

technology is further developed and they believe that the Great Lakes Science Center vessels will be the ideal platforms from which to deploy this new technology. Challenges and opportunities for the Great Lakes Science Center vessel program for the GRAYLING in the next 20 years includes increasing vessel staffing with the addition of a mate and filling two biologist positions to bring the scientific staffing up to three biologists.

VESSEL FITNESS AND FUTURE: The GRAYLING is a safe cost-effective work platform, which has had few maintenance problems until recent years. It was considered to be the best of the five USGS vessels prior to acquisition of the KIYI. The GRAYLING is expected to last at least another 20-25 years. There are currently no plans to replace the GRAYLING. Adding 10 ft. to the hull at the stern of the vessel would increase stability and add working space on deck.

VESSEL PROGRAM SUMMARY

VESSEL NAME: SISCOWET
OPERATOR: U.S. Geological Survey, Great Lakes Science Center
 Ann Arbor, Michigan
LAKE: Michigan
HOME PORT: Cheboygan, MI
CAPTAIN: Thomas Girard
CHIEF OF VESSEL MANAGEMENT: Robert Nester
SCIENCE CENTER ADMINISTRATOR: Dr. Nancy Milton, Director

PROGRAM DESCRIPTION: Prior to the recent delivery of the KIYI in 2000, the SISCOWET served as the principal research platform for the U.S. Geological Survey (USGS), Great Lakes Science Center studies on Lake Superior. In late 1999, the SISCOWET was re-assigned to Lake Michigan to temporarily replace some of the research activities conducted by the Cisco that was decommissioned in the same year. The SISCOWET was used in fall 1999, all 2000, and will be used in 2001 principally for lake trout population assessment in Lake Michigan. This vessel will support science and survey needs on Lake Michigan until the complete refurbishment and delivery of a replacement



research vessel, the Sturgeon (anticipated in mid- to late 2002). Months of operation span from late April to mid November; in 2001 a total of 75 operation days are planned on Lake Michigan. Nearly 100% of the work done by the SISCOWET in Lake Michigan is fish population assessment. All work done by the SISCOWET is in cooperation with partner state, tribal, and federal resource agencies on Lake Michigan, coordinated through the Great Lakes Fishery Commission and the Lake Michigan Technical committees. Although other agencies are not directly involved in the sampling, data collected by the SISCOWET and resultant analyses are shared with these partner agencies for joint management of the fish populations. The SISCOWET does not do contract work for other agencies and no Great Lakes Science Center core program work on Lake Michigan is contracted out to other agencies or entities. The SISCOWET has been used for joint surveys partly underwritten by tribal fishery management authorities (2000) and US Fish and Wildlife Service (2001) on Lake Michigan. In addition, the SISCOWET was also used for an extended period on Lake Erie in 2000 due to a breakdown of the MUSKY II.

VESSEL DESCRIPTION: The SISCOWET is a Great Lakes gill net tug design that was built by Burger Boat of Manitowoc, WI in 1946. It was acquired by the Great Lakes Science Center, Lake Superior Biological Station at Ashland, WI in 1949. The SISCOWET was modified for trawling in 1957. It is a steel-hulled boat, 57 feet long, a beam of 14.5 feet, a navigational draft of 6 feet 4 inches, and a displacement of 42.7 tons. It has an unknown amount of iron ballast in the lazarette. The SISCOWET has a fuel capacity of 1,250 gallons, a potable water capacity of 500 gallons, and two sewage-holding tanks with a total capacity of 106 gallons. It has 450-ft² exterior workspace on the aft deck, a 140-ft² interior wet lab in the bow, and a 12-ft² storeroom in the bow forepeak. The SISCOWET has berthing to accommodate five people: one bunk for the captain in the pilothouse and four bunks in a stateroom. It has a galley with stove, microwave, refrigerator/freezer, and a table with seating for 5. Recreational facilities include a TV and VCR. The SISCOWET is powered by a Detroit 671 diesel engine with 8.4 knots as the cruising and top speeds. It has two diesel generators, a 73 hp 30 kw Detroit 3-53 and a 27 hp 20 kw Yanmar 27, a Quincy 120 psi 30-gallon air compressor, and a Weil McLain 68 V oil boiler. Deck machinery includes a custom-made anchor windlass, a Bruco Apr H2m winch with 1,500 feet of 3/8th-inch cable, a Hoist/BOS/NS N/E6 winch with 1,000 feet of 1/8th-inch cable, and a KEM gill net reel. Pilothouse electronics include a Raytheon 1210 XX radar salvaged from the Cisco and installed in 2000 and a Pathfinder SL70 backup radar installed in 1999, two depth sounders (Raytheon V850 and Furuno FCU-582), a Raytheon RayStan 920 GPS installed in 1994, a Northstar 951 X DGPS and Raytheon 900 series GPS (not functioning due to lack of Y2K upgrade), two marine radios (Motorola Triton 2 salvaged off the CISCO and a ICOM IC-M127 installed in 1997),

and a Motorola cell phone acquired in 1995, a M500 Wood Freeman Auto Pilot, a Raytheon Loudhailer 430 salvaged from the CISCO, and an Alert AR100 man-over-board alarm system.

VESSEL STAFFING: The SISCOWET, while assigned for use in Lake Superior, was crewed by a boat captain whose official Wage-Board Series classification was a Ship Operator, an engineer whose official classification was a Marine Machinery Repairer, and a Cook/Seaman. Since the re-assignment on Lake Michigan, the vessel has been crewed only by a captain and an engineer. The boat captain is required to have a Coast Guard Masters License for tonnage equal to or exceeding that of the vessel, which for the SISCOWET would be a 50-ton license, and acceptable knowledge, skills, and abilities relating to the position. The boat captain is responsible for operational readiness of the vessel, navigation, routine maintenance, and safety. The captain assists the chief biologist on board in planning daily work schedules. The engineer is not required to be licensed, but must be skilled in the operation, maintenance, and repair of the vessel's engines, machinery, fishing equipment, and all systems such as electrical, heating, plumbing, and hydraulic. As of 2000, pay ranges were \$23.90-\$27.93 for Ship Operator, \$18.73-\$21.87 for Marine Machinery Repairer. At least one biologist and one or more technicians provide scientific staffing for all SISCOWET operations. Scientific staff is responsible for developing daily work schedules and coordination of the collection of data necessary to meet research objectives. The SISCOWET crew operates fishing and other data collection gear and rarely assists the scientists in sampling fish catches. The scientific staff assists the vessel crew with some deckhand duties and other aspects of vessel operation. The SISCOWET crew spends about 5% of its time on non-vessel work. This work generally consists of maintenance, housekeeping, and security of the Great Lakes Science Center's vessel base facilities at Cheboygan, MI.

VESSEL OPERATION AND MAINTENANCE COSTS: The SISCOWET operated 25 days in Lake Michigan and 60 days in Lake Erie in 2000. The vessel is projected to operate 75 days in Lake Michigan in 2001. Fuel use is 12.5 gal/hour. The SISCOWET is hauled out, inspected every 3-5 years and, if necessary, sandblasted and painted. The last haul-out was in 1997, sandblasting and painting was done in 1993, and the vessel was painted above the water line in 2001. The last engine overhaul was in 1994 and there are 1,750 hours on the engine since that overhaul. The boat captain and engineer work with the Chief of Vessel Management to schedule and complete maintenance projects. The operation and maintenance budget for the SISCOWET has not changed in recent years, but has been adequate to maintain required vessel operation. The frequency of unforeseen repairs has not increased in recent years and they have not resulted in cancellation of an assessment cruise. The crew of the SISCOWET does most of the maintenance, the exceptions being haul out and sandblasting. There is good access to parts suppliers and repair facilities at the Cheboygan vessel base and at certain ports on Lake Michigan. Great Lakes Science Center support for maintenance of the SISCOWET has been just adequate to address repairs and safety concerns necessary to keep the boat operational – this strategy was prudent given the age of the vessel and its impending replacement. However, many of the systems are in need of replacement if longer service is desired. Problems with watertight integrity still plague the vessel and the hull, machinery and electrical systems need to be reevaluated since they have been maintained marginally. The aging electrical system represents a high potential for continuous failure and electric shock.

