

The Upper Peninsula Environment

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A Review of Worst Management Practices on the Mulligan Escarpment

Greg Corace and Chris Burnett

On 11 August 1999, the UPEC Forestry Committee met to review those conditions which exemplify "Worst Management Practices" (WMPs) as they pertain to soil and water conservation. Joined by representatives of the Marquette Soil and Water Conservation District and the Michigan Department of Environmental Quality (DEQ), members of the committee were given a tour by a landowner and his forester of a remote 240-acre property located in northern Marquette County (T49N, R28W).

The property was previously owned and logged (winter 1997) by a firm from Wisconsin, and was purchased by the present owner from that firm about a year ago. The land can be characterized as rugged, with numerous severe slopes, is dominated by northern hardwoods, and lies within the Mulligan Creek watershed.

The committee was shown the effects that poorly designed and/or illegal management practices (primarily creek crossings) have had on the property. Extreme erosion on steep skid roads is causing a delta of sediment to spread across a forested wetland. Also, an illegal stream crossing and the placement of culverts by simply laying them in the stream

bed, thus blocking natural water flow, were noted.

Since this tour, the committee has been party to an inquiry by the Land and Water Management Division of the DEQ for violations of Part 91, Soil Erosion and Sedimentation Control and Part 301, Inland Lakes and Streams, of the Natural Resource and Environmental Protection Act, 1994.

Even though the former landowner has not been forthright in admission of responsibility for the present problems, he is taking part in discussions as to provision of financial assistance in the restoration of some features of the property.

UPEC has been, and will continue to be, active in this process. DEQ representatives have pointed out the fact of their limited resources, which means that ground-based observations by private citizens and organizations are necessary in most instances to identify cases of WMPs.

The Forestry Committee has also learned through this experience that it is far easier to get corrective action if the DEQ is notified while the work utilizing such practices is still in progress.

All citizenry, and particularly UPEC citizenry, can help in this process. If you observe or are aware of questionable (potentially worst) management practices, let it

be known. Let us know, if you aren't sure where to go next, and we can put you on the right track. Our access numbers are in the box on page 7 of this letter.



MERCURY IN NATIVE ORES: AN UNEXPECTED SOURCE OF MERCURY TO LAKE SUPERIOR SEDIMENTS

Holley Linn

The recent PhD (biology/ecotoxicology) defense at Michigan Technological University by UPEC board member Sandra Harting dredged up (you should pardon the pun) some interesting facts about mercury in Lake Superior sediments.

At present, the IJC (International Joint Commission) maintains that most (approximately 95%) of contaminant loadings to Lake Superior sediments come from long-distance atmospheric deposition, i.e., it blows in to the lake from somewhere else. This is probably true for organic contaminants such as PCBs and DDT, and for mercury loadings to the rest of the Great Lakes.

However, the natural occurrence of metals in local ore deposits, along with the past practice of discharging mine waste along the Lake Superior shoreline, suggests otherwise for Lake Superior sediments.

Hg

Ms. Harting's research, based upon evidence from Lake Superior sediment corings, and subsequent efforts to trace the source of metal, especially mercury, loadings to the lake reads like a scientific detective story.

Previous sampling efforts of Lake Superior sediments have treated this, the second-largest lake in the world, much like any small inland lake—only a few cores were taken from the deepest, central parts of the lake—and then comparison of mercury loadings from these few cores with direct measurements of atmospheric deposition, which led investigators to conclude that most of the mercury entering the sediments was of atmospheric origin.

However, very extensive coring (32 cores) of Lake Superior, performed by NOAA (National Oceanographic and Aeronautics Administration), covering both offshore and nearshore regions of the lake, told a very different story. To begin with, NOAA cores taken from the deep-water, off-shore regions revealed what appears to be a typical atmospheric deposition pattern, with low levels of mercury, similar to those found by the earlier investigators.

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On the other hand, levels of copper, silver, and mercury steadily increased the closer the sediments were located to nearshore regions, particularly those regions near old mining discharges. Many of the nearshore cores had deposition patterns indicating much higher inputs of these metals occurred in the past.

