



CANDLEWOOD LAKE AUTHORITY

P.O. BOX 37 • SHERMAN, CONNECTICUT 06784-0037 • (860) 354-6928 • FAX (860) 350-5611

Minutes of Regular Meeting May 9, 2012

Attending:

H. Berger	Sherman
P. Schaer	Sherman
E. Hayes	Sherman
F. Cioffi	Brookfield
H. Mayer	New Milford
B. Kemble	New Fairfield
J. Hodge	New Fairfield
N. Gyle	New Fairfield
J. Murphy	Brookfield
C. Robinson	Danbury
W. Lohan	Brookfield

Absent:

M. Calandrino	Danbury
M. Toussaint	New Milford
C. Caridad	New Milford
E. Siergiej	Danbury

L. Marsicano, CLA Executive Director
M. Howarth, CLA Public Education Director
F. Frattini, CLA Administrative Coordinator
S. Ring, CLA Intern

Recorder: F. Frattini

Guests: M. Propper, Danbury
C. Bielert, CT Bass Federation Nation
J & S. Wodarski, New Milford

Prior to the General Business Meeting the delegates had attended a tour of the Rocky River Facility conducted by Rich Laudanet and Gary Smolen of FirstLight Power Resources. After the tour Mr. Laudanet gave a Power Point presentation on Rocky River economic challenges of the Facility and the Lake to the delegates at Mallory Town Hall in Sherman.

Howie Berger, Chairman, called the regular meeting of the Candlewood Lake Authority to order at 8:20 P.M. at Mallory Town Hall, Sherman, CT. He welcomed the guests.

RECEIVED FOR RECORD
DANBURY TOWN CLERK

2012 MAY 14 P 1:59

BY: *Mull*

Chairman's Report: Howie Berger, Chairman, reported that the items that would be taken up this evening are:

- First Light
- Dr. Kelly's Visit
 - Science at Night presentation
- Zebra Mussel Billboard
- WCSU
- Legislation on Phosphorus still in the works
- Signed MOA – no feedback from Town's Attorneys
- Met with the 5 Towns regarding a letter to FirstLight to notify CLA of all land use permits on Candlewood - letter going out soon.
- Sale of CL Merchandise
- Town Budgets
- Committees holding spending
- Clean Up May 19th
- Sponsorships Dragon Boat Race
- Village Fair Days
- Project CLEAR
- Committee Reports

Mr. Berger began with a report on Dr. Kelly's visit, including Dr. Kelly's meetings with stakeholders in Massachusetts and Connecticut, and his presentation at Science at Night at WCSU. Here Larry Marsicano showed the delegates the Power Point presentation that Dr. Kelly gave. Mr. Berger noted that CL&P Foundation and Harcourt Foundation grants covered the costs for Dr. Kelly's visit. These also covered the cost of the Zebra Mussel Billboard. Mr. Marsicano advised that Dr. Kelly has put in a pre-proposal to the Bureau of Reclamation and funding sources are being investigated for field trials to test his theory on the use of carbon dioxide to prevent zebra mussel veligers from spreading between inland waters. Mr. Berger noted that the net cost of Dr. Kelly's visit based on the grants was zero. Mr. Berger thanked Mr. Marsicano for finding funding and work to bring Dr. Kelly out.

Mr. Berger made a motion to approve the MOA with the DEP for 2012 to 2014 seconded by John Hodge. The motion was voted with all in favor. Motion carried.

Secretary's Report: In the absence of the Secretary, Mr. Berger, noted that there are no corrections to the minutes of the April 11, 2012 meeting. Harold Mayer moved to approve the minutes of the April 11, 2012 meeting as presented, seconded by Phyllis Schaer and voted with all in favor. Minutes have been accepted as written.

Vice Chairman's Report: In the absence of the Vice Chairman there was nothing to report.

Treasurer's Report: Phyllis Schaer, Treasurer reported that the CLA should end the year breaking even with the help of the committees adjusting their expenses. Mr.

Hodge noted that you give the best services you can provide with the dollars you have. Mr. Berger noted that the Finance Committee would be meeting to adjust the proposed budget to the level that the Towns will be funding. Items removed will be proportionately returned as money from other sources is received. Mrs. Schaer made a motion to allow Equipment and Facilities to overspend their bottom line by three thousand (\$3000.00) dollars with funds from other under-spent line items in the current CLA budget, seconded Jerry Murphy and voted with all in favor. Phyllis Schaer made a motion to approve the Monthly Report of Income and Expenses for the month ended April 30th, 2012, seconded by Mr. Hodge, and voted with all in favor. Motion carried and the Treasurer's Report of Income and Expenses for the month ended April 30th, 2012, has been accepted and filed for audit.

Public Education Director's Report: Mark Howarth's written report is attached to these minutes. Mr. Berger noted that the idea of selling merchandise with the CL logo had been proposed and Mr. Howarth began to show samples of tee shirts, sweatshirts, and a towel that will be for sale at local businesses as well as on the CLA website. He also asked the delegates if they would like to participate in New Milford's Village Fair Days this year on July 27-28. This would be a good venue for the CL merchandise.