VESSEL INSPECTIONS, AND SAFETY: The SISCOWET was given a condition assessment inspection by the Great Lakes Science Center Chief of Vessel Management. The last formal inspection by a marine surveyor was in 1998 [Jamestown Marine Services, Inc.]. The SISCOWET received a hull ultrasound (audio gauging) in 1997. A stability test was done in 1958 but those stability calculations do not reflect current weights and loading. The crew receives annual CPR training and first aid training every 3 years. The crew received fire-fighting training in 1995. Safety equipment on the SISCOWET includes a 12-foot aluminum boat with a 6-hp outboard engine, one 10-man life rafts, 8 exposure (survival) suits, 4 life jackets, 2 life rings, and 8 water lights. Fire fighting equipment includes a fixed CO2 system in the engine room, 6 hand-held fire extinguishers, and one fire pump/deck wash system. A dedicated sea chest was fabricated and installed in 2001 for service to the main engine to remedy the water competition problem to allow sufficient flow to fire pump while under way. The pilothouse console was reconfigured for better visual access to instrumentation in 2000.

FUTURE VESSEL PROGRAM: Support for the program has been marginally sufficient to maintain the SISCOWET in a safe operational mode and to complete the minimum required science program objectives. The

Great Lakes Science Center is developing new safety and budget strategies that will help better meet the needs of the Great Lakes vessel program. These strategies include classifying vessels as “facilities” and preparing comprehensive vessel management plans that incorporate up to 5-year preventive maintenance schedules based on regular condition assessments by the Vessel Manager and marine surveyors. Great Lakes Science Center personnel believe that their current core programs of prey fish, lake trout, and fish habitat assessment will be ongoing during the next 20 years but that the sampling technology will likely change. They expect more assessment to be done by remote sensing as current technology is refined and new technology is developed. The Great Lakes Science Center has acquired and is retrofitting a much larger vessel, the STURGEON, to replace the SISCOWET on Lake Michigan. The STURGEON will be much more capable of carrying out the Center’s Lake Michigan program than either the SISCOWET or former CISCO. However, this new vessel will be more expensive to operate both in terms of daily operations and number of crew needed for operations and will require appropriate increased agency support.

VESSEL FITNESS AND FUTURE: The SISCOWET was a good low-maintenance work platform that worked well in Lake Superior, especially early on when gill nets were used more for assessments. However, it is an old vessel, has needed hull work in recent years, and its gill-netter design is not the best for the current and future USGS core program in Lake Michigan, which emphasizes trawling and remote sensing to accomplish assessment of fish populations and fish habitat. As indicated above, the SISCOWET will be replaced by a larger vessel by 2002. The STURGEON is over 100 feet long and will facilitate trawling and remote sensing better than the SISCOWET. The SISCOWET may be used to replace the MUSKY II in Lake Erie.

VESSEL PROGRAM SUMMARY

VESSEL NAME: STEELHEAD
OPERATOR: Michigan Department of Natural Resources, Charlevoix Fisheries Research Station, Charlevoix, Michigan
LAKE: Michigan
HOME PORT: Charlevoix, MI
CAPTAIN: Jerry Meggison
STATION ADMINISTRATOR: Dave Clapp



STATION PROGRAM DESCRIPTION: The Steelhead is used primarily to assess populations of yellow perch, lake trout, and non-native trout and salmon (chinook and coho salmon, rainbow trout, brown trout) in Michigan waters of Lake Michigan. The vessel typically makes two cruises of the shoreline each year. Sampling begins in April with the start-up date dependent on ice conditions. During the first trip south, bottom-set gill-net assessments of yellow perch and lake trout are conducted at various sites. In mid-May, a lake-wide assessment of chinook salmon and other trout and salmon begins in the south end of the lake and finishes in the north by the end of June. These fish are sampled with large suspended gill nets fished near the surface and at the thermocline. The crew takes some time off in early July then goes back to the south end of the lake and repeats the lake-wide assessment during July to early September. The Steelhead is used from September into early December for forage-fish assessment using hydro-acoustics in cooperation with the U.S. Geological Survey, Great Lakes Science Center (2 weeks), lake trout spawning habitat studies involving egg incubation in containers and Astroturf (2 weeks), for lake trout recruitment evaluations using trawls, and for fall lake trout assessment on spawning reefs using gill nets. The Steelhead has operated an average of 140 days during the past three seasons with 85% being gill-net assessments and the remainder being hydro-acoustic and spawning habitat studies. Ten years ago the assessments were 50% with gill nets and 50% with trawls. Work not involving the Steelhead conducted from the Charlevoix Fisheries Research Station includes operation of the statewide Great Lakes creel survey and charter boat monitoring program, collection of biological data from state-licensed commercial fish catches, assessment of fish populations in near-shore waters by trawling with a small boat, and recovery and reading of coded-wire tags from trout and salmon heads collected from Lake Michigan and Lake Huron. The Steelhead has not done contract work and any contract money earned would not go back to the station's programs. The Charlevoix Fisheries Research Station currently does not contract out any vessel program work.

VESSEL DESCRIPTION: The Steelhead was designed by Korkut Engineer, Inc. of Metairie, LA and built in 1967 by T. D. Vinette of Escanaba, Michigan for the Charlevoix Fisheries Research Station. The Steelhead has a 3/16th-inch steel hull and aluminum pilothouse, is 62.5 feet long, and has a beam of 16 feet 4 inches, a 70-ton displacement, and a draft of 6.5 feet. Workspace (feet²) on the Steelhead includes a forward deck (140), aft deck (340), and wet lab (90). The Steelhead also has a galley area (130) with 4 bunks and one commode. The vessel is powered by two 380 hp Cummings diesel engines (NT380) and cruises at 2,000 rpms and 11.3 knots. A governor on the engines is set at a maximum of 2,350 rpms. The Steelhead has an Onan 15kw generator (3A1.7-G), and several pieces of hydraulic powered deck equipment including two Bevco Model 1320 trawl winches (Apex Equipment, Inc., Seattle, WA) with a capacity of 2,000 feet of 3/8th-inch cable, a Crossley 30-inch gill net lifter, a crane with a 1-ton lifting capacity, a Gearmatic Model 7-M trawl drum (Apex Equipment, Inc., Seattle, WA), a capstan of unknown make, and a Marco Power Block. Pilothouse electronics include a Neco 8401 autopilot installed in 1985, two Raytheon 20XX radar units installed in 1992 and 1997, two GPS units (Northstar 9400 in 1997, Furuno GP-31 in 2000), a Furuno LC-90 loran installed in 1992, two depth sounders (Datamarine Dital 2700, Raytheon V-800) installed in 1985 or 1986, an EYM Simrad sounder, two marine radios (Polaris RDF 2-watt, Icom hand-held 1C-M15), Danforth White Compass, Datamarine Chartlink II, and a Simrad CM35 trawl monitor.

VESSEL STAFFING: The current crew of the Steelhead consists of a boat captain, an assistant boat captain, a fisheries technician, and a fisheries assistant. All are full-time positions except the fisheries assistant, which is a 10-month position. The boat captain has worked for the state for 32 years, started out as a boat aide, has boat experience since 1969, and has been the boat captain since 1992. The assistant boat captain and technician are former commercial fishermen and both have been in their positions on the Steelhead since 1992. The fisheries assistant has worked on the boat since 1986. The crew of the Steelhead 20 years ago was also four people but they were all full-time. The boat captain and assistant boat captain are required to have a Coast Guard 100-ton Masters License to operate the Steelhead. The technician and fisheries assistant also have 100-ton licenses but these licenses are not required for their positions. A biologist is present on the Steelhead only about 15% of the time, usually for special projects such as yellow perch or hydro-acoustics. The crew receives annual safety training and is eligible to receive other training available to all state employees such as computer training. Work related training is on-the-job but little is necessary due the tremendous experience of the current crew. The crew spends about 5% of their time on non-vessel related projects such as station maintenance, coded-wire tag removal, and tetracycline studies.