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Mercury and silver concentrations in these cores correlated strongly with each other, suggesting a common, terrestrial, rather than an atmospheric, source of these metals, as silver does not normally cycle in the atmosphere.

Where did the extra mercury come from?

Old tailings piles from native (occurring as free metal) copper, silver, and gold mining operations are scattered around three-quarters of the Lake Superior shoreline. On the Keweenaw Peninsula, native copper and silver was recovered from the parent rock by the process of "stamping"—crushing the rock with steam-driven stamps to free the native metals, followed by sluicing the crushed "stamp sands" into waterways or along shorelines. This, by the way, is the composition of the "black sand" that can be seen on so many beaches along the peninsula.

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From the Keweenaw Peninsula mills alone, approximately a *half-billion* metric tons of stamp sand were discharged directly into the Keweenaw Waterway or along the shoreline of Lake Superior.

In the course of Ms. Harting's field work, cores were also taken from the Keweenaw Waterway itself. Again, copper and mercury levels from these cores were very high, approximately ten times higher than the nearshore Lake Superior cores. Anthropogenic (human caused) mercury

and copper levels were highly correlated between Keweenaw Waterway, L'Anse Bay and near-shore Lake Superior cores, suggesting a common type of source.

As with the nearshore Lake Superior cores, the high correlations between mercury and silver suggest a terrestrial rather than an atmospheric source. The Keweenaw Waterway sediments consist mainly of purple-red slime clays, the finest fraction of stamp sands, and exhibit a distinctive banding pattern which corresponds to annual summer and winter mining discharges.

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Other investigators have used neutron activation analysis, a technique which simultaneously analyzes 32 separate elements, with which they were able to match the elemental composition of Keweenaw Waterway sediments with shoreline stamp sand discharges.

Mercury contamination of this type, associated with mining, could possibly come from two sources: 1) mercury used in metal extraction procedures (gold and silver amalgamation), or 2) as a naturally occurring amalgam within silver-rich copper and gold deposits. However, inspection of historic manufacturing and supply records housed at the MTU archives revealed no use of mercury for extraction purposes in Keweenaw Waterway native copper mining operations.

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Analysis of samples from shoreline stamp sands, poor rock, and native copper and silver, however, revealed that the mercury was actually associated with the native metals themselves, whereas analysis of the parent rock revealed mercury present only in very small concentrations.

Clearly, the process of native metal mining and milling moves naturally concentrated geologic sources of mercury to the surface as ores, tailings piles and poor rock, where these mineral constituents are then subjected to weathering, leaching and dispersal. Further, the smelting of native copper simply released mercury directly into the atmosphere.

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Ms. Harting's research calculated regional atmospheric deposition rates of copper and mercury from a series of sediment cores obtained from small, isolated, inland lakes. Atmospheric deposition rates derived from these cores corresponded well with previously published, single-lake and direct-air monitoring studies.

She found that comparing the atmospheric deposition rates from this study to a recent study of mercury loadings to Lake Superior sediments reveals that only approximately 25% of mercury entering Lake Superior sediments comes from atmospheric sources. Therefore, 75% of the mercury must come from land-based sources.

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This does not mean that that coal-burning, chloralkali plants, or municipal discharges are not significant sources of mercury loadings to lake sediments. The *amount* of mercury entering the lake from the atmosphere has not significantly changed within the time frame studied; however, the total amount of mercury entering the lake from all sources has been found to be much higher than was previously thought.

Mercury, as a naturally occurring amalgam associated with the native copper, silver, and gold that was mined in the region, constitutes an additional, heretofore

unrecognized source, over and above the previously recognized sources of mercury loadings to Lake Superior sediments.

Is this "new" source of mercury something to be worried about? It depends on whether the mercury can become methylated, thus making it available to accumulate in the food chain.

Ms. Harting hopes that future research on this topic will answer that very question. In the meantime, if fish is your dish, broil it —see below.

Hg

MERCURY: FROM THERMOMETERS TO FISH CONSUMPTION

Patti Clancy

Mercury: Hg, that silvery liquid inside the bulb of a thermometer. Probably everyone has experienced the accidental breaking of a thermometer, releasing the liquid metal that splits into glassy-appearing beads that slither and dart away when you try to pick them up.

