FINAL REPORT
WIRB Matching Grant

Project # 6034-016

Lake Colchester/Middle Creek

Lakewood Village Association &

Lakewood Benefited Recreational Lake District

Financial Accountability

WIRB FUNDS

Budget Line Item	Total Funds Approved	Total Funds Expended	Available Funds ($)
Equipment	$189,000.00	$189,045.93	($45.93)
Salary/Benefits	$51,000.00	$49,450.18	$1,549.82
Contractual-Administrative	$7,500.00	$6,418.63	$1,081.37
Totals	$247,500.00	$244,914.74	$2,585.26
Difference			$2,585.26

TOTAL PROJECT FUNDING

FUNDING SOURCE	Approved Application Budget/Cash	Actual ($) CASH	Approved Application Budget-In Kind	Actual ($) IN-KIND	Approved Application Budget TOTAL	Actual ($) TOTAL
WIRB	$247,500.00	$244,914.74	0	0	$247,500.00	$244,914.74
LBRLD (matching)	$255,000.00	$264,324.92	0	0	$255,000.00	$264,324.92
Association (LVA)	0	0	0	$12,175.00	0	$ 12,175.00
Association (LVA)	0	0	0	$9,000.00	0	$ 9,000.00
Total	$502,500.00	$509,239.66	0	$21,175.00	$502,500.00	**$530,414.66**

Practices & Activities Summary

Practice or Activity	Unit	Approved Application Goal	Accomplishments	Percent Completion
Equipment	No.			
Lake Circulators		4	4	100%
Nets, Traps, Feeders		4, 4, & 2	4, 4, & 2	100%
Boat & Motor		1	1	100%
Inlet Sediment Control (Silt Removal)	CY/ or $195, 000	11,000	7,474 $203,232.52	~67% (Goal/Silt) 104% (of Line Budget)
Rough Fish Removals	Pounds	10,000	11,245	110%
Predatory Fish Stocking	No.	4,000	4,782	119%
Aquatic Plantings	No.	1,000	800	80%
Seeds/Plugs		3,000	300	.10%
Aquatic Nursery		1	2	200%
In-Lake Fish Structure	No.	90-100	90	99%
Public Education/Seminars	No.	4	4	100%
Workshops/Meetings		32	50	100%

Water Quality Measurements

Location	Conditions	9/2007	8/2008	8/2009	6/2010
Site #1 Spillway/East End	Secchi – m PH - DO – Color -	.31 9 6 Algal Bloom	1.17 7.95 7.62 Brown	1.33 7.73 6.30 Lt. Brown	1.00 8.32 6.91 Green
Site #2 Silt Dam Drainage Mid-Body	Secchi - m PH – DO – Color	.31 9 8 Algal Bloom	1.00 7.80 5.65 Brown	1.33 7.87 6.57 Lt. Brown	1.00 8.24 6.30 Green
Site #3 Main Body	Secchi - m PH – DO – Color	.28 8 9 Algal Bloom	.83 7.64 3.06 Brown	1.33 7.96 7.13 Lt. Brown	1.00 7.81 1.50 Green
Site #4 Beardsley Inlet	Secchi –m PH DO Color	.15 8 8 Brown	.83 7.68 4.64 Brown	1.00 8.01 8.20 Lt. Brown	1.00 8.13 5.85 Green

Water Quality Improvements

- Beginning average Secchi depth (University of Iowa) 0.28-0.38 with a rating of Iowa Lakes as “Poor” and obvious surface scum, blue-green algal blooms and odor.
- Ending average Secchi depth: 1.00 m + Lt Brown/Green color; no algal blooms, scum or odor.
- Goal: Implement Water Quality Testing to monitor overall bio-manipulation of nutrients, the oxygenation of water to stimulate biological processes that reduce turbidity and kill unwanted bacteria.
- Activities: Two Volunteer members trained at DNR-sponsored program, IOWATER, and utilized free test kits to sample the water. Results were posted on the IOWATER website. Additionally, lab results of samples were obtained from Hygienic Labs of UI. Additionally, professional sampling and lab evaluation was completed quarterly at four sites. (See Measurement Chart)
- This project suffered a very major setback about mid-point with the Floods of 2008. About 180,000 CY of additional silt was deposited into the mid-section and throat of the lake. The West End and Beardsley Bay inlets had very significant additional silt loads from the Middle Creek Watershed which created ‘inches only’ depth. At this point, the scope of the project changed dramatically. Updated silt analyses were completed.
- Water quality was significantly changed from poor to very poor conditions. Boats could not navigate inlets.
- Large quantities of debris were also deposited into the lake; and had to be removed. Volunteers spent days and weeks removing boats, docks, tires, timbers, chemical drums, and other construction site debris from the lake.
- Upstream rubble dams failed in the watershed.
- Testing has provided a quantifiable method for monitoring BMP efforts; and is very helpful in monitoring conditions. Water Quality Testing is essential for benchmarking and measuring results.