VESSEL OPERATION AND MAINTENANCE COSTS: The Steelhead operated an average of 140 days annually during 1998-2000. Steelhead main engine hours averaged 419 for 1998-2000. Fuel use during 1998-2000 averaged 7,100 gallons and ranged from 6,000 in 2000 to 8,000 in 1999. Average annual fuel cost was about \$8,000 during 1998-2000. Fuel use and cost per engine hour for the Steelhead averaged 17 gallons and \$19, respectively, and per vessel day was 51 gallons and \$57 per day. Operation and maintenance costs other than fuel (dockage, insurance, maintenance-repairs-equipment, utilities, haul-out) averaged \$16,390 per year or \$117 per vessel day. Crew costs (wages, overtime, travel expenses) were \$169,070 or \$1,208 per vessel day. Total cost for operating the Steelhead from the above figures would be about \$193,460 or \$1,382 per vessel operating day. Other expenses that were not but possibly could be added to the above include net material and net construction supplies (\$5,000 annually) and fish disposal (\$1,400 annually). The above maintenance costs are "normal" and do not reflect special maintenance years such as 2000 when about \$30,000 was required to replace engine drive shafts, replace sections of hull, and sandblast and paint the hull. The Steelhead is hauled out, sandblasted, and painted every 4-5 years. Engine tune-ups and overhauls are done as needed. The Steelhead is wet-docked during the non-operational season, heated with an oil furnace, and bubblers are used to prevent ice damage. The boat captain works with the station supervisor in planning maintenance projects, and they have recently developed a maintenance schedule spreadsheet. The boat captain is responsible for completing maintenance projects and the station administrator is responsible for providing budget support and project oversight. The frequency of unforeseen repairs has not increased in recent years and has caused at most 1-2 days lost per operation season. The Steelhead carries a supply of spare parts and the crew handles most scheduled and unforeseen minor repairs and maintenance. For major engine repairs, a mechanic can usually be obtained in a day. Brecheisen Diesel of Gaylord, Michigan services the Steelhead engines. The Steelhead operation and maintenance budget over the past 10 years went down, then leveled off, and then has increased in recent years. The Charlevoix station usually gets all of the operation money they request but not all the requested equipment and maintenance funds. This hasn't constrained their program yet but they have postponed scheduled maintenance in some years.

VESSEL INSPECTIONS and SAFETY: A marine surveyor completed Condition and Value surveys in 1995 and 2001. The 1995 survey found seven problems and recommended corrective maintenance. A hull ultrasound was done in 2000 resulting in replacement of several deteriorating hull plates. The previous hull ultrasound was in 1990. Although a stability test may have been done when the boat was launched in 1967, knowledge of this test was not available and no test has been done since MIDNR took ownership. Modifications done since 1967 that would influence stability include addition of deck gear (crane, net drum) and replacement of built-in fuel tanks with independent tanks positioned lower below decks. The crew receives CPR training annually and First-Aid training every three years. Man-overboard training is done annually off the boat. A safety-training program is being developed. Safety equipment onboard the Steelhead includes a 13-foot Boston Whaler boat, a Solas 6-man inflatable life raft, one Alden Satfind 406 S-1010 EPIRB, two Type IV life rings, twelve Type I life jackets (10 adult, 2 child), and five Sterns survival suits. Fire suppression and warning equipment includes a Ansul Halon 1301 system in the engine room, seven hand-held CO2 extinguishers stationed in various parts of the vessel,

numerous smoke alarms, and alarm bells for pressure and heat in the engine room. The crew knows how to use the extinguishers and the boat captain has been with the Charlevoix fire department for 31 years. The Steelhead has two bilge pumps, one electric for wash down and bilge and one powered off the starboard engine.

FUTURE VESSEL PROGRAM: The Charlevoix Fisheries Research Station administrator and boat captain believes that the station will have a vessel program 20 years from now, and that support for the Charlevoix station's vessel program is good to excellent within the Research Section and Fisheries Division. The vessel program will be necessary to collect data mandated in the recently negotiated 2000 Consent Decree pertaining to that part of Lake Michigan covered by the 1836 treaty with Native American tribes. The Charlevoix station staff feels that the recent reorganization of Fisheries Division into lake basin teams will increase understanding of the role of MIDNR Great Lakes vessels and increase support for vessel programs among Fisheries Division personnel. Staff believes that certain components of the station's vessel program such as lake trout and chinook salmon assessment and the current months of operation are unlikely to change, but some current work may be scaled back in order to do more work on habitat and other species. The Steelhead operates at or near the maximum number of days available, given weather conditions. Although the vessel and vessel staff may be capable of collecting somewhat more data, the total amount of work done is not likely to increase in the foreseeable future because the station would need more scientific/technical staff to process the data. The current vessel staff is judged to be adequate and almost ideal but the Charlevoix Fisheries Research Station would like to have the 10-month fisheries assistant position changed to a full-time position. This would make the position more desirable and decrease the threat of turnover in this position where experience is important and based on on-the-job training.

VESSEL FITNESS AND FUTURE: The Charlevoix Fisheries Research Station staff believes that the Steelhead is meeting their current program needs and will meet their future program needs, that it will last at least 20 years, and consequently it is not being considered for replacement. The Steelhead is a multipurpose vessel that can do gill netting, trawling, serve as a dive platform, and work with high-tech gear such as ROV's and hydro-acoustics. The Steelhead is a dependable work platform, operating 140 days per season with a minimum of time lost due to repairs. The gill-net lifter is located in a space that is below the main deck but in an optimal forward position for lifting conventional gill nets. Nets and fish are raised by a hydraulic platform or manually to the main deck above for stowage and data collection. The Steelhead's draft prohibits working in some shallow bays but shallow-water work has not been an essential part of the Steelhead's program and this work has been accomplished in recent years using a 20-foot boat. The captain feels the Steelhead could be five feet longer for better handling and more work-deck space.

VESSEL PROGRAM SUMMARY

VESSEL NAME: O. MYKISS
OPERATOR: Indiana Department of Natural Resources
LAKE: Michigan
HOME PORT: Michigan City, Indiana
CAPTAIN: Vacant
STATION ADMINISTRATOR: Brian Breidert



PROGRAM DESCRIPTION: The Indiana Department of Natural Resources (INDNR) O. MYKISS vessel program on Lake Michigan runs from late April to early November with gill nets, a small bottom trawl, and a neuston push net used to assess fish populations twice weekly during April-July and four times during late October-early November. Approximately 70 % of the vessel time is spent setting and pulling gill nets for the Lake wide predator assessment project during the spring and fall. Lake trout, burbot, and chinook salmon are the target species. The remaining 30% is spent on trawling and neuston netting for young of the year and larval yellow perch, respectively. Ninety percent of the work done by the O. MYKISS is fisheries assessment for INDNR and 10% is supportive work for other Great Lakes agency projects. The Michigan City station also uses smaller boats to do electro-fishing and collection of fish for contaminant analysis. The O. MYKISS has not been contracted out for work by other agencies, nor has INDNR seriously consider contracting out the work currently being done by the O. MYKISS.