Because of its chemical properties, such as expansion and contraction in response to temperature and pressure changes, mercury has long been used in instruments and gauges that perform a variety of functions.

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Look around you: In addition to thermometers, mercury is a component of fluorescent lamps, heat sensing switches, mercury vapor lamps, blood pressure cuffs, dental amalgams, gauges, etc. Mercury-containing compounds are found in cleaners, disinfectants, inks, paints, plastics, solvents, wood preservatives,

cosmetics, medicines, ointments and countless other commercial products. It's safe to say that the use of mercury, in one form or another, is quite, quite widespread.

Which leads to the problematic aspect of mercury. Because it is toxic at very low concentrations, slight increases in the amount of mercury in the environment can cause serious health effects to humans as well as wildlife.

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In recent years, low-dose mercury exposure has been studied extensively, with results compiled about sources of mercury pollution.

It is estimated that about two-thirds of the mercury in the atmosphere comes from manmade sources—primarily coal burning power and incinerators. Once it is discharged into the air, elemental mercury is brought back down to earth by rain, which then drains to lakes and rivers, and is then converted to an organic mercury compound which can then enter the food chain.

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It takes only a very small amount of mercury to render fish unsafe for human consumption—0.002 pounds of mercury (1/70th of a teaspoon) is enough to contaminate all the fish in a 25-acre lake to the unsafe-to-eat level. A typical 100-megawatt coal-burning power plant emits approximately 25 pounds of mercury a year.

In Michigan today, 41% of mercury emissions come from coal-fired power plants, while 10% is derived from the burning of medical waste.

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In the last several years, the National Wildlife Federation has developed a program to eliminate medical waste as a source of mercury contamination in the environment. This program educates health care providers (hospital, medical and research professionals) about mercury pollution, and why it makes sense to eliminate the use of mercury-containing devices and products. Many hospitals, nationwide as well as in Michigan, and including the University of Michigan Health System, have signed a pledge to become mercury-free.

The NWF and the Marquette Area Wastewater Treatment facility teamed up recently to present a conference in Marquette entitled "Working toward a Mercury-free U.P." Those attending the conference learned everything they may ever have wanted to know about mercury—and then some—such as, for instance, what is required to clean up a mercury spill.

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Diane Thompson, a wastewater official from the City of Superior, Wisconsin, described, step by step, the painstaking remediation process required following the rupture of a mercury-containing gauge at the Superior wastewater treatment plant.

When mercury is spilled, it can evaporate at room temperature (imagine a metal evaporating!), making it easily inhaled, so clean-up crews have to wear breathing masks as well as protective suits. Diane and other speakers attested to the high cost of cleaning up after a toxic mercury "event," as compared to the preventive approach of switching to nonmercury-containing products.

Fortunately, as noted above, the State of Michigan appears to be taking action to reduce mercury pollution, having included mercury reduction measures in a re-

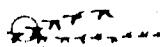
cently developed "P2" (pollution prevention) campaign. Additionally, the NWF has made mercury pollution reduction a top priority, along with such groups as Health Care Without Harm—an organization of health care providers whose mission is to prevent pollution caused in the medical setting.

Hg

Locally in Marquette, the wastewater treatment facility and the Mercury Reduction Committee are planning ways to educate the public about mercury pollution.

So there are some encouraging efforts being undertaken to reduce mercury emissions and, hopefully through such efforts and new public policies, we'll someday be able to catch our fish and eat it too—safely.

To learn more about mercury pollution and prevention, contact Molly Chidsey and/or Tony DeFalco of the National Wildlife Federation at 734-769-3351 or www.nwf.org/greatlakes



Ed. note: Mercury is a cumulative poison in the body, and there is no barrier keeping it from reaching brain cells—it is retained in the pain center of the brain and the central nervous system.

Still, if eat fish you feel you must, experts recommend broiling it, and not basting it with its own juices.



HUMANS AS HUNTERS

[Reflections and musings from UPEC board member Bill Robinson, retired academician.]

The hunting seasons are upon us.

