



# ***LITTLE RIVER NEWS***

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FALL/WINTER 2015

**MAY PEACE AND SERENITY BE WITH YOU AND YOUR  
LOVED ONES THIS HOLIDAY SEASON**

## **ANNUAL MESSAGE FROM PRESIDENT TIM PHILLIPS**

**This is YOUR LMWCC!!!** Your organization has moved out on several fronts this past year. At our annual meeting we discussed going forward in pursuit of developing a Watershed Management Plan. This plan (WMP) is, in today's world of seeking funding for large projects, essential in competing for monies in both public (yup gov't) and private resources available for supporting LMWCC goals of maintaining and improving the river we help preserve and protect.

We completed a significant project to add fish cover below the weir by matching funds provided by the Little Manistee Land Owners Association. We also completed work on several bank erosion sites including a ramp for ingress and egress to the river at Johnsons Bridge. Approximately 65% of a major river habitat improvement project funded by the National Fish and Wildlife Service has been accomplished with completion scheduled for this upcoming winter/spring. Two studies formulating

the data needed to support development of a plan on river improvement projects were completed this past January.

Trout Unlimited made a presentation at our annual meeting of their Assessment of Instream Fish Habitat, and Conservation Resource Alliance also completed an in-depth Streambank Erosion Analysis from Kings Highway to the weir indicating some 82 locations in need of our attention. Volunteers successfully completed work on maintenance of three existing structures we installed in past years at both Driftwood Campground and Fox Bridge DNR access sites. Volunteers also supported completion of our annual Water Quality and Macroinvertebrate studies. Development of the WMP is well underway thanks to several members of your Board of Trustees; please note this is a long term process which will greatly involve not only our Board but several other individuals and organizations within the LMWCC and the greater watershed. (See President page #4 )

## LMWCC PURSUES WATERSHED MANAGEMENT PLAN

Through the indefatigable efforts of trustees Armas Soorus and Joyce Durdell, the LMWCC and the recently formed steering committee, the Little Manistee River Watershed Assembly, are making significant progress in the generation of an encompassing Watershed Management Plan. Developing a management plan that meets the stringent requirements of both the Environmental Protection Agency and the Michigan Department of Environmental Quality will enhance the ability to restore and protect our valuable resource and its surrounding drainage area.

The process began over a year ago with the board of trustees discussing the potential benefits of developing a plan. In March of this year, Rob Carson, head of the Manistee County Planning Commission, met with the board to discuss the value of watershed plans for property owners. The following month, Greg Goudy of the MDEQ attended the board's meeting to discuss the advantages of developing a plan meeting the requirements of both the EPA and MDEQ. Greg stated that among other benefits an EPA/MDEQ approved plan would broaden access to private and government funding for in-stream and other watershed improvements. This is especially important given that LMWCC is competing for funds with other watersheds in the area that already have completed approved plans.

The process was begun by enlisting support from local governing bodies of townships and counties through which the river flows. Next will be the recruitment of commercial entities, recreational groups, and other interested stakeholders in the watershed. These groups will identify problems facing the watershed including

erosion, land use problems, and pollutant contamination sources. Once the problems have been identified, a list of priorities for addressing the issues can be compiled. Finally a plan to address all of the issues and concerns will be created.

The steering committee has been working closely with the Alliance for Economic Success in Manistee as well as the Manistee County Community Foundation which will provide assistance in funding and managing the funds to federal standards during the crucial part of the process: The actual drafting of the plan. Due to the requirements of meeting EPA/MDEQ guidelines and the sophisticated monitoring of the watershed to be incorporated into the plan, it was deemed appropriate to look for input from experts with experience in the field of completing watershed management plans. The steering committee is vetting Public Sector Consultants from Lansing to provide that expertise. PSC has been influential in developing the following: the Greater Bear Watershed Management Plan, the Portage Lake Watershed Forever Plan Research and Development, and the Boardman River Watershed Prosperity Plan. PSC will be interactive with LMWCC and the steering committee in educating property owners and all other affected parties within the watershed about the benefits of embracing a management plan, and they will be working with local townships and municipalities to ensure agreement, support, and compliance throughout the watershed.