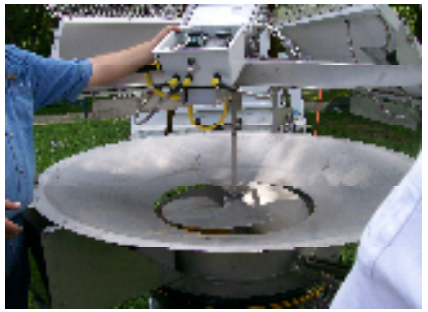
Lake Colchester Views BEFORE WIRB Project

Lake Colchester Views AFTER BMP’s

Lake Circulation Equipment

- Water bodies require good circulation to function properly. Quiescent or stagnant water bodies are subject to water quality problems such as harmful algae blooms (HABs). HABs frequently occur in recreational waters such as Lake Colchester that have high nutrient loads and low water flow rates.
- Cyanotoxins can cause chronic illness, harm most aquatic life and threaten the sustainability of aquatic ecosystem. HAB die-offs settle in the lake sediment, depleting oxygen in the water, can cause fish kills and create odors.
- Lake Colchester experienced water quality problems, blue-green algae blooms, odor compounds and other potential endangerments to people, habitat, lake wildlife, vegetation and recreation.
- To solve fresh water quality problems, lake circulation equipment was purchased to create radial, long-distance circulation of the water column. This circulation disrupts stagnant water and habitat necessary for algae growth. Four (4) SolarBees were strategically placed in Lake Colchester.
- No blue-green or other algae growth have occurred since installation. Improved aesthetic appeal in improved water clarity and quality; improved recreational abilities such as swimming, fishing, boating; improved aquatic vegetation quantity and quality, and additional species and quantity of habitat are documented.
- Recreational use (fishing, swimming, boating) of the lake has increased by ~40%. (Based on boat registrations and other rentals, fishing reports and professional studies. See Farmer's National Reports of 2006, 2008 & 2010.)
- Cost for 4 circulators: $184,000.00
- Equipment is very reliable; very little maintenance is required. Operation is solar-powered; therefore offers no-cost operations.
- Equipment provides excellent results for improved water quality (see reports and measurements.)
- Maintenance contracts are pricy. High cost initial investment.
- Maximum effectiveness for little, if any, negative environmental impact. Totally solar powered; non-invasive; no chemicals or other harmful impacts on environment.
- The four lake circulators are a major factor for accomplishing improved water quality and its benefits for Lake Colchester. It is anticipated that maximum benefits for improved water quality will be realized once the large volumes of silt are removed by hydraulic dredging in the near future. Circulator #4 will be relocated into the West End Inlet for maximum affect after silt removals are completed.