Environmentalists are often divided as to whether humans, at this stage of civilization, should continue to invade the habitat of wild creatures with weapons in hand, with the intention of killing and eating some of the animals with which we share the earth. Somehow, fishing is less condemned.

Persons, such as I, who hunt, should look into ourselves and ask why we enjoy hunting. Why not use a camera? Certainly getting a good picture of a wild deer requires more skill than shooting one with a rifle.

The British ecologist, Charles Elton, in an article in an early volume of *The Journal of Wildlife Management*, pointed out that nearly all athletic contests are rituals, involving three elements: predator, prey and cover. He suggested that humans find the interactions among these elements irresistibly exciting.

For example, the football player carrying the ball is akin to a prey animal seeking "cover" (the end zone) for six points, while ten other players give him temporary cover against eleven predators on the defense. Failing to reach the end zone, the prey may, if close enough, attempt to

get 3 points by kicking the ball (prey) between the uprights of the goal post.

In baseball, the predator/prey relationship is more complex. The pitcher attempts to put the ball (prey) past the batter (predator), through the strike zone, into its cover (the catcher's mitt). Upon hitting the ball within a clearly marked 90-degree angle, the batter (predator) immediately becomes the prey and his cover is first base, (to which he scurries), and thereafter second and third base, and eventually the home plate. If the runner is successful in arriving at home plate without being caught away from cover, one "run" is put on the scoreboard.

Almost all popular sports are based upon these three elements of predator/prey/cover, with millions of people watching and cheering. Some sports, such as diving and gymnastics, require at least equal skills as those of baseball, football, hockey and basketball. But without the predator/prey/cover relationships, they do not generate the sheer excitement the others do. They lack those three essential elements.

Given our inherent interest as predators (we have eliminated most of the predators that feed on humans), many of us find hunting stimulating and elemental, an activity in which we are not simply spectators or players in a game, but actually participants in nature as a predator.

About 30 years ago, Dr. Steve Kellert of Yale University found that not all persons who hunt do so for the same reasons. As part of an overall study of attitudes of humans toward other animals, Dr. Kellert found that hunters fell into three different, but not mutually exclusive, categories.

The *dominionistic* or "sport" hunter is one who attempts to dominate his prey. He (these are almost entirely males) is interested in killing big animals (e.g. deer with large antlers and weight). The *utilitarian* or "meat" hunter kills primarily for food.

And finally, there is the *naturalistic* or ("nature") hunter, who hunts to participate directly in nature as a predator. This latter hunter frequently hunts alone.

I have known of a few people who practically never hunted or fished legally. They had good jobs and did not need the meat. For them the excitement of being, on one hand, the predator of the rainbow trout they were spearing, or the deer they were shining, and, on the other hand, prey for the game warden, was irresistible.

So what is wrong with hunting? Lots: The competition among hunters to see who can down the biggest animal, or the one with the largest tusks, antlers, or body weight; the provision for the fencing off of forest lands as hunting preserves on which, for a token fee paid to the state for the ability to hunt animals currently living there. This provides an isolated portion of natural habitat for use by a privileged few paying the requisite fee.

Movements of large mammals, which are legally regarded as public property, are thus prevented from traveling through such "preserves" on their natural migration routes. Apparently no consideration is given to the value of the thousands of animals which would be produced on that land in the future, nor for the interruption of natural migratory routes which have been established over the centuries by the animals.

Furthermore, in Lower Michigan, one can now pay a fee to shoot a "wild" boar in an enclosure. The practice of baiting is essentially training wild animals (primarily deer and bear) to be subservient to the hunter as they feed on some totally unnatural foods for them (pumpkins, sugar beets, etc.). The "hunter" can then sit in a cozily heated blind structure, watching a bait site while also watching TV or listening to a radio (with volume turned down, of course).

But what is right with hunting? Lots: Hunting sharpens

one's senses and increases one's knowledge of the natural world and the role of humans in this world. Killing or eating a bird or mammal taken from its natural habitat is ecologically more reasonable than eating a chicken or pig or cow.