VESSEL DESCRIPTION: The O. MYKISS is a 36-foot aluminum boat designed and built in 1988 by Sea Ark Marine in Monticello, Arkansas. It was acquired by the INDNR in 1988. The O. MYKISS has a beam of 11.5 feet, a draft of 3 feet, and total weight of 20,000 pounds. Workspace is about 80 ft² forward and 200 ft² aft. The vessel has 2 bunks but does have a commode and potable water supply. The O. MYKISS is powered by two 375 hp Caterpillar diesel engines (Model 3208TA) that were installed in 1988. The top cruising speed for the vessel is approximately 35 knots on flat days. Each engine has a little over 1,400 total hours with less than 200 hours since the last overhaul. Auxiliary electrical power is provided by a Westerbeke 6 kw generator. Deck machinery of a Kolstrand winch and a Crossley 20-inch gill net lifter (being added 2001). The O. MYKISS has a Furuno Model 1800, type RPD-043 class B radar, a SiTex Nav ADD 8000 MKII GPS, a Lowrance X-16 sonar (paper graph) and a Signet MK272 depth sounder, an ICOM IC-M100 marine radio, a Danforth Constellation express compass, a Loran Receiver type 787 SiTex Koden, and Motorola radio with INDNR frequencies.

VESSEL STAFFING: The biologist in charge of the Michigan City station is responsible for the O. MYKISS operation and staffing budgets. The budgets are submitted to the INDNR office in Indianapolis for approval. The biologist also supervises the dedicated crew. The dedicated crew of the O. MYKISS consists of a boat operator, a deckhand, and a seasonal worker. The boat operator supervises the deckhand and the seasonal worker. This has been the crew composition and line of supervision since the O. MYKISS was acquired. Scientific staffing on the vessel is two biologists who must function as part of the crew during fisheries assessments. A boat operator is in the process of being hired this year. The person being hired to fill the position has limited years of experience on the O. MYKISS as well as on the Great Lakes and will require training. The deckhand has 2 years experience on the O. MYKISS, which is that person's experience on the Great Lakes. The Michigan City station has undergone some reclassification changes of the boat operator position in recent years. The boat operator position was once classified as a boat captain position but in 1999 was reclassified as an Operator/Property Manager, which is a professional position that requires a college degree, and pays \$22,000-\$30,000 annually. A Coast Guard Masters license was required for the boat operator when the position was classified as a boat captain but this requirement was dropped when the position was reclassified to Operator/Property Manager. This position recently became vacant when the incumbent was promoted to a biologist position at the Michigan City station. The position will be filled following normal INDNR hiring practices and will take at least three months to fill. Refilling of the position

will be completed by May 1st of 2001. The deckhand is classified as a Labor and Maintenance Technician, a non-professional position that does not require a degree, and pays \$17,000-\$22,000 annually. It is currently under review for reclassification. The crew can earn compensatory time off but no paid overtime. Prior approval for compensatory time off must be obtained from the INDNR human resources director. The current classifications of O. MYKISS crew positions provide a career ladder where the boat operator can be promoted to biologist and the deckhand can with additional training move up into the boat operator position. The INDNR provides boater safety training for the crew. Training on vessel operations and safety are conducted at the beginning of each field season. Some members of the crew have attended first aid and CPR training as well. The crew of the O. MYKISS spends 75% of its time on non-vessel related projects such as construction, vehicle maintenance, lab work, and sport fish monitoring.

VESSEL OPERATION AND MAINTENANCE COSTS: The O. MYKISS operated an average of 28 days and engine hours averaged 78 during 1999-2000. Averages for fuel use and fuel costs were 550 gallons and \$825. Maintenance costs the last three years were \$15,000 in 1998 when the engines were overhauled and the hull was sandblasted, \$800 in 1999, and \$500 in 2000. The O. MYKISS is hauled out and painted annually at a cost of \$1,100 and dry docked during the non-operational season. The biologist in charge of the station and the boat operator prepare the vessel maintenance budget. The boat operator and deckhand work together to schedule maintenance as indicated in the vessel maintenance log. The maintenance log is based on manufacturer's recommendations. Maintenance is also done based on the recommendation of the boat operator when the need arises. The boat operator is responsible for purchasing vessel equipment and overseeing maintenance projects from scheduling to completion. The crew does routine maintenance including electrical work and painting. Maintenance such as winterization, engine inspections and overhauls, and sandblasting are contracted out. The frequency of unforeseen repairs has not increased in recent years. When unforeseen repairs occur, the repairs are handled as quickly as possible. Some assessment effort was cancelled in 1998 when the O. MYKISS engines had to be overhauled. The crew of the O. MYKISS has ready access to parts suppliers and repair facilities at or near Michigan City. Budgetary support for O. MYKISS operation and maintenance costs come from general tax revenue, money from the sale of fishing licenses, and Federal Aid for Sport Fish Restoration reimbursement. This support has been steady and adequate for the past 10 years.

VESSEL INSPECTIONS, AND SAFETY: To the knowledge of the Michigan City station staff, the O. MYKISS has not been inspected by a marine architect nor has there been a stability test done. Safety training for the O. MYKISS crew includes monthly OSHA safety meetings and use of safety equipment. Safety equipment on the O. MYKISS includes an EPIRB, three Mustang survival suits, and various types of PFDs. Fire suppression equipment includes an extinguisher in the engine compartment and several portable extinguishers above deck.

FUTURE VESSEL PROGRAM: The Michigan City station staff believes that they have good support for their vessel program. The operation and maintenance budget has been adequate and they have approval to fill the Operator/Property Manager vacancy. They think they will have a vessel program 20 years from now as long as they do not have major problems with the O. MYKISS. The staff believes the program will likely be unchanged in terms of type of assessments, but would likely expand these assessments and spend more time on the water once the vacant operator position is filled and especially if a desired additional professional position is approved and filled for the vessel.

VESSEL FITNESS AND FUTURE: The O. MYKISS is a little small for work in rough seas so weather conditions must be considered before setting assessment nets. Also the amount of deck workspace is less than desired. The noise within the pilothouse at times makes it difficult to communicate with others. Strengths of the vessel are its size. It is a small vessel, which requires less maintenance. It is fast, has good maneuverability, and is structurally sound since it is primarily constructed of aluminum. Generally, the O. MYKISS accommodates the Michigan City station's vessel program, provides the basic needs of the crew for comfort and safety, and should last at least 15 years with regular maintenance. Replacement or major retrofit of the O. MYKISS is not being considered at this time. However, if it were to be replaced that decision would be made by the biologist in charge of the station and the boat operator, with input from a marine engineer or architect. Criteria for replacement would include vessel condition especially as it effects safety and repair frequency. Specification for a replacement

vessel would be one larger than the O. MYKISS with more deck workspace and a smaller pilothouse. The station staff would likely try to get the new larger vessel from Sea Ark Marine because Sea Ark makes a larger vessel that would meet their specifications and they have been otherwise satisfied with the O. MYKISS.

VESSEL PROGRAM SUMMARY

VESSEL NAME: **BARNEY DEVINE**
OPERATOR: Wisconsin Department of Natural Resources, Sturgeon Bay Fisheries Station, Sturgeon Bay, Wisconsin
LAKE: Michigan
HOME PORT: Sturgeon Bay, Wisconsin
CAPTAIN: Don Bielfuss
STATION ADMINISTRATOR: Mike Toneys

PROGRAM DESCRIPTION: The annual operating season for the BARNEY DEVINE begins with an early-April to early-May lake-wide assessment of lake trout and burbot followed by a two-week assessment of juvenile lake whitefish in northern Wisconsin waters. Chinook salmon populations in the Sturgeon Bay area are sampled during July. In September, chubs (deep-water ciscoes) and lake trout are assessed in the northern part of Wisconsin waters at Baileys Harbor and Jacksonport Deep Reef, respectively. During October, inshore and offshore lake trout spawning populations are assessed from Sturgeon Bay to Sheboygan, and lake whitefish spawning populations are sampled north of Sturgeon Bay at Cardy's Reef. Spawning lake trout are sampled on Jacksonport Deep Reef from the last week of



October to mid November, and then the boat is moved to Milwaukee to sample yellow perch during the last week of November into the second week of December. The BARNEY DEVINE operates about 75% of the available time from April to mid December. All assessments are done with gill nets, mainly graded-mesh (mesh sizes dependent on species) that are fished on the bottom, except that nets used for chinook salmon are many meshes deeper and fished suspended. These assessment-netting surveys have made up nearly 99% of the operational year for the BARNEY DEVINE in recent years, with 1% covering occasional assistance to Wisconsin Department of Natural Resources (WIDNR) Law Division in pulling illegal gill nets. The work on lake trout and yellow perch done with the BARNEY DEVINE in Wisconsin waters is part of lake-wide efforts involving many other agencies. The WIDNR currently does not do contact work with the BARNEY DEVINE, nor does it currently contract out any vessel work to other entities. They have previously contracted some gill netting and trawling with commercial fishers but found it to be very expensive. The WIDNR has recently purchased a 45-foot New England lobster boat, the Perca, which is being retrofitted for trawling and fishing salmon gill nets. It will likely be used for chinook salmon and yellow perch assessment and stationed in Milwaukee.