Executive Director's Report: Written report is attached to these minutes. Mr. Marsicano noted that boats are still needed for the Clean Up. He has been working with a prospective Eagle Scout from TownRidgefield on his project which is to make nameplates for the plants at the Buffer Garden in Sherman – he showed the delegates one of the plates. Mr. Marsicano also introduced CLA Intern Shannon Ring and thanked her as well as Mr. Howarth and Mrs. Frattini for their efforts on the Lake Clean Up.

Committee Reports:

Watershed Management: Committee Chair, Harold Mayer noted that he had nothing to add.

Equipment/Facilities: In the absence of the Committee Chair there was nothing to report.

Public Safety: Ed Hayes noted that the committee and Chief of the Lake Patrol have approved five new lake patrol officers who are finishing up their training and will be ready to patrol soon. As the Chief thought they might be scheduled for Memorial Day weekend it is necessary that the CLA approve their hiring. Ed Hayes made a motion that the CLA approve the hiring of the following Ronald Barnard, Richard Dorsch, David Hartman, Joseph Kyek and John Olimpio to the Candlewood Lake Authority Marine Patrol, seconded by Mr. Hodge and voted with all in favor. It was noted that the three POST certified officers are Mr. Barnard, former Prospect PD officer, Mr. Dorsch, Retired State Police and Mr. Hartman presently a Wilton Police Officer and two non POST are Mr. Kyek – a dispatcher at the Brookfield PD and Mr. Olimpio of the Westchester Department of Correction. Mr. Berger asked if the Public Safety Committee would provide him with an estimate of the number of patrol hours for this season.

Mr. Hayes reported that the Patrol boat would be in the Sherman Memorial Day Parade if available.

Public Awareness In the absence of the Committee Chair there was nothing to report.

Any and All Business: Mr. Berger advised that the IT structure of the CLA is deteriorating and an IT Technology plan is needed.

Mrs. Schaer noted that there will be an Invasive Investigator refresher class – but the time and place has not been finalized.

Mr. Berger went over the items that were covered at the meeting, noting it was all done in just 5 minutes more than an hour.

With no further business to come before the Candlewood Lake Authority, Harold Mayer moved to adjourn, seconded by John Hodge. Meeting adjourned at 9:25 P. M.

Respectfully submitted,


Ed Siergiej Secretary
Frances Frattini, Administrative Coordinator

r/b/lm

These minutes are not considered official until they have been approved at the next regularly scheduled meeting of the Candlewood Lake Authority.



CANDLEWOOD LAKE AUTHORITY

P.O. BOX 37 • SHERMAN, CONNECTICUT 06784-0037 • (860) 354-6928 • FAX (860) 350-5611

Executive Director's Report

May 3, 2012

Larry Marsicano

The following report summarizes activities of April 2, 2012 to May 3, 2012.

INVASIVE SPECIES MANAGEMENT – ZEBRA MUSSELS

We were able to successfully apply for community foundation support from Connecticut Light & Power and the Ellen Knowles Harcourt Foundation for \$5,000 and \$2,500 dollars, respectively, in funding to bring Dr. Kevin Kelly from Boulder, CO to southern New England, and to offset costs associated with the Invasive Species billboard, and to print 3,000 more copies of our zebra mussel tri-fold brochure.

The CLA planned and coordinated meetings and site visits for Dr. Kevin Kelly of the Department of the Interior's Bureau of Reclamation during the week of April 23rd thru 27th. Sites visited included Laurel Lake and Laurel Brook in MA and East & West Twin Lakes and outlets in Salisbury, CT. Two separate stakeholder meetings were held with coordination of the MA meeting provided by Housatonic Valley Association. Agencies/organizations represented at the meetings are listed below. A public seminar was sponsored by and held at Western Connecticut State University on April 26th.

The stakeholder meetings were very productive and all attendees appeared supportive of research proposed by Dr. Kelly. Efforts are underway to 1) submit a pre-proposal to his agency, and 2) solicit support and partnerships from entities in southern New England.

Massachusetts Organizations

Housatonic Valley Association
Lakes and Ponds Association Western Massachusetts
Laurel Lake Preservation Association
Lee Conservation Commission
MA Department of Conservation and Recreation
MA Wildlife - Fisheries and Wildlife Division
Pontoonsic Lake Association

Connecticut Organizations

Candlewood Lake Authority
CLA's Zebra Mussel Task Force
CT DEEP Boating Division
CT DEEP Inland Fisheries Division
FirstLight Power Resources
Western Connecticut State University

Phyllis and I participated in a conference call on April 24th with the CT DEEP regarding additional funding for invasive species outreach materials. They are investigating additional outreach materials but many of the departments are under a spending freeze until the end of the fiscal year.

INVASIVE SPECIES MANAGEMENT – EURASIAN WATERMILFOIL

At the request of the First Selectman of New Fairfield, I reviewed the 77 page report by Dr. George Knoecklein entitled *EVALUATION OF THE EFFECTS OF WINTER WATER LEVEL DRAWDOWN ON THE ECOLOGY OF CANDLEWOOD LAKE, CT*. Comments on the report were prepared and submitted to First Selectman Hodge.

