

The Pewaukee Lake Study

Preliminary Information from Dr. Robert Anderson's Study

By Howard Lindstedt
(Updated 4/01 by Ron Groeschl)

Dr. Robert Anderson, from Milwaukee Lutheran College, has been working for the past four years in an effort to shed some light on what's going on beneath the surface of Pewaukee Lake, a premier musky lake located in southeastern Wisconsin. This lake is Wisconsin's most heavily used lake and is known for producing trophy muskies as well. Working in joint venture with our Milwaukee Chapter, the Muskellunge Club of Wisconsin, Miller *Friends of the Field*, and the Wisconsin Department of Natural Resources, Wisconsin Lutheran College and the Musky clubs Alliance of Wisconsin, Dr. Anderson has been equipped with the tools and necessary resources to fulfill his quest. He gave the following presentation at the general membership meeting of the Milwaukee Chapter on September 28, 1999, at the Red Carpet Lanes in West Allis, Wisconsin. (Ron Groeschl has updated this as of April 2001)

The Radio Tracking Part of the Study

Dr. Anderson began by stating that the tracking portion of the study is based on radio tracking using advanced telemetry systems equipment made by the finest telemetry equipment manufacturer in the world. Dr. Anderson and his crew are using a radio receiver called the Challenger model 2000. One antenna is a boat-mounted YAGI antenna that measures ten feet high and four feet wide that has a range of two miles. This antenna is needed in the spring and fall before the musky do get to their home ranges. Once we identify their ranges, we know where to find them with the loop antenna, which has a smaller range, but it is easier to handle when close to the fish. Most of the time he utilizes a loop antenna to track the forty muskies that have been equipped with transmitters during the past three years.

During the first year of the project, Dr. Anderson and his staff were able to use a boat and outboard motor that were donated by Tuffy Boats and Mercury Marine respectively. One of our chapter members, Ron Groeschl, donated his personal boat and outboard motor for use by Dr.



Anderson and his staff during the balance of this project. (Do you know anyone who wants to donate a boat to Wisconsin Lutheran College? Call Rong!)

The first 20 fish chosen for this study, ranging in size from 32" up to 43½" were caught in Department of Natural Resources fyke nets and via electro-shocking. Smokey's West Bait Shop, on Pewaukee Lake, donated some space that Dr. Anderson used for a laboratory.

Internal transmitters were implanted in the first 20 fish. The muskies were transported to the laboratory at Smokey's Bait Shop where the actual surgery was conducted. The transmitter was

inserted into the front “shielded needle inserted into the threaded through and opening. This was a 3½- are experienced in this became very experienced then released back into shop *and all returned to captured!*



portion of the abdomen. Using a procedure, the antenna was abdominal cavity of the fish, allowed to exit near the anal minute procedure for those who technique, and Dr. Anderson soon in this technique! The fish were Pewaukee Lake in front of the bait *the area where they were*

After the initial 20 internal transmitters, the balance have been externally mounted. Jason Smith, a Club member, and a heck of a musky guide, who also has a degree in fisheries management mounted these. External mounting allows us more flexibility in targeting certain fish. Example would be in 2000, we target fish that were caught on the northern edge of the western lake basin. The reason being that we wanted additional data on fish that frequented that lake basin so that it could be reviewed with the information found out about the fish from the eastern basin of the lake.



In both instances, the antenna, which remains outside of the fish, emits a pulse code that can be tracked. On the external mounts, two wires are used to attach the transmitters to the muscle below the dorsal fin of the muskies. This mount can be done in the livewell of the boat that captured them. It is especially nice that the new Tuffy

boats have 60-inch livewells.

Prior to release, statistical information was documented from each of the fish, e.g., length, weight, girth, sex, etc. Other fish, 400 of them up to 49” in length, have been caught and tagged. Information data was also collected on these fish in order to broaden the database of knowledge concerning fish in Pewaukee Lake.

Each transmitter operates on a different frequency on the AM Band (you can track with a standard radio set to the AM stations). Not all transmitters are on every day. By changing the activation cycle, we can track the fish longer and gain a better understanding of their movements. The frequency numbers are entered into the computerized locator and it scans for all of the frequencies entered. What is heard is a series of “beeps” that originates from the pulse code from each antenna. The fish are then located and their position was documented on a map by use of a Global Positioning Sensor (GPS). Each location was recorded onto a form which included the date and time, water temperature, water clarity, weed in the area, and a computerized analysis of the water including ph levels, dissolved oxygen etc. This database is then matched with information from the National Weather Services to allow further analysis of weather effect on the fish.