VESSEL DESCRIPTION: The BARNEY DEVINE is a Great Lakes gill-net boat designed and built in 1937 by Burger Boat of Manitowoc, Wisconsin. It is steel-hulled, 50 feet long, a beam of 14.5 feet, a draft of 5.5 feet, and a displacement of 37 tons. The work deck is most the enclosed internal area of the boat, which is approximately 700 ft². It does have a commode in a small space forward. The BARNEY DEVINE is powered by a 235 hp Cummins diesel engine that was installed in 1972. Total engine hours are approximately 10,000 with 755 hours since the last overhaul. Onboard electrical power is provided by a diesel-powered 8.5 kW Onan generator installed in 1995. Deck machinery consists of a Crossley gill-net lifter that is believed to have been installed in 1937. Pilothouse electronics includes a Simrad Robertson autopilot installed in 1999, a Simrad radar installed in 1998, a Northstar X41 GPS installed in 1991, a Garmin 210 GPS installed in 1997, a Furuno depth sounder installed in 1983, a Datamarine depth sounder installed in 1999, two Icom marine radios (I10 and I06) installed in 1993 and 1999 and a cellular phone.

VESSEL STAFFING: The Sturgeon Bay station administrator position is classified as Lake Michigan Fisheries Biologist and is responsible for the BARNEY DEVINE operation and staffing budgets, supervises the crew and shares responsibility with his supervisor for filling crew vacancies. The current crew of the BARNEY DEVINE is

made up of a boat captain, classified as a Research Technician IV, and an engineer/deck hand, classified as a Research Technician III. Biologists and technicians represent at-large crewmembers that serve on the boat when assessment netting is done. This crew and scientific staffing is similar to staffing 20 years ago. The vessel crew and scientific staff share many jobs during the assessment netting and work together well. The current captain has served on the BARNEY DEVINE for 14 years, 12 years as the engineer and 2 years as captain. He also served on a university vessel (Neeskay) for 9 years. The current engineer has been on the BARNEY DEVINE for a year and prior to that he was a Washington Island ferry captain. Boat captains and engineers are hired following Wisconsin Civil Service rules. Applicants for these positions are screened and selected based on Civil Service test scores or evaluation of an experience history questionnaire and an interview. The boat captain of the BARNEY DEVINE must have a Coast Guard 100-ton Masters License, whereas the engineer must be able to qualify for a 100-ton Masters License within three years. Starting and top annual salaries for the boat captain and engineer are \$28,804-\$41,367 and \$26,622-\$38,006, respectively. The crew of the BARNEY DEVINE earns about 100-125 hours of time-and-a-half overtime per year. This is paid full-time compensatory time and half-time pay for each hour worked over 40 hours per week. The crew spends about 35-40% of its time on non-vessel related projects such as station maintenance, fyke netting, diving, electro-fishing, fish aging, and data entry. The crew receives annual safety training and has attended fish-aging workshops.

VESSEL OPERATION AND MAINTENANCE COSTS: The BARNEY DEVINE operated an average of 107 days annually during 1998-2000. Main engine hours averaged about 350 annually during this period. Fuel and maintenance expenses averaged \$11,750 annually for 1998-99. The BARNEY DEVINE is hauled out every three years and painted. The last haul-out was in 1999 and cost \$7,000. The hull was sandblasted four years ago, which was for the first time. The boat captain schedules maintenance projects, based on manufacturer's recommendations or as needed, and the station administrator approves them and is responsible for providing budget support. Maintenance projects are planned at least two years in advance because the budgets are planned every two years. The projects are done by the boat captain and engineer except engine overhaul and sandblasting. The frequency of unforeseen repairs has not increased in recent years and unforeseen repairs have not resulted in cancellation of all or part of a survey. Access to parts and repair facilities is good. There are two shipyards in Sturgeon Bay and a Cummins diesel repair facility in Green Bay where service can be obtained within a day.

VESSEL INSPECTIONS, AND SAFETY: The BARNEY DEVINE was inspected in 1999 by a marine architect and received a pretty good bill of health. A hull ultrasound was done in 1999 by a company hired by the boatyard. No stability test (inclining experiment) has ever been done. When the old heavy engine was replaced a lighter diesel in 1972, 7-8 thousand pounds of lead was added to compensate for the difference in weight of the engines. Fire fighting equipment on the BARNEY DEVINE consists of hand-held fire extinguishers, a big one by the engine room and several smaller ones distributed around the boat, and an emergency pump for the bilge and for fire fighting. The crew receives fire-fighting training from the Sturgeon Bay Fire Department, CPR and First-Aid training, and has participated in abandon-ship training at the annual Great Lakes Vessel Coordination Workshop.

FUTURE VESSEL PROGRAM: The Sturgeon Bay Fisheries Station staff hopes that their station will have a vessel program 20 years from now, but they are not sure. Vessel staffing and vessel budget has been adequate in recent years, and staff believes that they have good support within WIDNR for their vessel program. They have always gotten what they needed to maintain the BARNEY DEVINE even though maintenance costs have increased in recent years. The Sturgeon Bay vessel program for the next 20 years is likely to continue to be mainly gill-net assessments of major species. This will certainly be the case for as long as the station is using the BARNEY DEVINE because that's what it is set up to do. Some trawling will be done when the Perca becomes operational. The station staff would like to do a more varied vessel program by using the Perca and perhaps replacing the BARNEY DEVINE with a vessel that is more versatile. However, vessel staffing is inadequate to operate both vessels at the same time and scientific staffing is inadequate to handle much more data so broadening the vessel program will be difficult. Currently, there are no boat captain or engineer for the Perca, so until these positions are filled, it will be operated by the BARNEY DEVINE crew. The Sturgeon Bay staff believes that filling positions on the Perca may be difficult because the pay is less than for comparable positions in other agencies. The research technician classification and pay rate assigned to boat captains and boat engineers does provide adequate recognition for the difficult and responsible nature of these jobs.

VESSEL FITNESS AND FUTURE: In the opinion of the Sturgeon Bay staff, the BARNEY DEVINE has been well built, well maintained, economical to operate, and has been a dependable boat. On the other hand, it is 64 years old, the hull is getting weak in the stern area, and the station staff believes that it will last maybe 10 years but not 20. Station staff will likely recommend that the BARNEY DEVINE be replaced once the Perca has become fully operational. Specifications for a replacement boat would be a design that allows sampling with different types of gear, more crew accommodations for long runs, and a dry or wet lab. The Sturgeon Bay staff believes the process for vessel replacement would be for the station staff to determine specifications of the replacement vessel, get a cost estimate, prepare a justification package describing why the new vessel is needed and why the BARNEY DEVINE can't be used. This package would then be sent to the WIDNR in Madison for approval and forwarding to the Department of Administration. Ultimately the governor and legislature would have to be involved. Station staff believes there are shipyards at Sturgeon Bay that could build a vessel to replace the BARNEY DEVINE (Palmer-Johnson, Bay Ship).