Our Operations personnel have been monitoring the lake for presence of surfacing or near-surfacing milfoil while conducting operations-related tasks. To date they have not observed milfoil suggesting that it still below the visible reaches of the water. We will continue to monitor in order to report back to EnviroScience in a timely fashion so they can plan their visit later in the season.

We have designed a preliminary study on milfoil coverage since 2007 for WCSU students taking Geographic Information Systems (GIS) this spring. See below.

WESTERN CONNECTICUT STATE UNIVERSITY

We continue to strengthen our relationship with WCSU. On April 12th we participated in our second “Coffee and Conversation” with WCSU President Schmotter, faculty and other leaders from the University, and members of the public with interest in Candlewood. These meetings are part of a fundraising campaign so WCSU will have resources to more actively participate in Lake-related issues and research needs.

On April 16th I met with Dr. Alex Standish of the Social Science Department. Dr. Standish teaches the GIS course at the University and was looking for some opportunity to use GIS for Candlewood. We designed a preliminary study on the milfoil using the annual milfoil mapping data collected since 2007. First, we obtained the annual weed mapping data from the CT Agricultural Experiment Station. Dr. Standish and his students will use the data to determine areas of the lake that do not seem to change in terms of milfoil coverage regardless of which drawdown is performed. They will also quantify in greater detail the coverage of milfoil based on density. On April 18th we provided transportation on the lake to Dr. Standish’s class on a vessel donated by Echo Bay. The lake and applications of GIS were discussed.

PROJECT CLEAR

Approximately 50 students from two school districts and 75 students from three school districts met on April 10th and 11th respectively. We provided the opening / introductory lecture on both dates and also co-taught the program for the Plankton Group which met on the 10th. The meetings were held at the CT DEEP’s Kellogg Center in Derby, CT and provided an excellent learning environment for the students learning about the research they will be doing in late June. Upcoming Project CLEAR dates where the CLA will be participating include May 16th with the high school students at the Kellogg Center and May 15th with junior high students at Squantz Pond. Summer research by the high school students, which we coordinate/facilitate to a large extent, will occur from June 25 – 29.

VAUGHN'S NECK

Last month we reported that we had written letters to the Governor, Attorney General, and Commissioner of the CT DEEP in support of their approval of the NU/NSTAR merger with incorporations of conservation measures including extending the MOA between NU/CL&P and the State on the NU real estate, including Vaughn's Neck, Green and Deer Islands, etc. As part of the conservation package, a land trust is to be created and 1,000 acres protected. In addition to applauding the efforts we encouraged the Governor, Attorney General, and Commissioner to use the momentum and continue to look for creative ways to get Vaughn's Neck permanently protected. Since sending those letters, we did receive responses from the Commissioner and the Attorney General.

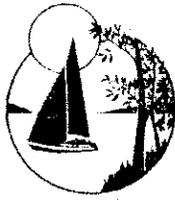
OTHER

We partnered with Candlewood Watershed Initiative and provided support for the successful Soil Testing Day held on Saturday, April 21st. Mr. Jim McAlister, Chair of the CWI, reported that 208 samples were received between the New Fairfield and Sherman drop off points for analyses of nutrient requirements.

We continue to plan for the Candlewood Lake Clean Up. Shannon, our Intern from WCSU, Frances, and Mark have done much of the planning! Frank Cioffi has reported a lower number of volunteers with vessels this year. PLEASE help by volunteering with your vessel or find others with vessels to volunteer.

Executive Committee met on May 2nd.

I lectured to a capstone science course for about 70 high school seniors at Canterbury School in New Milford on Friday, April 13th.



CANDLEWOOD LAKE AUTHORITY

P.O. BOX 37 • SHERMAN, CONNECTICUT 06784-0037 • (860) 354-6928 • FAX (860) 350-5611

May 9, 2012
Public Education
Mark Howarth

Sponsors:

In preparation for the Clean Up and Dragon Boat Race, we have been working to sell sponsorships to various area businesses. We sent over 100 sponsor kits out, and visited many more businesses in person. These sponsorships will provide critical funding to pay for the cost of the Clean Up and assist with Dragon Boat Race costs.

Clean Up:

Planning for the Clean Up is well under way. Designs for the new 2012 t-shirts are nearing completion. We are also working on finishing the design for the 2012 captain's hats. We will also be printing our sponsor banner.

We have a new Clean Up page on our website which has all of our sponsors shown and also has the 2011 Clean Up video. We have had a good turnout with our online registration and we will be sending out an email to let anyone who wishes to still participate know that we will be closing registration this week.

Online Donation System:

We have completed the registration and setup process for our new online donation service and they are setting up our account. They have told us that it only takes a few days for us to get up and running so we anticipate that any day now we will be able to offer that new feature on our website.

Candlewood Lake Products:

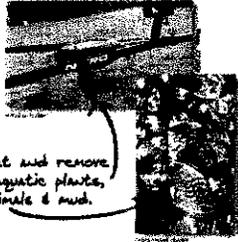
We have produced a number of Candlewood Lake clothing samples which we will then produce for sale on our website and at participating locations in the area.