The trustees of LMWCC have created three funds with the Manistee County Community Foundation to provide financial resources to begin this arduous task: First, a **Plan Fund** to fund the development of the Little Manistee River (See WMP page #4 )

## ANNUAL MEETING



Trustees set up on Friday evening for the annual membership meeting

Raffle Prizes — an Old Town kevlar canoe and two matching kayaks



Jeremy Geist of Michigan Trout Unlimited discusses the findings of the TU conducted habitat survey and fish population survey

## ANNUAL MEETING (CONT)

### SALES AND EXPENSES

<u>SALES</u>	2013	2014	2015
Apparel Sales	\$300	295	232
Bucket Raffle	627	740	902
Large Raffle	3,446	3,630	2,025
Silent Auction	512	180	
 <u>EXPENSES</u>			
Kayak		500	848
Meeting	1,073	474	662
<u>PROFIT</u>	3,812	3,871	1,649

### WMP continued from page #2

Watershed Management Plan. Second, an **Implementation Fund** is to fund the plan's long-term support. Lastly The **LMWCC Endowment Fund** is to provide a place for some LMWCC operating funds and provide better return on investment than we get from the current bank account. Opening the **Plan Fund** is aimed at seeding efforts to attract corporate funding to underwrite the bulk of the costs for producing the plan. Once the plan is in place the **Implementaion Fund's** purpose is to provide an initial contribution to encourage further donations to the continued support of the maintenance of the plan.

Obviously the process is in its very early stages, but much has been done since the board began developing the idea of completing a watershed management plan. LMWCC membership will be kept apprised of each step of the process via the newsletter and discussions at future annual meetings. We are also adding a Watershed Management Plan section to our web site to help keep members and

the public aware of the status. Members are encouraged to express their ideas and responses at those open meetings or email [littlemanwsassy@gmail.com](mailto:littlemanwsassy@gmail.com).

### President cont. from page #1

These are only some examples of what your organization has undertaken and completed this past year. This newsletter and our on-line web site (LMWCC.ORG) have a most complete detailed accounting on the many projects undertaken by your organization, the LMWCC. Won't you please join all of us who are already involved?? Doing so is as easy as just asking how to get involved. The organization is only as strong and can do only as much as our VOLUNTEERS are willing to jump-into. Wishing you all a very Merry Christmas and prosperous New Year. I remain.....

Tim Phillips,  
President LMWCC



President Tim Phillips addressing the membership at the annual meeting in July

**On the following page are the results of this year's annual water quality survey conducted on the 22<sup>nd</sup> of July. Below is a brief explanation of the effects of the chemicals tested for and found in the Little Manistee River.**

**E.coli**, is a fecal coliform, and a biological contaminant that can be found in streams and lakes. It is a bacteria that colonizes the intestines of warm-blooded animals and humans. **High counts over 300 colonies per 100 ml of water** is of concern to people who spend time recreating in lakes or rivers. High E.coli counts can also adversely affect dissolved oxygen levels, see **BOD** below.

The following chemicals/compounds, in excess, contribute to eutrophication, which is the excessive richness of nutrients in bodies of water. High quantities of nutrients create explosive growth in aquatic plants, exceeding the **BOD or Biological Oxygen Demand**, the amount of oxygen required to decompose organic material. A BOD that exceeds the available oxygen produces dangerous levels of carbon dioxide, toxic to many forms of animal life.

**Ammonia** - Amounts greater than 0.05 mg/L indicate the presence of ammonia. Higher amounts may indicate a pollution source.

**Nitrate/Nitrites** - Nitrates above 1.00 mg/L or Nitrites above 0.05 mg/L may indicate a pollution source.

**Phosphates** - Less than 1.0 mg/L is considered acceptable for treated waters flowing into bodies of water from water treatment facilities.