Lake Circulators Assembly



Lake Circulators Final Inspection

Lake Circulator Operational

Construction – Silt Removals

- Finger Pond - ~1,300 CY silt was removed in February, 2009 at a cost of $36,000. Significant contributions (in addition to matching funder) were made in the amount $10,000 by the LVA in order to accomplish additional silt removals from the Finger Pond inlet.
- Prior to excavation and removal of silt, a maximum of 3-6" depth of dark brown water existed. After excavation, this area is 4-5' depth. Since this is a major inlet to Lake Colchester, the excavation creates mitigation site for future silt deposits which can more easily be accessed and removed.
- West End/North Shore Inlet ~6,174 CY silt was excavated in April/May 2010 Cost: $168,000 – along 2,000 feet of shoreline – increased from 3-6" depth to 5 ft depth.
- Creation of a 20 yard bank slope was created after construction (excavation) for a future aquatic plantings site.
- Site restoration included natural re-seeding of 10 acres along the shoreline area; and shoreline was re-stabilized.
- This project facilitated preparation for a near-future ~ 26 acre, in-lake mitigation site near the Beardsley Bay Inlet which will retain deposits and prohibit silt deposits from traveling throughout body of lake.
- Budget estimates fell short of actual costs of excavation construction. In the Finger Pond excavation, the difficult location (within a neighborhood setting) presented access and egress challenges and liabilities for heavy construction equipment. As well, spoil site distance was costly. Contractors recommended a winter project to freeze the silt (after draining the pond.) Attempts to drain the pond were ineffective due to upstream run-off.
- The West End (North Shore) project also required a haul road to be constructed in order to access the DNR-permitted spoil site. This, along with required site restoration and engineering costs for the project, represented an unforeseen, significant portion of the cost of the project.
- Optimal project timeframe would be in very dry seasons or conditions. Attempts at partial lake drawdown via pumping and release valve were ineffective due to unusually rainy and flooding conditions that existed throughout the entire project timeframe.
- Near future hydraulic dredging will be necessary to effectively remove the large quantities of silt that were deposited in catastrophic events that occurred during the course of the WIRB project. Excavation had little affect on the total silt amounts; yet was the most significant cost factor. The areas excavated, however, are significantly improved, along with mitigation, navigation and water quality improvements.

Finger Pond Excavation – February, 2009 @ ~1,300 CY

West End/North Shore Excavation – April/May, 2010 @ ~6,174 CY

Aquatic Vegetation

Lake Colchester was almost void of aquatic vegetation prior to the WIRB Grant Project. Shoreline consists of rip-rap. The introduction of aquatic vegetation will provide fish habitat, filter pollutants, increase of oxygen levels in the water, and provide refuge for zooplankton.

Following are the steps taken:

- Research, education, site visits, personnel training seminars on best suitable aquatic vegetation and methods for Lake Colchester & Middle Creek watershed and shoreline. Expert Sources: Iowa DNR – Darcy Cashett and Missouri DNR – James R. Whitely & Becky Erickson.
- Soil and site preparation of shoreline and watershed areas for aquatic plantings and aquatic nursery was necessary. Areas were established by removing existing rip-rap to expose sufficient soil for planting. Clearing of debris and unwanted undergrowth, sloping and grade stabilization were required in other areas.
- Custom exclosures were constructed from ½" hardware cloth per site. Project signage was placed on exclosures. Top and bottom closures are required.
- Four highly recommend and tested aquatic vegetation species were selected. They include Arrowhead, Sweet flag, Pickerel Weed, and Cattail.
- Planted over 800 of plants in 20 locations. Maintenance of exclosures, separation/ harvest of plants/ seed pods for transplanting, and general maintenance of the nursery starts and thriving plants is required after initial planting.
- 50-100 plants (cattail & arrowhead) have been separated and transplanted from nursery or thriving areas to additional areas.
- Well-established plants survived the winter; and once established, the plants thrive and proliferate. In the second year of the project, numerous seed pods and seeds are now available for harvest. They will provide plant starts for the upcoming year (2011.)
- Lessons learned: Smaller gauge wire (½" hardware cloth) for exclosures is preferred. Lake wildlife such as raccoon, muskrat, beavers are huge threat. Exclosures must be animal-proof. (Welded wire will not stop muskrats.) Also severe weather conditions such as flooding and harsh winter conditions caused numerous losses. Rip-rap shorelines provide very little soil for planting. Exclosures had to be planted well into the lake in order to provide for sufficient soil. This was labor-intensive.
- There is 100% increase in cattails and arrowhead in the inlet areas of the lake that has occurred naturally. This is a phenomenon may be attributed to improved water quality and natural transplants from the flooding. Harvests for additional transplants are being made from these areas.

Site & Soil Preparation

Selection & Purchase of Species

Custom Exclosure Construction

Exclosure Project Sites
North Shore & West End

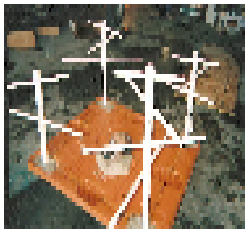
Aquatic Nursery Areas
5 Acre Park & Finger Pond