Zebra Mussels:

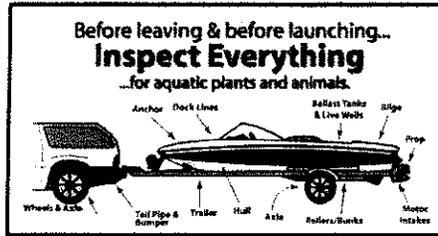
We received a request from Weatherford, TX to use and modify the files we created for our large zebra mussel boat ramp signs so that they can use them locally, which we gladly agreed to. We also received a request from Cynthia Stevens at Ball Pond to use and modify our zebra mussel tri-folds, for use at Ball Pond, which we also gladly agreed to. Files have been sent out for both of those requests. We also created a new zebra mussel banner, which was on display at the Science at Night zebra mussel seminar (shown below) which we will have for use at other events and locations as well.

Stop Aquatic Hitchhikers!

Clean Drain Dry
...all recreational equipment.



Inspect and remove
any aquatic plants,
animals & mud.



CANDLEWOOD

LAKE AUTHORITY
CandlewoodLakeAuthority.org



**STOP AQUATIC
HITCHHIKERS!**

Prevent the Spread of Invasive Species
Call 203-639-4444 for more information
www.candlewoodlakeauthority.org



**Connecticut
Light & Power**

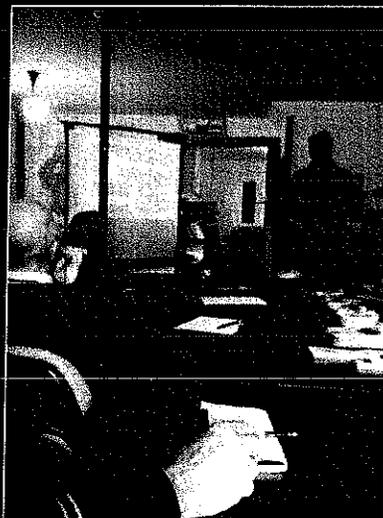
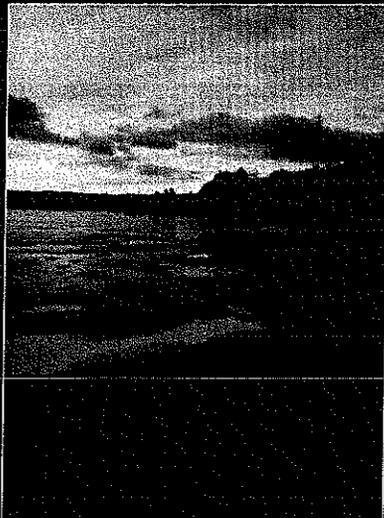
A Northeast Utilities Company



Ellen Knowles Harcourt Foundation



Dr. Kevin Kelly, Bureau of Reclamation
April 24th thru April 27th, 2012



RECLAMATION



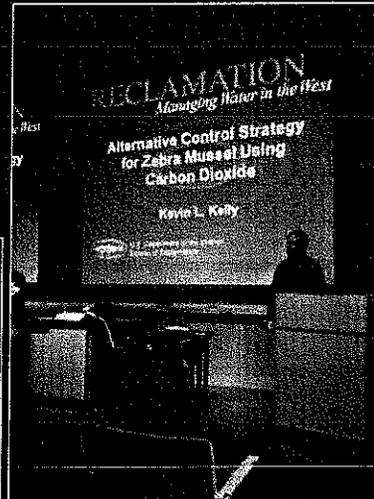
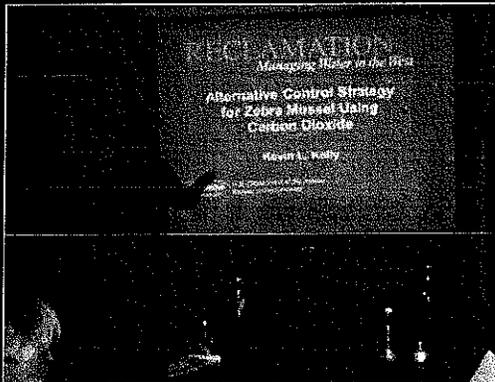
Wednesday, April 25th

- Housatonic Valley Association, South Lee, MA
- Laurel Lake and Laurel Brook

RECLAMATION

Thursday, April 26th

- Rocky River Station
- East & West Twin Lakes, Salisbury, CT
- Western Connecticut State University Researchers
- CT Stakeholders Meeting at WCSU
- "Science At Night" at WCSU



RECLAMATION

RECLAMATION

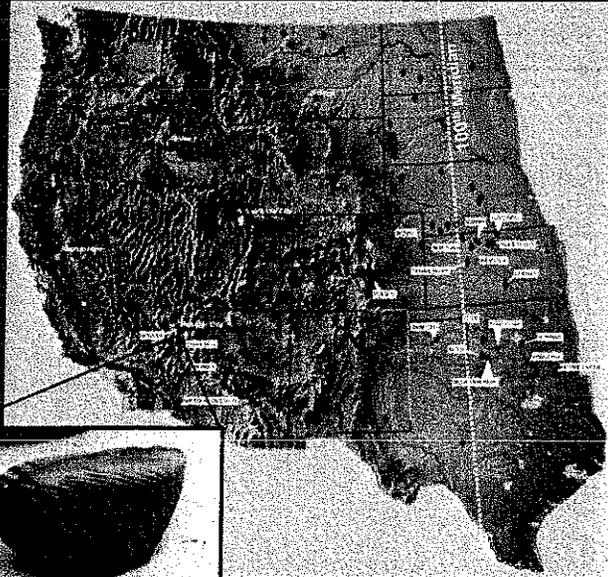
Managing Water in the West

Alternative Control Strategy for Zebra Mussel Using Carbon Dioxide

Kevin L. Kelly



U.S. Department of the Interior
Bureau of Reclamation



458 Dams

> 50,000 Miles
Canals

67
Hydroelectric
Power Plants

Quagga mussel, Lake Mead (Jan, 2007)

