7	2	0.13	0.15	24/32	1	120	N	NA	NA	No alga was observed on the lake surface.
Hemlock	9/30/08	17.3	NA	7.3	2	0.14	0.03	24/40	1.2	110	N	NA	NA	No Oscillatoria algae observed on the lake surface.
Lower Hemlock	5/28/08	19.2	9.24	7.3	4	0.17	0.91	16/NA	2.5	120	N	NA	NA	No alga was visible on the surface.
Lower Hemlock	6/23/08	26.5	8.69	7.5	11	0	0.83	20/36	1.3	130	N	NA	NA	No alga was visible.
Lower Hemlock	8/18/08	NA	NA	NA	NA	NA	NA	NA	NA	NA	Y	Copper Sulfate	50 lbs	A heavy bloom of Oscillatoria algae.
Lower Hemlock	9/2/08	26.4	7.67	8	1	0.05	0.09	32/32	1.2	120	N	NA	NA	No algae or weeds were visible on the surface

Lower Hemlock	9/30/08	17.3	NA	7.3	2	0.08	0	24/40	1.4	100	N	NA	NA	A slight Oscillatoria algae bloom was visible on the surface but water clarity was still very good.
Saddlebrook	5/28/08	21.0	8.58	7.1	2	0.11	0.04	8/NA	2 (bot)	100	N	NA	NA	No algae or weeds visible
Saddlebrook	6/23/08	26.1	8.33	7.5	3	0.08	0.49	16/20	1.4	100	N	NA	NA	No algae or weeds visible.
Saddlebrook	7/30/08	30.5	8.34	8	5	0.07	2.89	NA	1.5 (bot)	100	N	NA	NA	No algae or weeds visible
Saddlebrook	9/2/08	26.4	9.33	7.6	0	0.04	0.94	16/32	2 (bot)	90	N	NA	NA	Observed a small planktonic bloom on the surface.
Saddlebrook	9/30/08	17.7	NA	6.9	6	0.07	1.01	20/32	1.5	70	N	NA	NA	Observed a small planktonic bloom on the surface.
Little Camp	5/28/08	22	12.13	7.4	8	0.1	0.37	8	1.5 (bot)	160	N	NA	NA	Filamentous algae on surface. Will treat on next visit.
Little Camp	6/4/08	25.1	10.33	8.2	N/A	N/A	N/A	N/A	1.2	170	Y	Cutrine Reward	2.5 Cutrine 1 qt. Reward	Reward was used on cattails where fishing takes place and Cutrine was used on filamentous algae mats.
Little Camp	6/23/08	26.3	8.58	7.4	2	0.08	0.24	20/40	1	170	N	NA	NA	Algae has cleared up from previous treatment. Some bladderwort in small patches.
Little Camp	7/30/08	29.8	12.95	8.2	0	0.03	1.99	NA	1.1 (bot)	150	N	NA	NA	Very small area of filamentous algae on surface.
Little Camp	9/2/08	27.2	9.87	8.1	0	0.09	0.07	20/36	1.1	150	N	NA	NA	Very small area of filamentous algae on surface.
Little Camp	9/30/08	16.3	NA	7.2	0	0.14	0.09	20/36	1.1	130	N	NA	NA	Filamentous algae growing on bottom.
Rockwood	5/28/08	20.5	8.63	7.4	7	0.12	0.23	8/NA	2 (bot)	30	N	NA	NA	Bladderwort was heavy on the bottom and some mats are starting to form.
Rockwood	6/23/08	25.0	7.84	7.7	0	0.00	0.15	16/24	2	30	N	NA	NA	Bladderwort needs to be treated on next visit.
Rockwood	6/25/08	NA	7.53	NA	NA	NA	NA	NA	NA	NA	Y	Cutrine Reward	1 Reward 0.75 Cutrine	Treated bladderwort
Rockwood	7/30/08	30.4	8.42	7.3	11	0.17	0.45	NA	bottom	30	N	NA	NA	Bladderwort if floating on the surface. 75% coverage.
Rockwood	8/4/08	NA	NA	NA	NA	NA	NA	NA	NA	NA	Y	Cutrine Reward	1.5 of each	Treated floating bladderwort and brown algae.
Rockwood	9/2/08	25.2	7.23	7.6	6	0.05	1.69	20/28	1.5	40	N	NA	NA	No weeds or algae visible. Water has dropped 1 foot since the spring.