**pH** - Water with a pH value of 7.0 is considered neutral. Any pH value under 7.0 is acidic while any pH value over 7.0 is considered alkaline/basic. **Slightly alkaline waters of around 7.5, support trout reproduction, survival, and growth the best.**

**Chloride** - Levels above 10 mg/L are reason to suspect contamination.

**Dissolved Oxygen** – The table below shows the relationship between water temperature and the solubility of oxygen at the elevation above sea level of the Little Manistee River.

Air Temperature - ° F	Oxygen in PPM
32°	14.6
41°	12.8
50°	11.3
59°	10.2
68°	9.2
77°	8.4
83°	7.6

A minimum of 4 ppm of dissolved oxygen is necessary for a viable aquatic ecosystem. **Fish thrive best in well oxygenated water at 7.0 - 9.0 ppm.** An adult brown trout thrives in water carrying levels of 9 - 12 ppm DO.

## LMWCC WATER QUALITY SURVEY — JULY 22, 2015

LMWCC Site #	Collection Location	*Total Coliform-colonies / 100 mL	**E. coli-colonies / 100 mL	Ammonia-mg/L	Nitrate-mg/L	T. Phos.-mg/L	***T.Phos.-Repeat mg/L	pH-pH units	Dslvd. Oxygen-mg/L	Chlor-ide-mg/L	Nitrite-mg/L	Air Temp.-°F	Water Temp.-°F
1	L.M. Below Luther Dam	1203	119	<0.05	<1.0	0.081		7.3	8.1	5	<0.05	75	60
2	L.M. Above Fairbanks Creek	2420	144	<0.05	<1.0	0.108	0.107	7.3	8.2	<5	<0.05	66	58
Duplicate	(above)	1553	133	<0.05	<1.0	0.219	0.197	7.4	8.3	<5	<0.05		
6	L.M. above Sayers Creek	980	96	<0.05	<1.0	0.057		7.5	8.5	9	<0.05	64	54
8	L.M. @ Spencer Bridge	1414	140	<0.05	<1.0	0.293	0.254	7.4	8.2	9	<0.05	69	63
Duplicate	(above)	1203	111	<0.05	<1.0	0.043	0.056	7.4	8.3	9	<0.05		
9	L.M. @ Johnson Bridge	1733	77	<0.05	<1.0	0.078	0.075	7.5	8.5	7	<0.05	70	66
Duplicate	(above)	1733	83	<0.05	<1.0	0.08	0.069	7.5	8.4	7	<0.05		
10	L.M. @ Dewitts Bridge	1986	49	<0.05	<1.0	0.077		7.5	8.3	7	<0.05	70	64
11	L.M. @ Poggensee Bridge	1300	81	<0.05	<1.0	0.091	0.058	7.5	8.4	7	<0.05	75	66
Duplicate	(above)	921	81	<0.05	<1.0	0.025	0.068	7.5	8.2	7	<0.05		
12	L.M. above Cool Creek	1046	52	<0.05	<1.0	0.042		7.5	8.1	7	<0.05	67	59
13	Cool Creek @ 18 Mile Bridge	>2420	133	<0.05	<1.0	0.019	0.019	7.5	8.2	5	<0.05	69	64
Duplicate	(above)	>2420	158	<0.05	<1.0	0.019	0.019	7.5	8.2	5	<0.05		
18	Cool Creek @ Hamilton Road	1553	11	<0.05	<1.0	0.185	0.187	7.3	8.4	7	<0.05	75	73
Duplicate	(above)	1300	16	<0.05	<1.0	0.155	0.202	7.3	8.4	7	<0.05		
19	L.M. @ 9 Mile Bridge	>2420	184	<0.05	<1.0	0.243	0.124	7.5	8.2	7	<0.05	65	60
20	L.M. @ 6 Mile Bridge	1553	72	<0.05	<1.0	0.069	0.063	7.6	8.2	7	<0.05	70	60
21	L.M. @ DNR Wier	1203	55	<0.05	<1.0	0.109		7.6	8.4	7	<0.05	72	60
Duplicate	(above)	1300	84	<0.05	<1.0	0.063		7.6	8.3	6	<0.05		
22	L.M. @ Stronach Road	1986	49	<0.05	<1.0	0.117		7.7	8.8	6	<0.05	72	62