RECLAMATION

Storage Reservoirs (Hydroelectric Power)



RECLAMATION

Pumping Plants

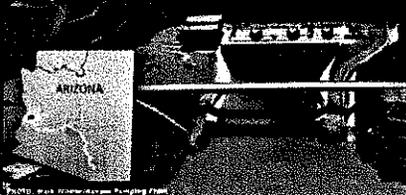
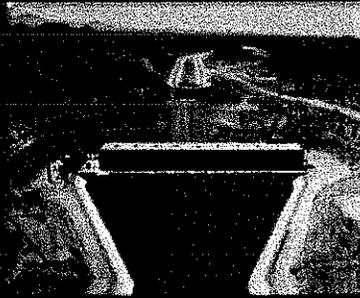
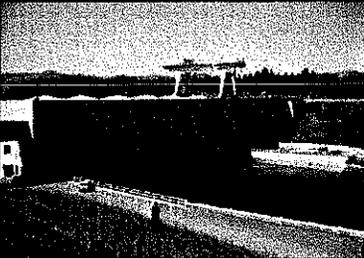


PHOTO: BOUSÉ HILLS PUMPING PLANT

Mark Wilmer/Havasus Pumping Plant



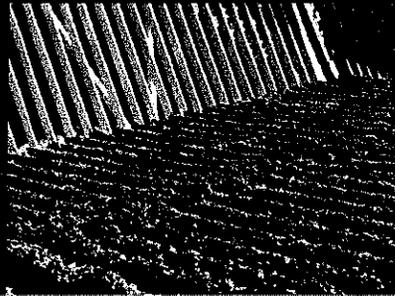
Bouse Hills Pumping Plant (CAP)



Tracy Pumping Plant (CA)

RECLAMATION

Flow Restriction



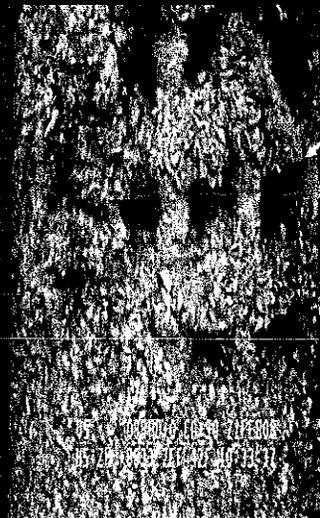
Fouled Trashrack, Corps of Engineers



Intake screen blocked by shells

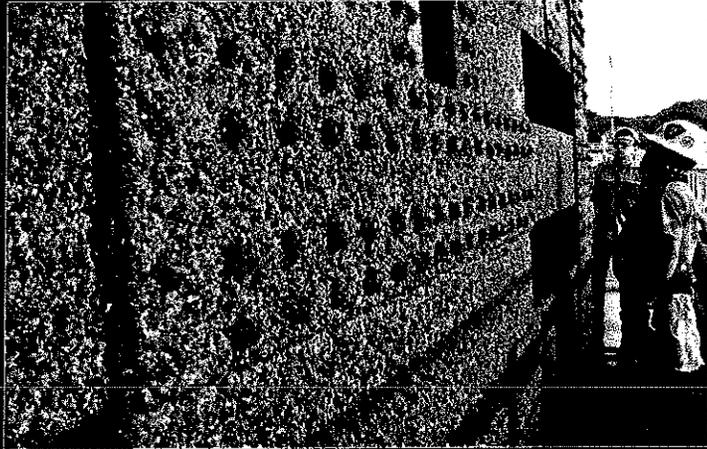
RECLAMATION

Domestic Water Intake – Parker Dam



RECLAMATION

Bulkhead Gate – Davis Dam

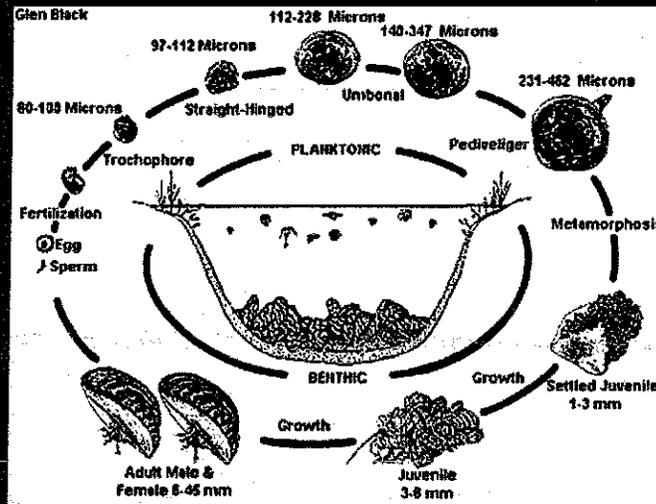


RECLAMATION

“An Ounce of Prevention is
Worth a Pound of Cure”