VESSEL PROGRAM SUMMARY

VESSEL NAME: JUDY
OPERATOR: Michigan Department of Natural Resources, Marquette Fisheries Research Station, 484 Cherry Creek Road, Marquette, MI 49855
LAKE: Superior
HOME PORT: Marquette, MI
CAPTAIN: James E. Knape
STATION ADMINISTRATOR: Phil Schneeberger, Shawn Sitar (biologist) interviewed

PROGRAM DESCRIPTION: The current Marquette Fisheries Research Station program on Lake Superior focuses on gathering biological data on lake trout from assessment gill nets, lake whitefish from monitored commercial catches, and sport-fish species including lake trout and lake whitefish from a creel survey. Assessment gill netting is done with the JUDY, contracted commercial fishermen, and in cooperation with biological staffs from several Native American tribes. The JUDY is used to assess adult lean variety lake trout populations during May and June, and pre-recruit lean and siscowet lake trout in late July through August. The adult lean assessment has been done annually since the early 1960s. The pre-recruit assessment was started in the 1970s by what is now the U.S. Geological Survey (USGS) Biological Station in



Ashland, Wisconsin, and it has been done annually by the Marquette Fisheries Research Station since 1985. Although not conducted annually, the JUDY has been used to do periodic assessments of spawning lean lake trout in late October to early November, and all-age assessments of siscowet lake trout in June or September. These assessments are done lake-wide in cooperation and coordination with other members of the Great Lakes Fishery Commission Lake Superior Technical Committee. The spring adult lean lake trout assessment is done with 4.5-in mesh nets fished on the bottom three nights, whereas the pre-recruit, siscowet, and spawning lean lake trout assessments are done with graded-mesh gill nets fished on the bottom one night. The number of JUDY operating days has ranged from 35-36 in 1998-99, when only the adult lean and pre-recruit assessment was done, to 50 days in 2000 when additional all-age siscowet and spawning lean lake trout assessments were done. The JUDY is occasionally used to assist Michigan Department of Natural Resources (MIDNR) Law Division locate and lift illegally set commercial gill nets. It was used as a dive platform for lake trout egg incubation studies in the late 1980s and early 1990s. However, assessment gill netting has always made up 95-99% of the JUDY operating days. Marquette Fisheries Research Station personnel also do studies on yellow perch and walleye populations in Green Bay, Lake Michigan, sample lake whitefish commercial fisheries in Lake Michigan and Lake Superior, and do lake sturgeon reproduction and stream-fish community studies in Michigan streams. The JUDY has not been contracted to do work for other entities. Any contract money earned by the JUDY would not go back to the Marquette Fisheries Research Station program. Assessment of adult lean lake trout has been contracted out to commercial fishers via issuance of research permits with payment to fishers being retention of a quota of saleable lake trout and some cash payment for fuel used in recent years. Currently there is only one such contracted commercial fisher.

VESSEL PHYSICAL DESCRIPTION: The design of the JUDY is that of a Great Lakes trap net boat but it has been modified for lifting gill nets by the addition of a gill-net lifter forward of amidships on the starboard side. The JUDY was built in 1952 by Marinette Marine of Marinette, WI. The Marquette Fisheries Research Station acquired the JUDY in 1979 via the MIDNR Charlevoix Fisheries Station and USGS. The JUDY's hull is 3/16th inch steel, length at the centerline is 40 ft., beam is 12 ft., displacement is 20,000 lbs, and draft is 3 ft. Deck workspace is limited to the aft deck (275 ft²), although there is a little space in the pilothouse for doing paperwork.

The forward 30% of the aft deck is covered with a canvas canopy to provide the crew protection from sun and rain while lifting the gill nets. There are no bunks, commode, or dry lab. The JUDY is propelled by a single General Motors diesel engine (GM 6-53-V) that generates about 180-200 hp, which cruises the JUDY at 8.9 knots with a maximum speed of 10 knots. It has a PTO-mounted hydraulic gear pump which powers a capstan of unknown make for lifting trap nets and a Crossley 24-inch gill-net lifter. Pilothouse electronics include a Cetrek Pro Pilot 725 autopilot installed in 1996, Furuno 821 radar installed in 1997, North Star 951XD GPS installed in 2000, a Micro Logic ML-8000 loran installed in 1988, Raytheon V-900 and a Data Marine Sand Piper II depth sounders installation not known, Sitex Ultima marine radio installed in 1999, and a MIDNR radio installed in the 1980s.

VESSEL STAFFING: The current crew of the JUDY consists of a full-time boat captain and two 10-month fisheries assistants. The boat captain holds a Coast Guard 50-ton Masters License and has captained the JUDY for about 3 years, with some year's prior experience captaining private recreational boats. The fisheries assistants have been in their position about 9 years with no prior comparable experience. Although knowledge of fishing and fishing gear is desirable for conduct of the vessel program, it is not a job requirement for any crew position. The previous JUDY boat captain had commercial fishing experience and he taught the current fisheries assistant's aspects of boat operation and how to set, lift, and repair nets. In the 1980's, the boat crew consisted of a full-time captain and a full-time fisheries boat aide, with biologists or technicians filling out the crew necessary to fish the nets and collect data. A full-time assistant boat captain was hired in the 1980s but the person left the job, the position was not refilled, and eventually the position was lost. Currently, one fisheries assistant functions as an assistant captain while the other handles the data collection. A biologist was generally on board for 45% of the operating days and a technician was on board 9% of the time during 1998-2000. The vessel crew and scientific staff share jobs and generally work well together. Since only a little more than a third of the Marquette Fisheries Research Station program involves large-vessel Great Lakes work, the crew spends about 50% of its time on non-vessel related projects such as sampling commercial fish catches, walleye tagging, stream-fish population estimates, lake sturgeon reproduction, maintenance related to these other studies, and determining the age and food habits of fish collected with the JUDY and on these other studies. The crew receives annual and periodic safety training, and periodically the GLFC, Lake Superior Technical Committee has sponsored workshops on fish aging and sea lamprey attack-mark identification. The crew is also eligible for training available to all state employees, such as computer training. Most work-related training is on-the-job.

VESSEL OPERATION AND MAINTENANCE COSTS: The JUDY operated an average of 40 days during 1998-2000. Main engine hours averaged 280 for 1998-2000 and ranged from 257 in 1998 and 323 in 2000. Fuel use averaged 1,111 gallons annually and was 1,014, 900, and 1,420 gallons in 1998, 1999, and 2000, respectively. The JUDY used an average of 4.0 gallons of fuel per engine hour during these past three seasons. Annual fuel expense averaged \$1,167 during 1998-2000 and averaged \$29 per operation day and just over \$4 per engine hour. Average annual maintenance cost was \$5,800 during 1998-2000. Normal annual maintenance costs have averaged about \$1,100 in recent years but was \$2,300 in 1999 due to replacement of the propeller and propeller shaft, and \$14,000 in 2000 when hull sandblasting and painting was done. New equipment installed in the last three years included a \$3,000 GPS/Chart Plotter and a \$250 Sitex Marine Radio. The JUDY is hauled out annually for maintenance and dry-docking at an annual cost of around \$900, which includes rental of outside storage and contracted hauling services out and back in the water. Since fuel plus normal maintenance plus haul-out averaged about \$3,167 annually during 1998-2000, vessel operation expense per operation day and engine hour were \$79 and \$11, respectively. The JUDY is hauled out, stored, and returned to the water on its own trailer. The Marquette Fisheries Research Station gets \$5,000-\$6,000 annually for overtime but the amount spent on vessel-related overtime is not known. The boat captain schedules maintenance projects, using manufacturer's recommendations when available, and the station administrator secures budget support and provides project oversight. The captain and crew do most installation of electronic equipment and maintenance other than major engine and hull work. Money is usually available for maintenance necessary to keep the JUDY operating, but less available for maintenance that is of a preventative nature but not yet critical for operation. Unforeseen repairs have been minor, have been handled within a day or two by the crew, and have not resulted in cancellation of all or part of an assessment. The JUDY's homeport of Marquette does not provide ready access to parts suppliers and repair facilities. The nearest shipyards on Lake Superior are 150-300 miles away at Sault Ste. Marie, Michigan and

Duluth, Minnesota. Engine repair for the JUDY can be obtained 5 miles away at a MIDNR facility that maintains fire fighting heavy equipment.