Fish were tracked during 1998, 1999, and 2000 and will continue in 2001. This information about their positions has been digitized and allows the creation of maps. The initial series of plot patterns (with information from 1998 & 1999) indicated a heavy concentration of fish movement throughout Taylor Bay (north central part of the lake) and the area to the east of the bay, along with broad areas in the southwest and northwest corners of the lake. We have now started to analyze the additional information from those fish that had transmitters attached to them in 2000. This group

of fish was targeted to come from the main body of the lake; hopefully we can correlate these fish ranges and activities with those from the eastern, shallower, part of the lake.

Observations

Home Range and Fish Movements

Dr. Anderson found that the tracked muskies had definite home ranges in the area of 15-50 acres in size. He also observed that there was plenty of overlap between the home ranges of different fish. Dr. Anderson concluded from these observations that muskies share their home range, they don't defend any particular home range, and they are not territorial.



Dr. Anderson showed the daily plot track of particular fish. He found that on some days they moved quite a bit within their home range, but on other days they hardly moved at all. He has begun to analyze or compare these movements or lack of movements with weather conditions that existed at the time. He also observed that some fish had a separate spring and summer home range, while other fish only had one home range. He mentioned that this might explain why a fish that you originally encounter in the spring of the year suddenly and inexplicably disappears. It is obvious that the female musky have larger home ranges than the male. Is it that internal quest for the sale at the Mall? Sorry ladies.

He also noticed observed what appeared to be a trend towards moving into deeper water from spring on into summer (including September). During October, the fish tended to spread out more. He further added that he had great difficulty locating fish that were deeper than 15' from the surface. He believed that the fish stayed high in the water column but then sank down into the water column as his boat passed by. This type of activity was witnessed when a fish that had just had it's location and other information recorded was pointed out to a nearby boat of musky fisherman. They were asked to cast at the fish, which was about 30 feet in front of the study boat. The fish just sank down until it was laying in the muck, on it's transmitter antenna. The beeping stopped until the fishermen left the area, the musky then rose of off the bottom and it's transmission could be heard again, getting stronger and stronger as it rose in the water column at the initial location that it was spotted in. It did not move from its original location during the casting efforts of the fishermen.

Stomach Contents Study

The stomach contents of 85 muskies were studied during the spring of 1998. The results of this survey indicated that they fish existed on the following diet:

Food Item	Number	%
Yellow Perch	6	17.1
Walleye	1	2.9
Unidentified Percidae	2	5.7
Largemouth Bass	5	14.3
Green Sunfish	1	2.9
Sunfish (Bluegill or Crappie)	1	2.9
Unidentified Centrarchidae	1	2.9

Yellow Bullhead	1	2.9
Unidentified	17	48.6
85 Muskies Sampled	32 Yielded	Specimens

These numbers agree with other studies done in the last few years. Of interest is that about 60-70% of the time, their stomachs are empty. If we only could figure out what makes them want to 'get the feed on! What does a 50-inch musky eat? One that was harvested from Pewaukee was found to have a 30-inch musky in it's stomach. (That might add some value to the concept of "Big Bait for Big Fish")

Plant Life Study

A portion of his study also concerned plant life (plant survey) in Pewaukee Lake. He observed that coontail, muskgrass, big leaf pond weed, bushy pond weed, and other types of plant life, exist in this lake. A paper on the health of the weed population in the lake was given by one of the project members from WLC, Michelle Thomas to the Wisconsin Academy of Scientific Arts and Letters towards satisfying her masters degree requirements. For the past three years, additional classes of students from the Biology Classes at Wisconsin Lutheran College have continued with this important study of the fish habitat.

Other Findings

Dr. Anderson was unable to locate any evidence that would substantiate a belief that natural reproduction of muskies occurs in Pewaukee Lake. Note club members and DNR did identify a few small muskies that did not fit our stocking sizes. They may have been from the standard DNR planting of musky fry every year. This was not enough to signify that there is real natural reproduction, but further studies are continuing. In 2000 we placed 20 wire nets in areas that spawning has occurred in. We were not successful in capturing any eggs for analysis, and have remodeled the nets for the 2001 season. We did notice that during the spawning period, herds of carp did work the spawning site, and you can be sure that they do a considerable amount of damage to any eggs that had been laid. Shall we organize a Carp Shoot?