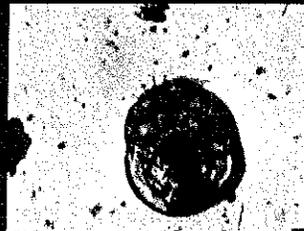
- Ben Franklin

RECLAMATION



www.fws.gov/Midwest/mussel/image_library_line_drawings.html

RECLAMATION



RECLAMATION

Previous Attempts to Treat Open Body of Water



1. Millbrook Quarry (Prince William County, VA)
 - Zebra mussels first reported August, 2002
 - 100 ppm potassium chloride
2. Zorinsky Lake (Omaha, NE)
 - Zebra mussel reported November, 2011
 - Desiccation over winter (drained lake)
3. Offutt Air Force Base (NE)
 - Zebra mussels
 - Copper Sulfate (1.0 ppm Cu)
 - Zebra mussels returned following year
 - Some non-target fish mortality
4. San Justo Reservoir (San Benito County, CA)
 - Zebra mussels first reported Jan, 2008
 - Draw down (later potassium chloride)
 - Tentative re-open in Fall, 2012 ??

RECLAMATION

General Theory Carbon Dioxide Treatment

According to previous studies, mussels are intolerant to even relatively modest increases in dissolved carbon dioxide concentrations, since they do not have oxygen-carrying proteins to buffer blood pH. Instead, they less efficiently mobilize shell carbonate as the main blood buffer.

Under ambient conditions, carbon dioxide is in equilibrium between the atmosphere and water. Temporary disruption of this equilibrium, by adding more carbon dioxide to the equilibrium, will temporarily cause a rise in aqueous carbon dioxide concentrations and impact zebra mussel survival.

RECLAMATION

Advantages of Using Carbon Dioxide

1. Very cheap \$0.10 - \$1.25/lb
2. Controllable and Reversible
3. Environmentally Ubiquitous
4. Easy to Obtain and Use
5. Multiple Modes of Action

RECLAMATION

Primary Modes of Action

1. Narcotic

Sub-lethal narcotizing effect using CO₂ begins only short (4 hrs) exposure periods as indicated by a gaping response.

2. pH Adjustment

Change pH of water via addition of CO₂, according to Henderson-Hasselbalch equilibrium.



3. Inhibition of Byssogenesis (for attached mussels)

RECLAMATION

Narcotic Effects and Adult Survivorship

Lethal LC₅₀ (Adults): 48 hrs @ 18°C = 196 ppm CO₂
 96 hrs @ 18°C = 74 ppm CO₂
 48 hrs @ 22°C = 290 ppm CO₂
 96 hrs @ 22°C = 81 ppm CO₂

Sub-lethal narcotizing effect induced after 4 hours as indicated by a gaping response

Continuous application of lower levels of CO₂ prevents or substantially reduces zebra mussel macrofouling (inhibits byssogenesis)

Sources:

- 1) Elzinga et al. Proceedings Fourth International Zebra Mussel Conference, Madison, WI.
- 2) McMahon et al., Proceedings Fifth Zebra Mussel and Other Aquatic Nuisance Organisms Conference, Ontario Hydro, Ontario, Canada.

RECLAMATION

Carbon Dioxide Solubility vs Temp & P_{CO2}

(Pure Water @ pH = 7)

Temp °C	0.033%	5%	10%	100%
	Normocapnia P _{CO2} = 2.51 torr	Hypercapnia P _{CO2} = 38 torr	Hypercapnia P _{CO2} = 76 torr	Saturation P _{CO2} = 760 torr
CO ₂ solubility in mg/L				
0	1.10	167.35	334.7	3,347
5	0.92	139.10	278.2	2,782
10	0.77	115.95	231.9	2,319
15	0.65	98.80	197.6	1,976
20	0.56	84.45	168.9	1,689
25	0.47	71.50	143.0	1,430
30	0.41	62.50	125.0	1,250
35	0.36	55.30	110.6	1,106