**LITTLE MANISTEE RIVER**  
**MACROINVERTEBRATE SURVEYS 2007 — 2015**

<b>COLLECTION SITES:</b>	<b>YEAR &gt;</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>AVG.</b>
	Day >	5/6	5/23	5/5	5/13	5/7	5/11	5/16	5/31	5/16	2007-2015
Below Queen's Highway		45	35	37	36	27	36	42	36	52	39
Old Grade Campground		49	40	35	36	35	56	54	42	46	44
Johnson Bridge		20	31	32	37	NS	33	45	59	51	38
Dewitt's Bridge		24	35	28	30	36	34	43	50	43	36
Poggensee Bridge		NS	33	NS	28	51	23	36	22	39	33
Cool Creek		47	23	32	NS	NS	48	22	35	35	35
Bear Track Campground		25	18	23	28	27	38	46	43	43	32
9 Mile Bridge (south)		35	5	36	39	46	26	43	42	35	34
Bowman's (Cross Hole)		45	25	31	26	47	32	28	39	NS*	34
6 Mile Bridge NW Access		NS	NS	NS	NS	NS	NS	NS	NS	47	47
<b>AVERAGE/YEAR/SITE&gt;</b>		36	27	32	33	38	36	40	41	43	36

**Rating:**

**EXCELLENT** >48  
**GOOD** 34 - 47  
**FAIR** 19 - 33  
**POOR** <19

## LITTLE MANISTEE RIVER WEIR STATISTICS FOR THE LAST TWENTY YEARS

Year	Spring Steelhead	Fall Chinook	Fall Coho	Fall Steelhead	Fall Brown Trout
1995	3,553	13,004	394	351	31
1996	9,057	17,090	2,572	5,249	174
1997	7,096	15,433	781	915	123
1998	4,005	7,170	1,463	888	28
1999	4,484	18,621	519	662	39
2000	4,236	13,029	600	319	74
2001	7,029	18,279	911	2,262	59
2002	6,290	19,385	538	120	38
2003	3,209	14,419	616	1,404	43
2004	2,571	15,618	1,102	1,074	60
2005	3,483	11,075	2,100	665	53
2006	2,949	12,772	238	417	56
2007	2,880	10,946	303	738	50
2008	3,441	5,169	172	406	58
2009	4,191	8,274	126	343	86
2010	1,961	5,776	203	91	32
2011	3,196	14,124	1,815	901	40
2012	4,818	12,327	1,333	283	103
2013	3,667	6,427	1,021	988	80
2014	2,767	2,781	760	392	79
2015	2,857	654	259	51	65
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TOTAL	231,843	814,583	672,410	91,396	3,705
AVERAGE	4830	16970	14009	1904	77

A quick look at the above chart shows a disturbing decline in the anadromous fish counts at the weir. In 1970 the high number of counted Chinook salmon was 34,190. The high number of Coho salmon recorded was 108,400 also in 1970. In the last twenty years 19,385 Chinook were counted in 2002. The high number of Coho was 2,572 in 1996. This fall marked the historic low number of Chinook counted, and given that the DNR expects to harvest eggs and milt from 1,250 **PAIRS** of Chinook, these numbers are alarming.

While the numbers of spring steelhead has remained relatively constant for the past ten years, the numbers are still well below the high number of 10,480 recorded in 1977. Likewise the number of fall steelhead passed through the weir has declined from the high of 7,411 in 1970.

In the interview with DNR fisheries biologist, Mark Tonello published in the Spring/Summer newsletter of this year, Mark indicated that one of the reasons for the decline in fish numbers is the lack of forage fish in Lake Michigan. He also added that continuing efforts to improve the quality and quantity of suitable fish habitat in the river should have a positive long term affect on fish populations.