Artificial & Natural Fish Habitat

- Lake Colchester had little deep water fish habitat outside shorelines 170 acre facility.
- Goal: Provide habitat structures, both natural and artificial, as a shelter for game fish. Structures are a resource necessary for game fish quality, health and survival. Provide ambush points for game fish to feed on undesired species. Structures are vital in Lake Colchester's ability to produce and sustain a healthy population and balance of game fish to rough fish.
- Over 90 custom built structures and/or natural structures were placed in Lake Colchester over the course of the three-year project to create
- Natural structures included cutting and placing 12 trees along the north shoreline and in various coves. A 17 ton river rock structure was placed off a popular shoreline and boat fishing location – Gazebo Point.
- 16 custom structures constructed of of pvc pipe poles, natural brush and rocks/stones were placed in the deeper water along the dam.
- 21 pvc 'catfish condo' style structures were placed in various locations within the lake.
- 52 additional structures were placed randomly in the lake.
- All structures were identified with GPS locations and annotated on the Lake Colchester Fishing Maps.
- Caution was used to locate the size and shape of structure to appropriate water depth.
- Structures encourage zooplankton grown, therefore, spawning sites for predatory game fish.
- Significant savings were realized by designing and constructing structures in-house. Cost comparisons were made through catalogs and local sports markets. Average cost, including labor and materials per structure was $11-30 each compared to purchased costs of $40-$75 each. The rock reef was costliest structure at ~ $500. Common materials used: PVC pipe, concrete mix, pallets, tie wires, 5 gallon buckets, trees, wood brush, stones/rocks.
- Early winter months (when other project activities were halted) were found to be ideal for custom construction of structures. Structures were placed on lake in identified locations just prior to early spring thaws (March) for easy placement .

12 Trees Cut @ N Shoreline

River Rock Structure @ Gazebo Pt



Miscellaneous Styles-PVC/Artificial Structures

Placement of Structures

Rough Fish Removal & Disposal

- Project Goal: Remove 10,000 pounds rough fish. To drastically reduce numbers of rough fish to increase water quality, reduce turbidity, allow for aquatic vegetation and reduce stress on game fish. Rough fish compete for game fish spawning areas and space making it difficult for them to forage.
- Removed 11,112 total pounds: 5,190 lbs. Catfish; 4,437 lbs. carp, and 1,485 lbs. shad.
- Variety of Methods Used: Feeders, Nets, Traps, bow/arrow; traditional rod & reels, shocking. Bow and arrow, cast netting and shocking were most effective methods of removal.
- Utilized professional fishing clubs, total of 12 fishing tournaments, volunteers, and paid staff to remove fish.
- Experimented with various types of fish food for feeders. Game food fish was most effective.
- .Problems encountered: Feeders were moderate to high maintenance. Ducks, raccoon and other wildlife were attracted to the feeders. Seining was attempted; but not successful with current equipment.
- Would recommend utilizing additional professional fishing groups or shocking to remove greater quantities; additional traps and labor during carp spawning to remove maximum harvest.
- Nets and traps were difficult and very labor intensive. Traps were less effective as water quality improved. High cost of labor for per pound yield. Bow & arrow and shocking were most effective method. Unexpected benefit: Very large quantities of shad were attracted to lake circulators which facilitated easy removal of shad.
- Result: 2010 Comprehensive Lake Management Study (Farmer's National Company) "shows less carp and gizzard shad in the lake; although still prominent." "Hundreds of channel catfish were observed and sampled. There is still an overabundance of catfish."

2007-2008	2,157 lbs.	979 lbs.	423 lbs	
2009	2,033 lbs	2,530 lbs	566 lbs.	
2010	1,000 lbs.	928 lbs.	496 lbs	
Totals	5,190 lbs. **Catfish**	4,437 lbs. **Carp**	1,485 lbs **Shad**	**11,112 lbs.**

Fish Shocking/Removal

Trapping, Netting & Bow/Arrow Removals

Volunteers & Tournaments

Predatory Fish Stocking

Objective: Stock large, predatory fish species to create outstanding fishing experiences for residents. Use large predatory fish to eat Gizzard Shad and indirectly improve water clarity by reducing algae; then, place observable sand and gravel areas for game fish nests and spawning. Studies (by Natural Habitats) were completed in 2006 and 2008 which evaluated the fish populations and made recommendations for species as follows: Bi-annual game fish stocking of bass, walleye, and northern. Quantities by species per acre were recommended. Also, implementation of fishing regulations for size and/or "Catch and Release" regulations during the grant project for maximum results.