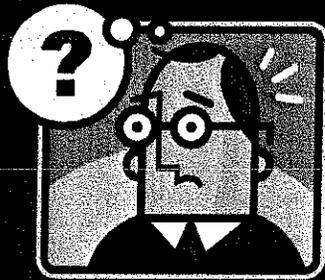
From McMahon et al., 1995

RECLAMATION

Knowledge Gap

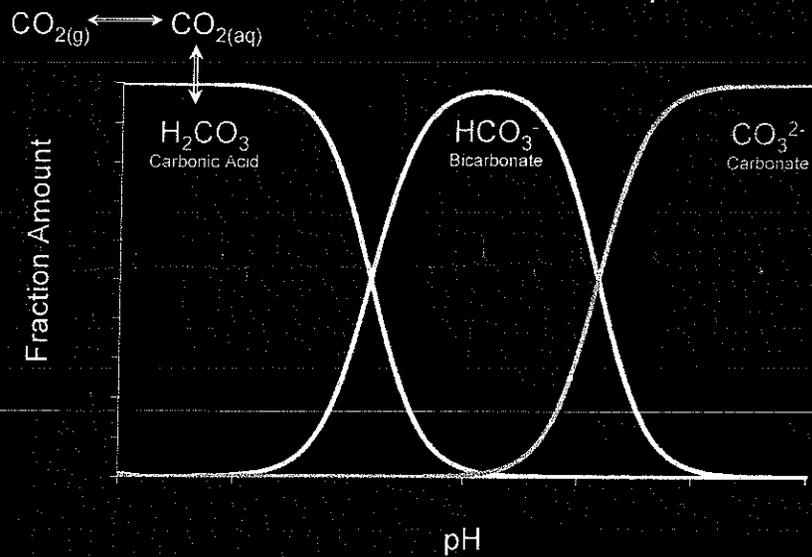
What effect does CO_2 has on the Zebra Mussel Planktonic Life Stage (Veligers)?

(We need a Veliger CO_2 Feasibility Study)



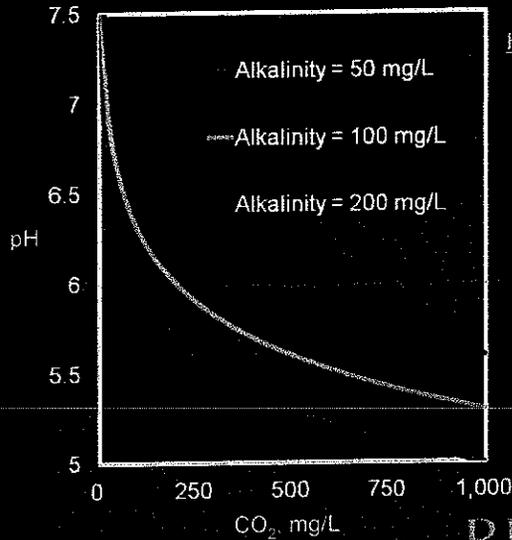
RECLAMATION

Carbon Dioxide Equilibrium



RECLAMATION

Effect of CO₂ Addition on pH



Henderson-Hasselbalch Equation

$$\text{pH} = \text{pK}_1 - \text{Log} \left(\frac{[\text{CO}_2]}{[\text{HCO}_3^-]} \right)$$

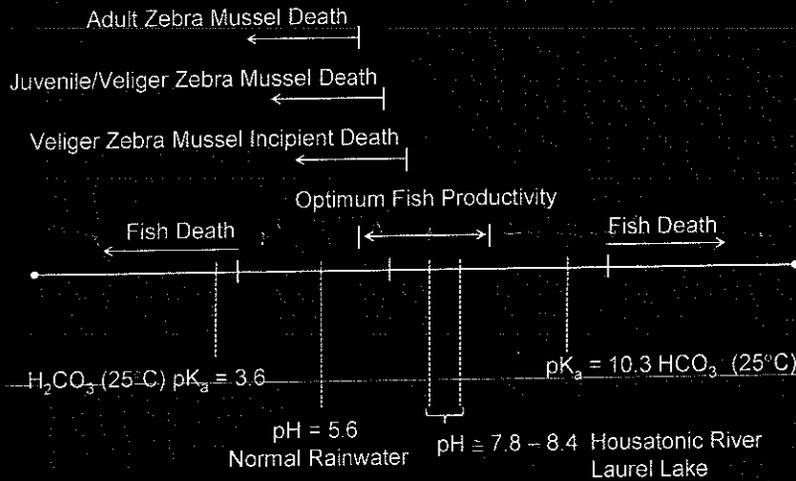
$\text{pK}_1 = 6.35 @ 25^\circ\text{C}$
(carbonic acid \leftrightarrow bicarbonate)

Housatonic River
Alkalinity = 130 – 145 mg/L
pH = 7.8 – 8.2

Laurel Lake
Alkalinity = 160 – 165 mg/L
pH = 8.1

RECLAMATION

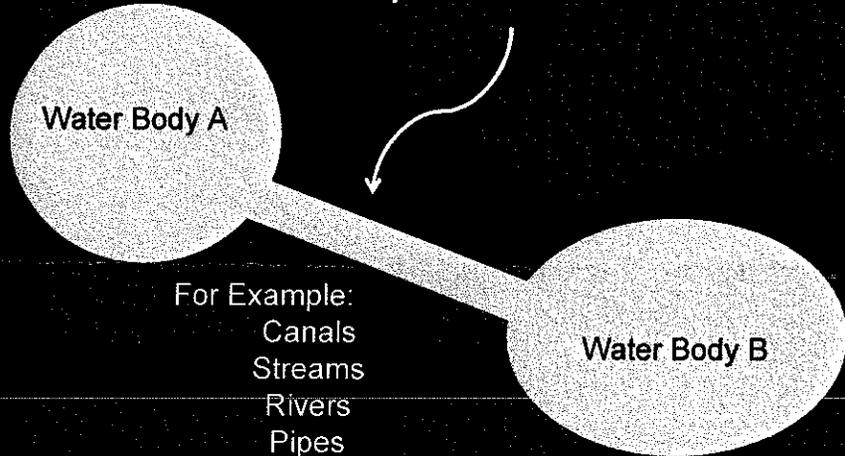
pH Adjustment



Note: Flora not expected to be impacted negatively. They use CO₂ for respiration.