## **Council News and News from Around the Great Lakes**

### **PAY PAL AVAILABLE**

The LMWCC website now has compatibility with Pay Pal. This means that membership renewals can be made via the website. Also additional donations to the Council and the Howard Roberts Memorial Fund can also be done through the Council's Pay Pal account.

### **COOL CREEK CROSSINGS**

Steve Leonard of the Lake County Road Commission attended the trustees' board meeting in November to discuss the two crossings of Cool Creek on 111/2 Mile Road. Steve indicated the crossings were contributing sediment to Cool Creek and in high water that was washing down to the mainstream. Steve projected the costs to remediate the problem at \$267,338 per site. In addition each site would demand \$20,000 to cover the costs of environmental surveys and permits for the proposed work. He indicated that Lake County would provide labor as its contribution to the project. The trustees will take up this issue at the December meeting.

### **SS BADGER**

This summer was the first year in its 62 year history that the Badger sailed between Manitowoc, WI and Ludington without dumping its residual coal ash and mercury into the Lake Michigan. After paying a \$25,000 civil penalty, the company that owns the ship was ordered to stop dumping its fuel waste by 2014. EPA documents show that the ship was dumping 4 tons of coal ash and mercury

into the lake each day. The ship's owners spent nearly \$2.5 million dollars to install a system that pipes ash from the ship's boiler to holding bins, and it is reused for road projects. The U.S. Coast Guard inspected and approved the ship before its first crossing in May.

### **LAKE MICHIGAN**

Lake Michigan water levels have dropped more than an inch since last October. Meteorologists blame this on the very dry October weather. Surprisingly the water temperature is one degree cooler than it was a year ago.

Four of the Great Lakes experienced a decrease in normal precipitation totals: Lake Superior's drainage basin had received 90% of its normal precipitation, Lake Michigan 63%, Lake Huron 90%, and Lake Erie 99%. Only Lake Ontario's drainage basin had received more precipitation than normal, 113%.

### **EROSION SURVEY**

The CRA survey, "Little Manistee River Eroding Stream Bank Assessment" can be viewed through a link on the LMWCC website. Completed by Nate Winkler, biologist with Conservation Resource Alliance, the survey covers the river from Carrieville (King's Highway) Bridge to Old Stronach Rd. Bridge and identifies sixty-eight erosion sites in need of remediation. The survey ranks each site based on its severity of erosion. There were twelve sites deemed severe, thirty rated as moderate, and twenty-six defined as minor.

## SYERS CREEK UPDATE

In August of 2014, the board of trustees became aware that the streambed of Syers Creek below a private sand berm dam was completely dry. What made



Syers Creek streambed below the dam

the news particularly distressing is that Syers Creek was the site of a habitat restoration project funded in part by a grant from Patagonia in 2012.

Upon investigation it was found that the berm, privately owned and providing access to private property, has dammed drainage into the creek and flooded a natural wetland behind. The 120' long and 6' high berm restricts movement of aquatic species, increases sedimentation and elevates water temperatures behind it. Nate Winkler and Kira Davis of CRA have worked closely with the Natural Resources Conservation Service and the Grand Traverse Band of Ottawa and Chippewa Indians this fall to complete initial site surveys at the dam.

CRA's Winkler and LMWCC president Tim Phillips have been in contact with the owner of the property, and he has pledged his cooperation with plans to remove the dam and restore the wetlands to their natural state. Removal of this barrier will not only return the natural flow to the creek, wetland areas will also be reclaimed from underneath the unnaturally high lake. As we experience more severe weather events, these wetlands are critical buffers that help manage additional runoff.



The flooded wetlands above the berm dam on Syers Creek

CRA has applied to the US Fish and Wildlife Service for a grant to help fund removal of the dam. Besides restoring the natural flow to Syers Creek, removal of the berm should also considerably lower the temperature of the creek by allowing the wetlands to filter and percolate surface water before entering the stream.