Future Considerations

Wisconsin Lutheran College has been a very fantastic partner in this project. In addition to Dr. Anderson's time, and the fact that he has made this project part of his curriculum for his students, is the college's commitment of resources. The school has provided the computerized water sampling equipment, a bottom-sampling device to gather specimens to determine fertility, and have even given Dr. Anderson a 6-month sabbatical to work on the project full time from January 2000 thru the beginning of the school year in August 2000.

This information on the tracking, was presented at the 1999 American Fisheries Society Esocid Technical meeting in LaCrosse, Wisconsin, where it received quite a bit of interest. After this initial presentation about the project, it has been on the agenda each year since. Dr. Anderson and Sue Byler of the WI DNR have given additional presentations on the study to audiences at the Midwest Fish and Wildlife Conference in Minneapolis, which was attended by over 1800 biologists and students.

Dr. Anderson has also been acting as consultant to the DNR in Wisconsin, Illinois, and Indiana of tracking studies, including musky and walleye. This shows the respect that our study is receiving from those who can make a difference in the fisheries for the future.

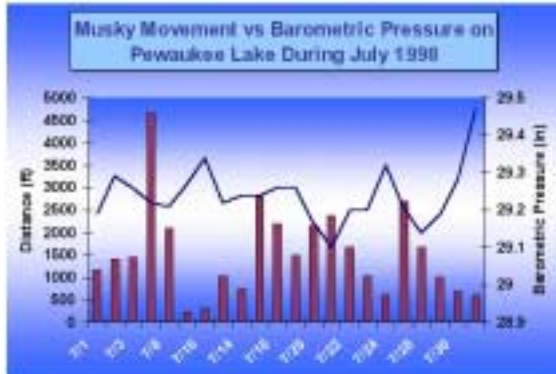
This project has become part of the Biology Classes projects at Wisconsin Lutheran College. Each year for the past 3 years and into 2001, the class studies 3 or 4 areas that describe the health of the lake. Not only is this a leading edge in education, the moving away from the lecture presentation to a total project teaching methodology, but it has also resulted in additional grants from Miller Friends of the Field to research the water quality issues. One of the original team from the college has landed a job with the DNR and his contributions with the Study have been a factor in his selection.

What if You Catch a Tagged or Transmitter Fish?

Dr. Anderson explained that there are many tagged muskies in Pewaukee Lake at this time, and the chances are good that one of them may be caught again. One was caught in Tichigan Lake! (We are researching what can be done to the dam to prohibit them from leaving Pewaukee via the river.) By the way, one musky has already been caught (and released) 5 times. In the event you catch a tagged fish, (there were 400 of them) Dr. Anderson suggested that you document the length and girth of the fish and the tag number. The tags are now getting hard to read as they may be covered with a scab tissue. If you keep the fish, also document the weight of the fish and examine the stomach contents if you so desire. He also requested that the transmitter be returned to him.

Closing

Additional areas of the study include topics such as 'different water quality issues', 'weed content in the lake', 'effects of weather on the fish', and many other items to observe, review and discuss.



Further information will be presented as we continue on this fantastic project. Dr. Anderson is working on completion of two papers to be published on the musky home range information that has been captured. Additional work has been done by students on the Master degree thesis, and more work will be done by students who are enrolled in the Biology classes at Wisconsin Lutheran College.

Our web site www.Milwaukee-Muskies-Inc.Org will be initiated during March 2001. It will be launched with just about 5-8% of the information that is available, but will continue to be updated with interesting things about the study, but also about the club's background, fishing contests and other items to acknowledge the fact that,

We Are Milwaukee Muskies Inc. We care.

If you know of an organization that would be interested in a presentation about the study, contact Ron Groeschl. Home = (262) 789-1255. He has spoken to at least 30 different groups and has a computerized presentation that is updated monthly and is then projected onto a screen. He has spoken to Musky Clubs, Rotary Meetings, Walleye clubs, Bass Clubs, Schools (environmental classes) and he has been awarded the 2000 Bob James Award from the Musky clubs Alliance of Wisconsin, and the Eagle River Chamber of Commerce.

All of this happened because of your support. **THANK YOU**