Rockwood	9/30/08	NA	NA	7.3	22	0.07	>3.00	20/28	1.5	30	N	NA	NA	No weeds or algae visible. Water level has increased slightly.
Rimrock	5/28/08	21.2	8.73	7.3	0	0.15	0.2	8/NA	2.5 (bot)	50	N	NA	NA	Bladderwort was starting growing on the bottom.
Rimrock	6/23/08	25.9	7.76	7.8	2	0.09	0.33	12/20	1.7	50	N	NA	NA	Bladderwort is ready to treat on next visit.
Rimrock	6/25/08	NA	8.02	NA	NA	NA	NA	NA	NA	NA	Y	Cutrine Reward	3 gal each	Treated the bladderwort.
Rimrock	7/30/08	30.4	8.15	7.1	0	0.03	1.02	NA	1.4	50	N	NA	NA	Small areas of bladderwort floating on surface.
Rimrock	9/2/08	26.1	6.98	7.7	0	0.08	>3.00	16/20	1.7	50	N	NA	NA	No algae or weeds visible. 12 geese observed.
Rimrock	9/30/08	NA												
Ledgeway	5/28/08	21.7	7.95	7.2	4	0.0	1.05	12/NA	1.4	100	N	NA	NA	Water lilies were starting to surface.
Ledgeway	6/23/08	25.8	6.76	7.5	10	0.2	0.29	8/28	1.5	100	N	NA	NA	Water lilies surfacing and bladderwort starting to show on bottom.
Ledgeway	7/28/08	NA	NA	NA	NA	NA	NA	NA	NA	NA	Y	AquaPro	1	Treated water lilies
Ledgeway	7/30/08	31	7.73	7.7	13	0.17	0.08	NA	1.1	90	N	NA	NA	Lilies starting to brown out from treatment.
Ledgeway	9/2/08	26.4	7.43	7.5	4	0.04	1.94	12/20	1.3	80	N	NA	NA	Bladderwort to the surface where lilies have died.
Ledgeway	9/30/08	NA	NA	7.1	0	0.25	0.52	16/32	1.5	60	N	NA	NA	Bladderwort appears to be subsiding.
Little Bell	5/28/08	18.8	10.06	7.3	0	0.16	0.25	12/NA	2	190	N	NA	NA	No weeds or algae visible
Little Bell	6/23/08	24.7	8.36	7.5	12	0.09	0.68	12/36	1.9	190	N	NA	NA	No algae was visible and some water star grass was observed along northern shoreline.
Little Bell	7/30/08	30.5	9.54	7.6	NA	NA	NA	NA	1.5	160	N	NA	NA	Lost our sample. Some Naiad was beginning to grow in back quarter.
Little Bell	9/2/08	25.6	8.44	7.6	9	0.11	2.27	20/28	1.6 (bot)	170	N	NA	NA	Naiad and algae growing on bottom 2-3 feet from surface.
Little Bell	9/30/08	17.4	NA	7.2	0	0.27	1.1	16/36	1.9	110	N	NA	NA	Naiad and algae growing on bottom 2-3 feet from surface.
Bluestone	5/28/08	20.2	9.45	7.3	7	0.11	1.75	12/NA	2.7 (bot)	170	Y	Cutrine Reward	1 gal each	Water star grass and algae were heavy around boat launch.