Syers Creek has historically been a prime Brook Trout habitat, and we hope it will be so again.

**THIS WAS JUST RELEASED BY TROUT UNLIMITED 11/17/2015****ACTION ALERT**

For about a year, aquaculture interests in Michigan have agitated to get the State of Michigan to permit fish farms in the Michigan waters of the Great Lakes. You may have seen some examples of the media and public relations campaign through which those interests have put their slant on the prospects of this proposed activity. Their material may not have had much traction with members of the angling and cold water conservation communities who are all too familiar with the sad results of open water net pen aquaculture in so many locations around the world, but it has propelled Michigan government to serious consideration of permitting the practice, even to consideration of possible sites for it in the waters of Lake Michigan. Recently, Michigan government agencies posted a suite of expert studies on the possibilities and scheduled a public information and comment session in Gaylord for Nov. 19, 2015 (<http://www.michigan.gov/som/0,4669,7-192-29938-368780--,00.html>). Unfortunately, the studies are not free of vested interest. Fortunately, Michigan has also established a mechanism for those of us who cannot attend to express our assessment of the prospect of open water net pen aquaculture on our shared Lake.

The Michigan Council of Trout Unlimited has stayed abreast of the development of this issue. "MITU views the possible introduction of net pen fish farms into Great Lakes waters as one of the largest threats facing our coldwater fisheries today." It adopted an aquaculture policy calling for assured prevention of the kinds of environmental harm that net pen aquaculture facilities typically produce (<http://www.michigantu.org/index.php/michigan-tu-contacts-2/michigan-tu-contacts-4/wild-fisheries-conservation/aquaculture-policy>).

The Council's Executive Director published his take on the situation in *Michigan Trout* ([http://www.michigantu.org/images/michigan\\_trout/Michigan%20Trout%20Spring%202015%20-%20final%20web.pdf](http://www.michigantu.org/images/michigan_trout/Michigan%20Trout%20Spring%202015%20-%20final%20web.pdf) see p. 12) and has espoused the Council's opposition in other media outlets in the State. This week, the Council also asked its members to attend and comment at the above mentioned public meeting or to E-mail their comments to the address indicated above.

If you are an advocate for the restoration of native trout to the Great Lakes, if you fish for those migratory Chinook, Coho, browns, and steelhead in tributary rivers, if you chase any of these fish on the Big Lake or at its shoreline, or if you just want to assure that our big chunk of the world's fresh water remain clean and free of pollution, YOU have a dog in this fight. It is very easy to express your opinion. Just click on this link which will open up your E-mail program with an E-mail form addressed to the correct address ([DNR-Net-Pen-Comments@michigan.gov](mailto:DNR-Net-Pen-Comments@michigan.gov)). Then put your opinion into the E-mail screen that pops up and send it on its way.

Below are short versions of some of the reasons the Illinois Council and others do not think open water net pen aquaculture has a place on the Great Lakes. You might want to incorporate some or all of these statements into your E-mail.

Fish invariably and routinely escape from aquaculture net pens and cages and not infrequent accidents release them in large numbers. These escapes have documented negative genetic effects on native or wild populations of the same and closely related species. If the escapees are of a non native species, they may found (and have founded) viable populations and become pernicious invaders themselves. Escapees also transmit disease to and compete with all susceptible aquatic species.

The crowded conditions in net pens and cages make them breeding grounds for fish disease and parasites that spread to nearby free ranging fish. Aquaculturists routinely lace their feed with antibiotics and pesticides just to keep their fish alive, while subjecting native and wild aquatic populations outside the cages to increased detrimental exposure, greater incidence of disease outbreak and greater severity of outbreaks. Moreover, this preemptive dosing with antibiotics accelerates declines in drug effectiveness and drug resistant maladies, while pesticides lead to unknown impacts on other aquatic animals.