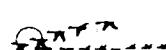
Agricultural practices used to feed cattle and thence a runaway human population have required massive modifications of the environment all over the world, except for cold regions. Our bread comes from wheat grown on land that once supported an abundance of wildlife, but is now managed by the use of herbicides and fertilizers—land from which the natural flora and fauna have been all but eliminated.

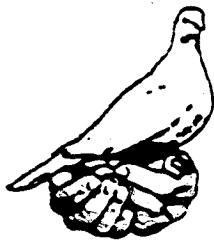
Most hunting represents a harvest of animals from the natural environment in which man acts as one of the predators and, if done right, can sustain a moderate density of people while providing natural habitat for plants and other animals. Hunting, in which the shooting itself occupies less than 1/1000th of one's time, and returns us to our roots. Seeing the bird or mammal that one kills and eats makes one more aware of the role and responsibilities of our own species on the earth.

Dennis Olson, a leading environmental educator and a hunter who lives in Minnesota, described his feelings after reflecting upon killing a deer with bow and arrow. While dressing out the deer, he watched its blood seeping into the ground and envisioned microbes feasting upon it, releasing the elements of the deer that would become elements of plants, and eventually of other animals, just as the flesh of the deer would become part of him.

He further observed: "At the grocery store, the anonymity of the meat counter and the cellophane wrapper insulates me from the reality that an animal died for me. [When I hunt] I know where my meat comes from. I watch it die. This is right."

Food for thought.





WHAT TO DO WHEN YOU FIND INJURED OR ORPHANED WILDLIFE

Friederike G.L. Greuer

Have you ever come across an orphaned baby raccoon, or a turtle with a cracked shell? Did you ever wonder what you could do for them? One option when coming across either orphaned baby animals or injured wildlife is to take them to a wildlife rehabilitation center. There, rehabilitators who are licensed by the state, will treat and then release them.

One such center, Northwoods Wildlife Center, is located in Minocqua, Wisconsin. Veterinarian Dr. Rory Foster first took in injured and orphaned wildlife, and later founded the center in 1979. The main purpose of the center is to work toward a better future for wildlife through rehabilitation, education and research.

Sadly, Dr. Foster succumbed to Lou Gehrig's disease in 1987, but the center is still a busy place, full of furry and feathered patients, many of whom are treated and released. (They have had over 600 patients since the beginning of this year.) Patients which recover but can no longer survive in the wild because of their injuries are often kept by the center, and participate in demonstrations for educational programs.

Volunteers work tirelessly in treating these animals, as well as educating the public about wildlife in general. If you go Minocqua, you can tour the facility on Monday through Saturday from 10 am to 4 pm during the summer months, and between 10 am and 2 pm during the winter.

The center will also present an educational program to any group or organization that is interested, for \$50 per session plus 25 cents/mile.

You can visit the center's web page at www.execpc.com/~nwcenter. The web page also features a list of Wildlife Rescue Guidelines, which you can consult if you should ever come across wildlife in distress. You can also call the center 24 hours a day for assistance at 715/356-7400. The address is:

Northwoods Wildlife Center
8683 Blumstein Rd.
Minocqua, WI 54548

Another rehabilitator whom you can call is Aileen Todd, who has her own center in Republic, Michigan. Her phone number is 906/376-2456, and her address is:

Aileen Todd
Animal Instincts
205 West Fourth
Republic, MI 49879

Either rehabilitator will be happy to answer questions and/or take in injured or orphaned wildlife. Both places are nonprofit organizations, so donations of any kind are always appreciated. The Northwoods Wildlife Center also offers a variety of memberships, and sends out a quarterly newsletter.

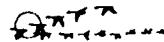
You can learn more about Dr. Rory Foster in two books he wrote, *Dr. Wildlife* and *I Never Met an Animal I Didn't Like*. A later book by Sybil Ferguson, a long-time center volunteer, *Wildlife Hospital*, updates the center's story. All of these books are now out of print, but may be available at your local library, or perhaps through interlibrary loan.