- "Catch & Release" regulations were implemented and enforced.
- Ideal time for stocking is typically later in the year. Survival is greatly improved by investing in larger fish. Fishing reports, winter severity, and other conditions were utilized to determine species, size and quantities to order..
- Professional Fish Studies were completed in 2008 and 2010 to monitor the project and to study the fish populations for quantity, quality and size; to make recommendations for stocking and harvest, various improvements, protection; and, to create fishing forecasts and projections for members. *These studies provide a very important tool for lake management efforts.*
- 2010 Comprehensive Lake Management Report completed by Farmer's National Company charted significant improvements:

"The walleye populations has increased significantly over the past 5 years. The size structure of the largemouth bass is very impressive for a mid-sized impoundment. If recommendations are followed, the lake will continue as a quality fishery, and should improve."

Delivery and Stocking of Predatory Fish Species

	Walleye	Bass	Northern
2008	1,500 @ 5" 680 @ 6-7" 160 @ 10-28"	500 @ 6" 520 @ 7" 9 @ 10-18"	213 @ 7-8"
2010	400 @ 5"	700 @ 5-6"	100 @ 7-8"
Totals	**2,740**	**1,729**	**313**

Watershed & Shorelines

- Lake Colchester shorelines consist of ~92% private property. It consists primarily of large rip-rap and gabion material with little aquatic vegetation. There are a number of areas with mild to considerable erosion or bank sloughing.
- One major flood event occurred during the first 12 months of the project; and a second flood event occurred during the last three months of the project. These floods represented major setbacks to the watershed, wetland areas and to the project. In the Flood of 2008, upstream construction sites created significant deposits of silt and major debris deposits; and the second flood event destroyed or severely damaged several rubble dams upstream as well and deposited significant debris and silt deposits.
- In addition to paid staff efforts, volunteers worked more than 2,500 hours during the three year project to clean-up watershed areas, prepare shoreline areas for aquatic plantings, remove large debris from the lake and inlet areas (see photo.) from the damage. Volunteers also conducted silt analysis and water quality measurements, provide GPS locations, mapping, and many other project-related activities in order maximize the overall success of the project. Additionally, Watershed Committee members met bi-weekly during the project to make vital decisions and monitor all aspects of the project.
- Severely eroded and soughed areas of shoreline were graded and restored with aquatic vegetation where possible. Restoration/re-seeding of construction sites (excavation of silt) was required in contracts.
- Aquatic plantings experts such as Darcy Cashett (IDNR) and Becky Erickson (Missouri DNR) were consulted for best shoreline protection. A seminar was conducted for watershed committee members by Ms. Cashett. An additional seminar was conducted for residents during an annual neighborhood gathering to educate members on a variety of watershed protection and enhancements along the lakeshore. Thirty-five homeowners attended.
- Educational materials on watershed and shoreline protection were distributed bi-annually to 614 homeowners during the project via newsletters, brochures, mini-seminars and website.
- Educational materials were made available to 614 residents regarding various species of aquatic plantings determined to be best suited for the area.

Volunteers' Clean-up 5 Acre Park Watershed Area

Finger Pond Inlet Clean-up

Shoreline Restorations
West End & Beardsley Inlets

Project Background

In August 2006 the LVA approved and submitted a grant request to the Watershed Improvement Review Board (WIRB) for assistance with an In-Lake Management plan. The WIRB approved the grant for the amount of $247,500.00. The WIRB requires matching funds allotted to the project for a minimum of the grant approval amount. The LBRLD has agreed to match and exceed these funds with a total contribution of $400,000.00.

The goals of in-lake management using a biomanipulation approach are to achieve the proper balance of predatory fish, zooplankton grazing of algae, and native aquatic vegetation, ultimately resulting in improved water clarity and quality.

Rough Fish Removal

Previous studies have documented the negative impacts rough fish (i.e. Common Carp, Gizzard Shad, Bullhead, and small Channel Catfish) have on our lake. These fish are predominantly bottom feeders and continue to disrupt and re-suspend the soft soils that exist on Lake Colchester's bottom. In addition, it is impossible to establish in-lake aquatic vegetation with the over-abundance of Common Carp in the lake.

Fish will be removed through a series of netting, trapping, and partial fish kills. Large feeders will be used to attract the rough fish to a concentrated area. Traps will be deployed within the feeding vicinity. Seine and Trawl nets will be used as needed. Partial fish kills may be performed in the early spring in the Lake's three inlets.