Aquaculture uses hormones to promote faster growing and larger crops. Unknown portions or metabolites of these chemical compounds are passed on through excrement to have still poorly understood effects on other aquatic populations and on public water supplies.

Net pen and cage operations in the US waters of the Great Lakes would discharge very significant amounts of untreated animal excrement, dead animals, uneaten food, food additives, hormones, medications, pesticides and chemicals used to maintain the pens directly into the water. Volumes depend on pen size and numbers, as well as the fish species farmed, but these volumes are the equivalent to the effluent releases of small to medium sized cities. However, open water fish farmers do not treat that waste like our municipalities must!

In the Great Lakes, where there are no tides to help disperse wastes, cage and net pens will concentrate effluent, stifle existing bottom life, and facilitate conditions conducive to algal blooms, including blooms of poisonous species like *Microcystis* that cut off the public water supply of Cleveland a summer ago.

Nutrient effluent from open water fish farms reduces dissolved oxygen and exacerbates conditions leading to dead zones, even as Great Lakes state and federal agencies, farmers, municipal sewage plants and others undertake costly efforts seeking to reduce anoxia in parts of the Great Lakes, including parts of Lake Michigan.

Fish farms can definitely interfere with other beneficial uses of near shore areas, limiting recreational and commercial boating and paddling of all types, recreational fishing, use of adjacent beaches, swimming, appreciation of lake vistas, and the like. The muck from near shore fish farms has itself prevented the use of beaches for other activities.

Over their lifetime, farmed fish require a greater weight of fish protein in their food than they contribute to the human food supply. Indeed, one sixth of the total fish harvest worldwide is used to make aquaculture fish food. Harvesting of forage species to feed aquaculture fish is devastating these species worldwide.

Aquaculture operations typically exploit nearby sources of fish protein to produce the less expensive feed needed to stay viable and Michigan's studies already suggest the likelihood of in-state fish meal mills. However, the Lake MI - Huron complex is not an ocean with a vast forage base that can be exploited in support of aquaculture. Indeed, the amount of forage in these lakes has become a limiting factor for commercial and recreational fisheries and is currently near historic lows. The forage base cannot sustain fishing in support of aquaculture.

Recreational fishing and tourism produce multiples of the small economic impact that might be expected from net pen aquaculture in the Great Lakes. Studies suggest that the combination of production cost and environmental costs of open water aquaculture actually make it an unprofitable choice.

**YOUR TRUSTEES****2014**

Tim Phillips	President
Jim Squier	Vice President
Dan Sernick	Treasurer
Evelyn Furman	Secretary
Dale Downes	Membership
Joyce Durdell	Water Quality
David Spruance	Newsletter
Joe Rogers	SWAT
Armas Soorus	WMP
John Miller	River stewards
John Gorys	Emeritus
Kaye McDonald	Emeritus
Gordon Lewis	Emeritus

**OTHER NON-TRUSTEE CO-ORDINATORS**

Anna Jo Rogers    Web Site

**The Council is looking for anyone with grant writing experience to help in our efforts to secure funds for our on-going restoration and protection efforts.**

**Membership renewal** forms will be sent out before year's end. Please take a moment to renew your annual membership and consider adding to your dues with a contribution. Remember the monies donated to the **Howard Roberts Memorial Fund** are used solely for in-stream improvements and habitat enhancement. And you can now renew at The LMWCC website using Pay Pal. Also please consider what you can do for the Council in non-monetary ways. We always need volunteers to assist with our on-going work: Water Quality and Macro Invertebrate surveys, in-stream work projects, and solicitation of donations for the annual meeting.

**OUR MISSION**

Is to bring together persons and organizations who have an interest in the resource conservation and restoration of the Little Manistee River and its watershed. Our goals are to restore, protect, and preserve the natural character of the watershed by communicating resource problems and then offering and implementing problem resolution. We are a state chartered non-profit, tax-exempt organization. All contributions are tax deductible under §501{3} of the IRS code. Our business is conducted by a council of trustees elected by the membership. All positions are voluntary, non-compensated.