In the Houghton area, we have a dedicated teacher and licensed rehabilitator, Bill Alwin, who can be reached at 906/482-7419. His address is:

William Alwin
404 East Douglass
Houghton, MI 49931

You may also call me, as I am in the process of obtaining a

wildlife rehabilitation permit. My phone number is 906/482-6257 or 906/482-2214, and my address is: Friederike Greuer
218 East St.
Houghton, MI 49931
In a time when humanity seems to be getting more and more self-centered and detached from nature, it is refreshing to find rehabilitation centers run selflessly by volunteers for the benefit of helpless wildlife. Wildlife can be helped in our society, so long as people care.



UPEC September Board Meeting

September 25, at the Ford Forestry Center, Alberta, MI

Items discussed included:

- Bete Grise concerns update
- Michigan Wetlands Action Coalition
- Mercury conference in Marquette (see article)
- MEC statewide issues
- Forestry handbook progress
- WMP report (see article)
- Northern Initiatives request for UPEC project participation
- Future of U.P. state forests
- U.P./Marquette trail issue
- Proposed "habitat park" development in Marquette

EDITORIAL NOTE ON PAPER

Once upon a time, in the not too distant past, a decision was made within this organization to make a firm statement on sound ecological practices by switching to the use of Kenaf Tree-Free paper. This made eminent sense to all concerned, and we subsequently had very good service from our source of this paper, Vision Products in Albuquerque, NM. A goodly number of issues of the newsletter have seen the light of day printed on this stock.

Membership in UPEC is open to all individuals and groups who wish to support the goals of the Coalition. Applications for membership should be sent to P.O. Box 847, Marquette, MI 49855.

UPEC is a nonprofit organization [IRS 501(c)(3)] and dues and contributions are tax deductible to the extent allowed by law.

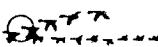
The Upper Peninsula Environment is published four times per year. Articles, press releases, or correspondence intended for the newsletter should be sent to UPEC c/o Newsletter Editor, P.O. Box 673, Houghton, MI 49931.

However, we became aware that the cost of the paper per issue was being inflated through the necessity of our printer to run about 100 extra copies per issue run, just to cover the loss due to the paper being greatly environmentally sensitive to the micro-climate (largely humidity) of the print shop, and jamming in the printing presses and folding machines—for the end product of about 390 copies for a usual standard run.

After research with our printer into possible alternatives, we are with this issue going with a 60-pound recycled paper that is termed "50/30," meaning that it is 50% recycled scrap not printed upon, 30% recycled printed material, and 20% "virgin" (so to speak) paper component. Our printer uses this paper (from a supplier in Wisconsin—read: shipping cost savings) on a regular basis, and does not have the problems with it he has had (uncomplainingly) with the Kenaf.

So we expect to see savings in paper quantity consumed, and costs, as well as frustration on the printing shop floor of the terrific guys at Greenlee Printing.

This is a trial issue with this stock. Reactions to it in the form of feedback will be welcome.



Write Your Reps!

Here are the addresses and phone numbers for state and federal lawmakers that represent the U.P. Let them know what you think about the issues!

Senator Spencer Abraham
United States Senate
Washington, DC 20510
Phone: (202) 224-4822
Fax: (202) 224-8834
E-mail:

michigan@abraham.senate.gov

Senator Carl Levin
United States Senate
Washington, DC 20510
Phone: (202) 224-6221
Fax: (202) 224-1388

E-mail: senator@levin.senate.gov

Representative Bart Stupak
U. S. House of Representatives
Washington, DC 20515
Phone: (202) 225-4735
Fax: (202) 225-4744
E-mail: stupak@hr.house.gov

Both State Senators at:
State Capitol, P.O. Box 30036,
Lansing, MI 48909-7536

State Senator Don Koivisto
(517) 373-7840

State Senator Walter North
(517) 373-2413

All State Reps at:
State Capitol, P.O. Box 30014,
Lansing, MI 48909-7514

State Representative Pat Gagliardi
(517) 373-2629

State Representative David Anthony
(517) 373-0156

State Representative Michael Prusi
(517) 373-0498

State Rep. Paul Tesanovich
(517) 373-0850 or 800-PAUL110

About UPEC . . .

The Upper Peninsula Environmental Coalition was organized on December 6, 1975. The goals of UPEC are to protect and maintain the unique environmental quality of the U.P. of Michigan; to evaluate and promote planning and sound management decisions for all the resources of the U.P.; and to work toward these goals through coordination of member groups, individual members, and public information.