Bluestone	6/23/08	25.0	8.51	7.6	0	0.06	1.41	20/32	1.57	160	N	NA	NA	Water star grass and algae have cleared up from last month's treatment.
Bluestone	7/30/08	30.7	14.28	7.6	0	0.26	2.04	NA	no access	150	N	NA	NA	Heavy filamentous algae and naiad in boat launch area.
Bluestone	8/4/08	NA	NA	NA	NA	NA	NA	NA	NA	NA	Y	Cutrine Reward AquaPro	3 gal Reward 3 gal Cutrine 0.25AquaPro	Treated 1/3 of lake in front of boat launch and spot treated lilies.
Bluestone	9/2/08	26.0	6.23	7.5	7	0.07	0.04	20/24	2.5	150	N	NA	NA	Brown mats of dead plant material on the surface.
Bluestone	9/30/08	18.0	NA	7.1	0	0.19	0.81	16/32	2.5	100	N	NA	NA	Dead plant material is gone. Water lilies still visible. Treatment not effective due to plant's immaturity.
Mirror	5/28/08	17.7	8.23	7.4	0	0.09	0.87	12/NA	1.5(bot)	160	N	NA	NA	No weeds or algae visible
Mirror	6/23/08	23.4	7.42	7.6	11	0.07	0.54	20/32	1.25	160	N	NA	NA	Algae mats starting to form. Will treat on next visit.
Mirror	6/25/08	NA	8.05	NA	NA	NA	NA	NA	NA	NA	Y	Cutrine	0.75	Algae treatment was done for filamentous algae mats.
Mirror	7/30/08	28.5	10.09	7.5	4	0.24	0.76	NA	bottom	130	N	NA	NA	Small area of filamentous algae on surface.
Mirror	9/2/08	22.6	5.71	8.3	0	0.18	1.02	20/28	bottom	150	N	NA	NA	Small area of filamentous algae on surface. No Flow.
Mirror	9/30/08	16	NA	7.1	0	0.11	2.32	20/32	bottom	100	N	NA	NA	No algae visible on the surface.
Willow	5/20/08	11.4	11.14	7.3	N/A	N/A	N/A	N/A	bottom	N/A	Y	Cutrine	3.5	Algae was growing from the bottom and water star grass was visible.
Willow	5/28/08	18.7	8.71	7.2	3	0.05	0.52	12/NA	0.6 (bot)	160	N	NA	NA	Algae has dissipated due to last week's treatment. Spatterdock beginning to grow.
Willow	6/23/08	23.8	6.64	7.6	9	0.07	0.17	20/36	bottom	170	N	NA	NA	Bladderwort, Naiad, and algae heavy in areas. Will treat on next visit.
Willow	6/25/08	NA	7.89	NA	NA	NA	NA	NA	NA	NA	Y	Cutrine Reward	1.25 Reward 2.5 Cutrine	Treated the bladderwort, Naiad, and algae.
Willow	7/30/08	28.8	9.93	7.6	0	0.16	1.08	NA	bottom	130	N	NA	NA	Very small area of filamentous algae near inlet.
Willow	9/2/08	23.3	5.9	7.6	3	0.04	2.67	20/36	bottom	170	N	NA	NA	Iron bacteria on surface. Small areas of algae. No Flow.
Willow	9/30/08	16.1	NA	7	0	0.22	0.49	20/36	bottom	100	N	NA	NA	Iron bacteria gone. Algae growing on bottom (2-3 ft) from

														surfacing.
McConnell	5/28/08	19	9.47	7.6	2	0.12	0.29	8/NA	2.5	120	N	NA	NA	Good water clarity. Shoreline emergents starting to grow.
McConnell	6/23/08	26.5	8.38	7.1	4	0.17	0.02	24/36	2	120	N	NA	NA	Nuisance weeds from last year have not emerged yet.
McConnell	7/28/08	NA	NA	NA	NA	NA	NA	NA	NA	NA	Y	Cutrine Reward AquaPro	10 Reward 5 Cutrine 0.5 AquaPro	Treated unidentified weed in same areas as in 2007. Treated docks that were enclosed with lilies.
McConnell	7/30/08	28.7	7.95	6.9	0	0.12	2.21	NA	1.4	120	Y	Cutrine Reward	7.5 gal each	Finished treating unidentified weeds from previous visit.
McConnell	9/2/08	26.5	7.72	6.8	0	0.02	1.74	16/32	1.5	110	N	NA	NA	Unidentified weed is gone.
McConnell	9/30/08	NA	NA	7.5	8	0.05	0.49	16/32	1.7	100	N	NA	NA	No algae or weeds visible.

Table1. Summary of the water chemistry results and treatment details observed in 2008 at the Hemlock Farms Community Association.