VESSEL INSPECTIONS and SAFETY: A Condition and Valuation Survey was done on the JUDY by a marine surveyor and a hull ultrasound was performed in 2000. The only other known survey was done in 1996 by a heavy equipment surveyor. No stability test has been done on the JUDY since acquired by the MIDNR and station staff has no knowledge of a previous test. The crew receives safety training annually including First-Aid/CPR, life raft and survival suit use, and abandon-ship. The JUDY carries a 6-person life raft (Switlick MD-6 Offshore Solas A), two EPIRBs, six survival suits, and (?) life jackets. Fire suppression equipment includes a Halon system in the engine compartment and two hand-held extinguishers. The JUDY has two electric bilge pumps (Rule, Lovett).

FUTURE VESSEL PROGRAM: The Marquette Fisheries Research Station staff believes that the station will have a vessel program 20 years from now and that the program will be similar to what it is now. They feel that general support for their station's program is good at the Research Section level but less at division and department levels. The Marquette Fisheries Research Station staff believes that lake trout assessment will likely be the priority work in Michigan waters of Lake Superior for the next 20 years and possibly longer. Lake trout are the dominant predator in the lake and sought after by sport anglers and by Native American commercial fishers who have treaty fishing rights. A consent decree negotiated in 2000 for an 1836 treaty, mandates that state, federal, and tribal agencies work together to determine safe harvest limits and specifies allocation of the harvest between sport and commercial fishers in Michigan's eastern Lake Superior waters. The ongoing gill-net assessments are the main source of relative abundance, age, and mortality rate data necessary for determining the safe harvest limits. The Marquette Fisheries Research Station vessel program may need to carry a larger assessment load in the future because it is believed that the commercial fishery at Marquette, currently contracted to do lake trout assessment, will sell their gill-net boat in the near future. Tribal biological agencies, which currently are doing lake trout assessment in four Michigan management areas, have only small boats and may lack the time and capacity to do assessment in other Michigan waters. Marquette Fisheries Research Station staff would like to maintain its current responsibilities for lake trout assessment and expand assessments to some other species or do habitat mapping and acoustic surveys. However, this may be largely out of the question unless the current inadequate vessel and scientific/technical staff is increased to levels necessary to process in a timely manner the current influx of data, conduct an expanded vessel operation, and process the additional data. Station staff recommends that the JUDY crew should consist of a full-time boat captain, full-time assistant boat captain, full-time technician, and a 10-month fisheries assistant. The Marquette Fisheries Research Station currently lacks an assistant boat captain and has only one fisheries technician, who because of the station's program diversity and workload, cannot be assigned to the JUDY except on an occasional basis. Lack of technical staffing also requires that the JUDY crew must function as technicians on non-vessel projects for a considerable portion of the year. Use of fisheries assistants as a major component of the JUDY crew is problematical because the position requires an annual layoff period and personnel are subject to statewide hiring freezes when they occur during layoff. If a hiring freeze persisted into the vessel operation period, the vessel would have to operate without these personnel or cancel the assessments.

VESSEL FITNESS and FUTURE: Although the JUDY is small and not designed optimally for the work it is doing, it has proved able to meet the needs of the current station program. Rarely have sea conditions prohibited use of the JUDY for setting or lifting gill nets during the current lake trout assessments. This success is in part due to the short operating season and relatively good weather during May-August when most of the netting is done. The JUDY has not been used extensively in the fall in recent years when weather on Lake Superior is notoriously bad (witch of November, etc.), and since her hull was not designed for ice breaking and has deteriorated somewhat over the years, ice conditions would prohibit use during at least January-April. The strengths of the JUDY are that she has been a reliable, low-cost work platform that is easy to haul out and maintain. Her size and draft permits access to shallow small harbors and docking facilities, which is critical because good docking facilities are few and far between along Michigan's Lake Superior shore. The weaknesses of the JUDY are that her trap-net design make operation in rough sea conditions difficult, the only possible position of the gill-net lifter is not far enough forward for optimal boat control during gill net lifting, there is no dry lab space or enclosed wet lab space, and a recent hull sandblasting and ultrasound indicated that some areas of the hull are 65% of original thickness. Money to rewire the JUDY to code specifications has been requested annually for nearly 10 years but has not been

forthcoming. The engine is old and will need an overhaul in the near future. In addition, the JUDY lacks dry-lab facilities that would be necessary to house technological equipment if the station wanted to undertake habitat mapping and acoustic surveys. Consequently, the Marquette Fisheries Research Station is considering replacement of the JUDY. Specifications being considered for a replacement vessel include a slightly larger and faster vessel with more displacement, a draft not exceeding 4 feet, and dry lab space. The Marquette staff is working with the ad hoc committee of MIDNR boat captains and management to develop design specifications, cost estimates, and a process for obtaining approval and funding for the JUDY and one or two other agency vessels. Station staff believes that the current and foreseeable fiscal environment within MIDNR is not suitable for obtaining desirable staffing levels or replacing the JUDY.

VESSEL PROGRAM SUMMARY

VESSEL NAME: HACK NOYES

OPERATOR: Wisconsin Department of Natural Resources, Bayfield, Wisconsin

LAKE: Superior

HOME PORT: Bayfield, Wisconsin

CAPTAIN: Vacant (Scott Hulse, First Mate)

STATION ADMINISTRATOR: Stephen Schram

PROGRAM DESCRIPTION: PROGRAM

DESCRIPTION: The annual vessel program of the Wisconsin Department of Natural Resources (WIDNR) Bayfield station begins with the spring assessment of adult lean lake trout, using 4.5-inch mesh gill nets, starting in early April or as soon as the ice is out. This goes into May, usually 5-6 weeks. Late May and June is used for vessel maintenance or to do siscowet lake trout assessment with large graded-mesh gill nets if scheduled by the Lake Superior Technical Committee. The next regular assessment is the summer graded-mesh assessment targeted at juvenile lake trout, which starts in July and goes into August. Plankton



samples are also collected during this assessment for Michigan Technological University in Houghton, Michigan. In September, the HACK NOYES is used as an educational platform for high school and university students and also to move Gull Island Shoal Refuge buoys. The HACK NOYES is then used to do gill-net assessments of spawning lake trout populations in October and spawning lake herring during the last week of November and first week of December. Law Division may use the vessel for a few days after that to check that commercial fishing nets are set in the proper locations. Fish population assessment with gill nets makes up 95% of the HACK NOYES operation days with the remaining 5% being for educational purposes or assistance to Law Division. Most assessments of lake trout and lake herring and inclusive months of operation have been unchanged over the past 20 years. Prioritization resulted in some spring and fall assessments using small-mesh gill nets being dropped because more data was being collected than could be processed. The HACK NOYES was used in 1996-97 to assist University of Wisconsin personnel in a hydro-acoustics study of Wisconsin waters of Lake Superior. Additional work in recent years has been the educational work and occasional siscowet assessments. Although there is not a sharing of vessels and personnel, much of the work done with the HACK NOYES is cooperative with other agencies of the Lake Superior Technical Committee in that the assessments are done in a standardized protocol agreed to by the committee and results are shared with committee members. The Bayfield station also does some other work on Lake Superior with small boats. It has a 24-foot welded aluminum boat made by Thomas Marine of Long Island, New York, which is used for gill netting in Chequamegon Bay, surveying underwater logging sites with an ROV, and as a dive platform. The station also has some smaller aluminum boats, which are used for fyke netting. The Bayfield station does not do contract work with the HACK NOYES, nor does it contract out any of its vessel work. The station administrator doubts that money earned by use of the HACK NOYES would come back to the station program. The station has considered contracting with the USGS Ashland Biological Station or University of Minnesota for trawling at Gull Island Shoal but decided that the cost was too high.