UPEC Board Members:

Bill Malmsten, Ishpeming (President)
485-5909

Jon Saari, Marquette (Vice-President)
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288-3181

Chris Fries, Marquette (Secretary)
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Patti Clancy, Marquette 225-1890

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Doug Welker, Pelkie
338-2680; dwelker@up.net

Newsletter Editor: Holley Linn

Yes! I want to protect the U.P.!

Name _____

Address _____

City/State/Zip _____

Phone _____

I would like to support the goals of UPEC by becoming a member. My annual dues are enclosed (check one):

Regular Member (\$15)

Supporting Member (\$50)

Student/Senior/Low Income (\$10)

Here's an additional contribution of \$_____.

I'd like to ensure the long-term viability of UPEC by contributing \$_____ to the UPEC Endowment Fund.

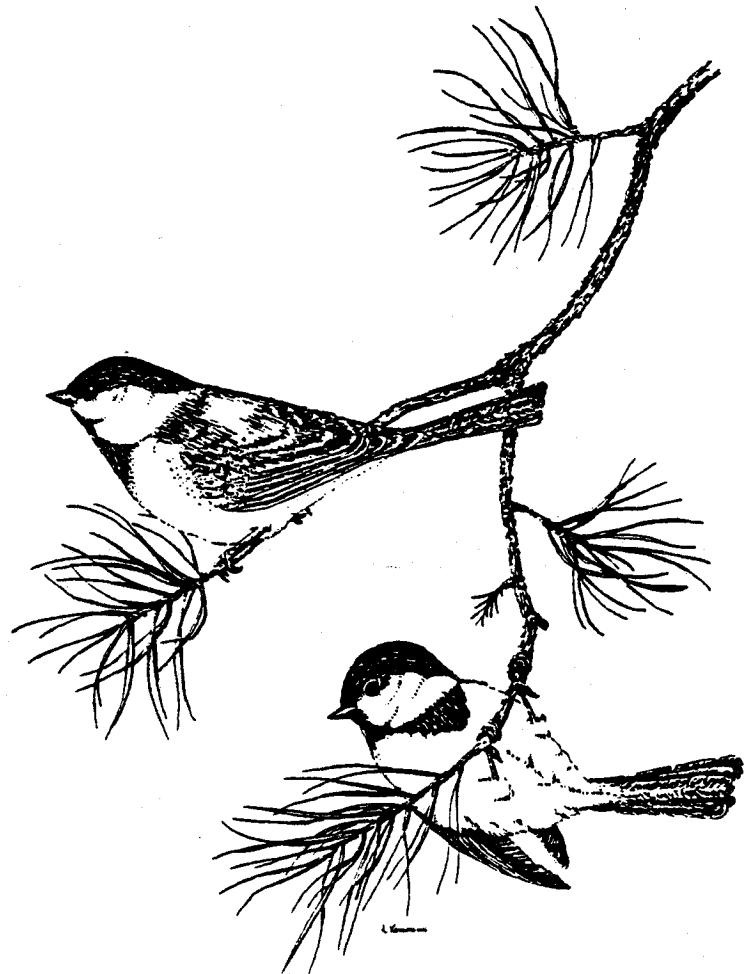
NOTE: If you make the endowment check out to the Marquette Community Foundation (MCF) and put "UPEC Fund" on the memo line, you can take a 50% tax credit on your MI state income tax (up to \$200 for individuals, \$400 for couples). Mail Endowment Fund contributions to MCF, Attn: UPEC Fund, P.O. Box 185, Marquette, MI 49855. Or you can send your contribution directly to UPEC and take a regular tax break. Please send membership dues to UPEC at P.O. Box 847, Marquette, MI 49855.

Thanks for helping to support UPEC!

CALENDAR

January 22, 2000, 3-6 pm –
UPEC board meeting

FYI: UPEC website:
http://members.xoom.com/NC_hiker/upechome.htm



The Upper Peninsula ENVIRONMENT

Upper Peninsula Environmental Coalition

c/o Newsletter Editor

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Houghton, MI 49931

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