Lakewood Village Association
Watershed Improvement Committee

Lakewood Benefited Recreational Lake District:

- **Duane Sand – Trustee**
- **Joe Zerfas – Trustee**
- **Jeff Halvorson – Trustee**

Lakewood Village Association:

- **Nate Sizemore – President**
- **Kent Risbeck – Secretary**
- **Lloyd Carlson – Treasurer**
- **Blaine Buenger – Director**
- **Chris Hochstein – Appointed Director**
- **Jeff Livingston – Appointed Director**
- **David Albright – Resident**
- **Rob Coffey – Member**

Technical Advisors:

- **Don Bonneau – Iowa DNR Fisheries**
- **Dr. John Downing – ISU Limnologist**
- **Nick Morrell – NRCS Conservationist**

Lakewood Village Association

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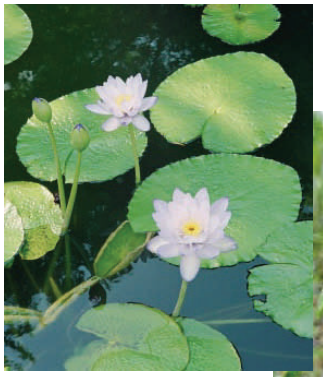
Lake Colchester

In-Lake Management Plan



Lakewood Village Association
www.mylakewoodonline.com

Aquatic Vegetation

Aquatic vegetation is non-existent in Lake Colchester. The introduction of aquatic vegetation will provide fish habitat, filter pollutants, increase oxygen levels in the water, and provide refuge for zooplankton.

The shallow end of Finger Pond (area shown in green) will be used as a nursery to establish aquatic vegetation that will be eventually transplanted to key areas of Lake Colchester.

Inlet Sediment Control Projects

Lake Colchester will need to be lowered approximately 3.5' in order to construct the inlet sediment control devices at Middle Creek Bay and Beardsley Bay. This will be performed over the winter months to allow the exposed silt to freeze. Conventional earthmoving equipment will then be used to excavate silt and clay to create substantial depth in these areas. Finger Pond will be excavated in the same manner. Spring rains and snowmelt will bring the lake back to normal pool.

Lake Circulators

Circulation of lake water prevents algae blooms, fish kills, and odors. Circulation also helps oxygenate water at lower depths, and provides uniform lake temperature. The Watershed Improvement Committee will work with technical advisors to review available technologies. The installation of Solarbees, a solar powered lake circulator, is one option the Committee is researching. The use of a lake circulator is required to maintain the fish population during lake drawdown periods.

LAKE COLCHESTER
FISHING MAP

In an effort to sustain Lake Colchester's game fish, the LVA continually monitors fish population and adjusts size and quantity limits accordingly. The following regulations are in effect from 1/2/10 to 12/31/10:

Largemouth Bass - 1 PER DAY, 15" MINIMUM LENGTH
Walleye - 1 PER DAY, 15" MINIMUM LENGTH
Northern Pike - 1 PER DAY, 30" MINIMUM LENGTH
Crappie - No size limit, 15 fish per day, per person