VESSEL DESCRIPTION: The HACK NOYES is a Great Lakes gill-net design boat made by Burger Boat of Manitowoc, Wisconsin in 1946. It was purchased by the WIDNR in 1952. The HACK NOYES is steel-hulled, 56 feet long, beam is 14.5 feet, draft is 5.5 feet, and displacement is 50 tons. Workspace is 224 ft² forward, 96 ft² amidships, and 280 ft² aft. Most of the area is enclosed and might be considered a wet lab. There is no dry lab

space. Crew accommodations include three makeshift bunks in the pilothouse and one commode. The HACK NOYES is powered by a Cummins NT-335M diesel that generates 335 hp and cruises the vessel at 10 knots. The engine was installed in 1970, has 16,614 engine hours, with 6,378 hours since the last overhaul. The HACK NOYES has a Wesmar T25 hydraulic-powered bow thruster with a 12-inch nozzle. It has a Luggier/Northern Lights (NL 844) 16KW generator that was installed in 1994. Deck equipment includes a Crossley 30-inch hydraulic-powered gill-net lifter, a small detachable crane and electric winch with a 500 lb capacity. Other equipment includes an electric live-well pump, an electric shallow-water jet pump with hot-water heater, and two hydraulic pumps for the gill-net lifter and bow thruster. Pilothouse electronics include a Wood Freeman Model 420 autopilot installed in 1974, an Anritsu RA771UA radar installed in 2000, a Garmin 6PS 75 GPS installed in 1997, a Cetrek P1LD 200T CK1 GPS installed in 1998, a Morrow LLC-4000 Ioran installed in 1983, Datamarine D3001 and Furuno FCV 600L depth sounders installed in 2000, a Polaris Regency ECN 1880 marine radio installed in 1980, a Bendix King LMH 3142 WIDNR radio installed in 1980, a Kodex D6BS Diff.Rec KBR-91 installed in 1997, and an E. S. Richie & Sons compass.

VESSEL STAFFING: The Bayfield station administrator position is classified as Lake Superior Fisheries Biologist and is responsible for the HACK NOYES operation and staffing budgets. The administrator schedules vessel work but shares supervision of the crew and responsibility for filling crew vacancies with a lake-basin sub-team leader. The current crew of the HACK NOYES consists of a boat captain, classified as a Research Technician IV, who operates the boat, a first mate, classified as a Research Technician III, who assists the boat captain and helps supervise deck operations and data collection, a technician assigned halftime to the boat who does data collection, and a 6-month limited-term employee hired as a deck hand for the operational season. The above four members of the crew handle much of the vessel work, except that a biologist and sometimes an additional technician are on board for spring lake trout, spawning lake trout, and herring assessments. This crew composition is similar to what it was 20 years ago. The previous boat captain was on the HACK NOYES for 3 years, the first mate has 21 years of experience, and the technician has been on the boat for 8 years. The boat captain is required to have a Coast Guard 100-ton Masters License to operate the HACK NOYES. The first mate does not need the 100-ton license coming into the position but must be qualified to obtain it within three years. The current first mate is qualified but does not yet have this license. The technician and limited-term employee does not need any special licenses pertaining to the boat. Crew annual salary ranges are \$28,804-\$41,367 for the boat captain and \$26,622-\$38,006 for the mate and technician. The crew earns full-time compensatory time off and half-time pay for hours exceeding 40 hours per week. All but the limited-term person gets sick and annual leave. Each member of the crew received an average of \$60-\$100 per month for travel expenses during 1998-2000. The crew receives annual safety training and work related training on-the-job. The crew of the HACK NOYES spends about 25% of its time on non-vessel related projects such as station maintenance, fish aging, and stream sampling.

VESSEL OPERATION AND MAINTENANCE COSTS: The HACK NOYES operated an average of 78 days per year during 1998-2000. Main engine hours averaged 499. Averages for fuel use and fuel cost were 2,391 gallons and \$2,550 during 1998-2000. The normal average annual maintenance expense is around \$2,000. Maintenance cost was \$14,500 in 2000 when the boat was hauled out, sandblasted, painted, and some new electronic equipment (radar, two depth sounders) were purchased and installed. The HACK NOYES is hauled out every three years at a cost of \$2,000 just for the haul-out. The boat captain and first mate are responsible for scheduling maintenance projects. The station administrator is responsible for the maintenance budget and project oversight. Maintenance is scheduled based on the judgment of the boat captain and first mate and recommendations in maintenance manuals. Hull sandblasting and painting is done every three years, engine tune-ups and overhauls are done as needed. The crew does routine maintenance and repair of small mechanical equipment such as pumps, whereas major maintenance is contracted out. Unforeseen repairs are handled as quickly as possible and have not caused cancellation of all or part of an assessment. The frequency of unforeseen repairs has not increased in recent years on the HACK NOYES. Although not at Bayfield, parts and repair service can be obtained quickly at Duluth, Minnesota, which is less than 100 miles away. Currently, WIDNR support for the HACK NOYES vessel program is high. Budgetary support, although flat in recent years, has been good to outstanding. The Bayfield station has been able to get the funding it has requested and the vessel program has not been compromised by inadequate budget.

VESSEL INSPECTIONS, and SAFETY: The Coast Guard gave the HACK NOYES a courtesy inspection in 1994. The boat captain did a hull ultrasound in 1996. It is not known if the HACK NOYES has ever been given a stability test (inclining experiment). Modifications to the boat done by WIDNR that might affect stability include replacement of the engine in 1970, the pilothouse was replaced with a larger one in 1973, and a bow thruster was installed in 1985. The safety equipment on the HACK NOYES includes a BF Goodrich Solas B MK3 life raft that is inspected annually, a Kannad 406 EPIRB, 8 survival suits, and 8-12 life jackets. Fire suppression equipment includes 9 hand-held fire extinguishers (7 dry chemical, 2 CO₂) and 2 water hoses (fore and aft). The crew receives medic first-aid training with CPR, fire-fighting techniques from the Ashland, Wisconsin Fire Department, and training on use of the life raft from the manufacturer. A vessel safety manual that provides information on such things as fire fighting, survival suits, and abandon ship is reviewed annually.

FUTURE VESSEL PROGRAM: The Bayfield station staff believes that the station will have a vessel program 20 years from now, citing the need for maintaining the long-term data sets on lake trout as rational. They foresee little change in the basic surveys they are doing now. Since the major funding source for the WIDNR is fishing license and fishing stamp revenue, there is concern that if sport fishing continues to decline they will receive decreased funding for their vessel program. Staffing is perhaps the biggest concern of the Bayfield station for its future vessel program. The Bayfield staff does not know if the person who has captained the boat the past four years will be in that position for the 2001 operating season. If the position must be filled with another person, finding a qualified candidate will be difficult. The boat captain and first mate are classified as research technicians rather than boat-identified classifications and the salaries for these classifications are lower than comparable boat positions in neighboring agencies. This makes recruiting competent people for these positions difficult, especially given the rather small pool of qualified applicants in the area. They feel that the research technician classification and pay rate does not provide adequate recognition for the difficult and responsible nature of the boat captain and engineer jobs.

VESSEL FITNESS AND FUTURE: In the opinion of the Bayfield station staff, the HACK NOYES is a sturdy seaworthy vessel that will last at least another 20-25 years, it is a safe work place, its operating expenses are reasonable, and it meets current and projected program needs. The HACK NOYES is not being considered for replacement by the Bayfield staff. However, it is an old vessel, is slow, and should have the current pilothouse replaced with a smaller one for better handling in wind. In addition, some sections of the hull may have to be replaced in the next 20 years due to pitting. A retrofit to replace the pilothouse or hull plates would probably be done at the Fraiser Shipyard in Duluth, Minnesota.