RECLAMATION

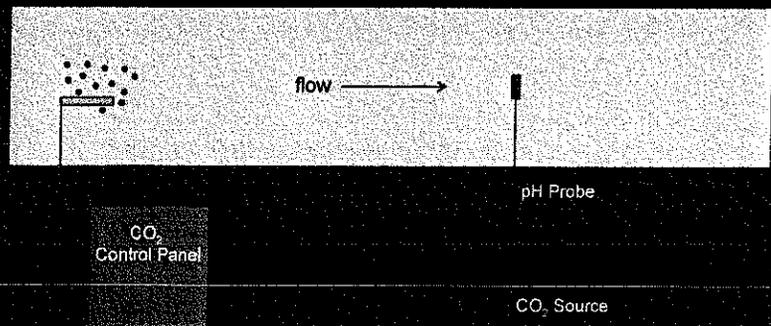
CO₂ Treatment at Chokepoints or Bottlenecks



- For Example:
Canals
Streams
Rivers
Pipes
Dams
Pumping Plants

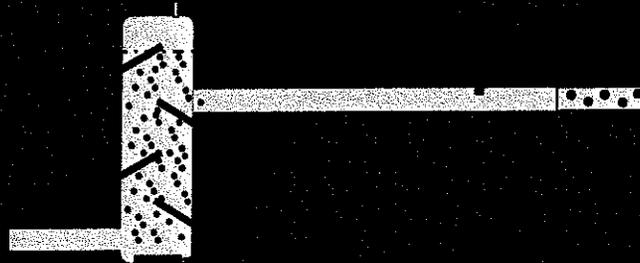
RECLAMATION

CO₂ Injection System Basic Setup for CO₂ Control



RECLAMATION

Apparatus for Veliger CO₂ Feasibility Study

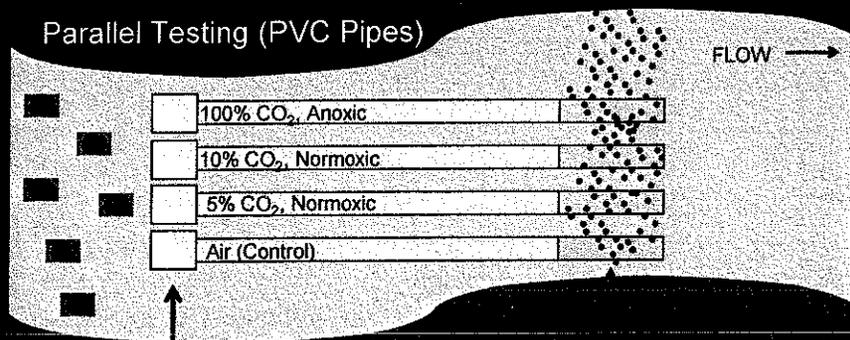


Controlled Study in a Field Laboratory
Provides Site-Relevant Data!

RECLAMATION

Possible Field Experimental Plan Veliger CO₂ Feasibility Study

Parallel Testing (PVC Pipes)



Carbonation Boxes (pexiglass)
Plumbed for Separate Dosage and Controlled Pressure

RECLAMATION

Experimental Parameters

- CO₂ Dosage (P_{CO2})
- Alkalinity, pH, and Temperature
- Flow, Time, and Distance
- Veliger Mortality (Lack of Motility)
- Veliger Size (?)

RECLAMATION

CO₂ SYSTEM OPERATION AND MAINTENANCE

Acute human health effects of high concentrations of carbon dioxide

<u>Concentration</u>	<u>Time</u>	<u>Effects</u>
2%	Several hours	Headache, dyspnea upon mild exertion
3%	1 hour	Dilation of cerebral blood vessels, increased pulmonary ventilation, and increased oxygen delivery to the tissues.
4-5%	Within a few minutes	Mild headache, sweating and dyspnea at rest.
7-10%	Few minutes	Unconsciousness or near unconsciousness.
	1.5 minutes – 1 hour	Headache, increased heart rate, shortness of breath, dizziness, sweating, rapid breathing.
10-15%	1+ minute	Dizziness, drowsiness, severe muscle twitching and unconsciousness.
17-30%	< 1 minute	Loss of controlled and purposeful activity, unconsciousness, convulsions, coma and death.

U.S. EPA, Report EPA 430-R-00-002, 2/2000

RECLAMATION



Thank you!

Candlewood Lake Authority

Connecticut Light & Power

Ellen Knowles Harcourt Foundation

Western Connecticut State University

RECLAMATION

RECLAMATION

Managing Water in the West

Any Questions?

Kevin L. Kelly

kkelly@usbr.gov

Established in 1902, Reclamation is best known for the dams, hydropower plants, and canals it constructed in the West, including Hoover Dam on the Colorado River and Grand Coulee Dam on the Columbia River. Reclamation is the largest wholesaler of water in the country, bringing water to more than 31 million people, and providing one out of five Western farmers with irrigation water for 10 million acres of farmland that produces 60% of the nation's vegetables and 25% of its fruits.



U.S. Department of the Interior
Bureau of Reclamation