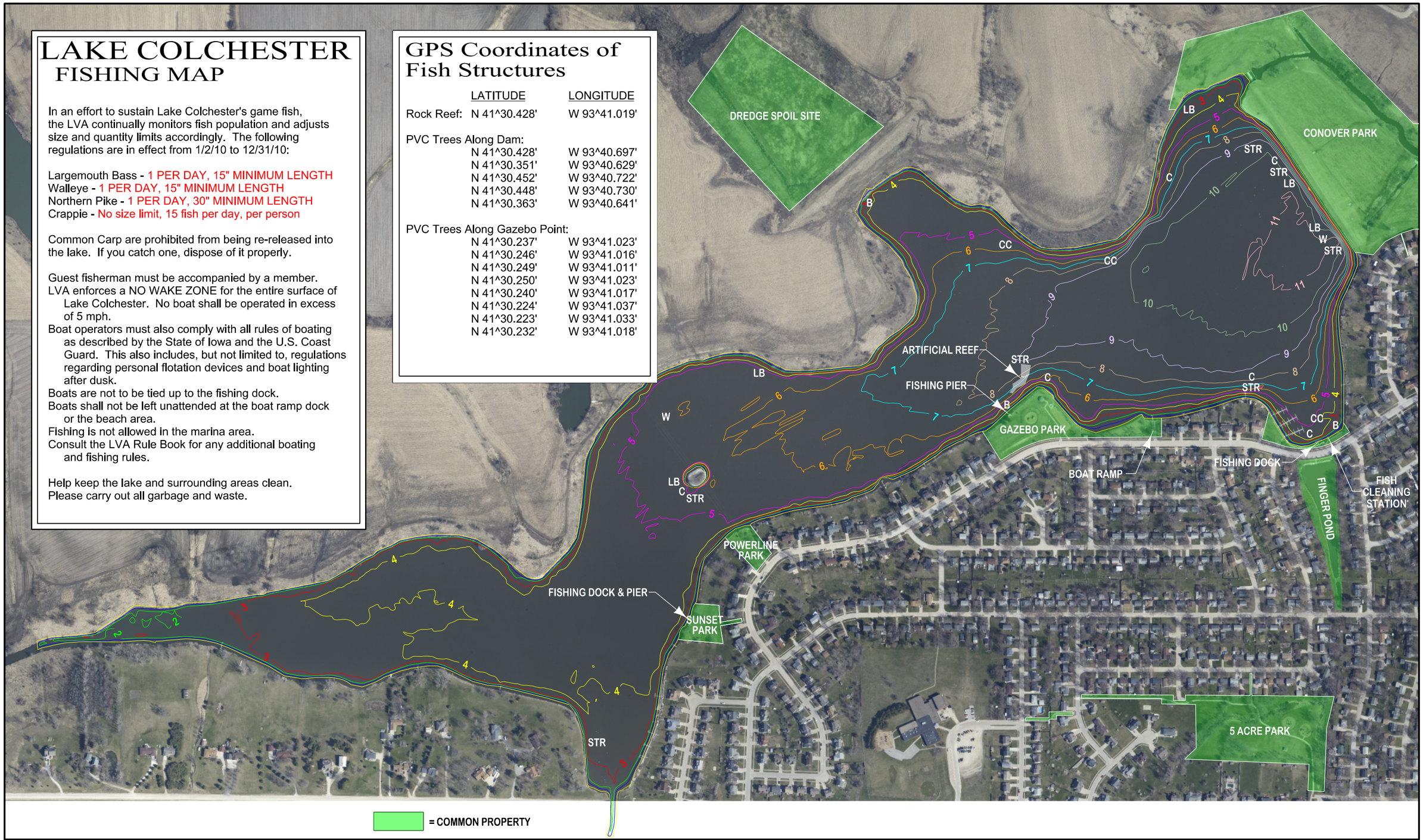
Common Carp are prohibited from being re-released into the lake. If you catch one, dispose of it properly.

Guest fisherman must be accompanied by a member.
LVA enforces a NO WAKE ZONE for the entire surface of Lake Colchester. No boat shall be operated in excess of 5 mph.
Boat operators must also comply with all rules of boating as described by the State of Iowa and the U.S. Coast Guard. This also includes, but not limited to, regulations regarding personal flotation devices and boat lighting after dusk.
Boats are not to be tied up to the fishing dock.
Boats shall not be left unattended at the boat ramp dock or the beach area.
Fishing is not allowed in the marina area.
Consult the LVA Rule Book for any additional boating and fishing rules.

Help keep the lake and surrounding areas clean.
Please carry out all garbage and waste.

GPS Coordinates of Fish Structures

	LATITUDE	LONGITUDE
Rock Reef:	N 41^30.428'	W 93^41.019'
PVC Trees Along Dam:		
	N 41^30.428'	W 93^40.697'
	N 41^30.351'	W 93^40.629'
	N 41^30.452'	W 93^40.722'
	N 41^30.448'	W 93^40.730'
	N 41^30.363'	W 93^40.641'
PVC Trees Along Gazebo Point:		
	N 41^30.237'	W 93^41.023'
	N 41^30.246'	W 93^41.016'
	N 41^30.249'	W 93^41.011'
	N 41^30.250'	W 93^41.023'
	N 41^30.240'	W 93^41.017'
	N 41^30.224'	W 93^41.037'
	N 41^30.223'	W 93^41.033'
	N 41^30.232'	W 93^41.018'



LEGEND:

B	C	W	LB	SB	CC	NP	Common Carp	STR
Bluegill	Crappie	Walleye	Largemouth Bass	Smallmouth Bass	Channel Catfish	Northern Pike		Fish Structure i.e. rock reefs, pvc trees & other artificial habitat.

- Map compiled by Lakewood Village Association Habitat Committee.
- Contours generated from soundings taken in December of 2009.
- Aerials from spring 2008 flight

Revision - March 19th, 2010

0 250 500 FEET

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Lakewood Village Association, Inc.