

## **SURVEYS AND INVENTORIES - PROJECT EVALUATIONS**

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STUDY NUMBER 1: Aquatic Investigations of the Missouri River System in North Dakota

### Adequacy:

The objective of Study 1 is to sustain and enhance a diverse fishery in Lakes Sakakawea and Oahe, and the Missouri and Yellowstone Rivers for the enjoyment of the public while maintaining native fish populations.

Surveys conducted as part of Study 1 provide the information necessary to comprehensively manage the system. Standardized sampling is conducted annually on Lakes Sakakawea and Oahe to assess the adult fish populations and their reproductive success. Sampling on the Yellowstone and Missouri Rivers is complicated by flows and fluctuating water levels so different sampling techniques have been incorporated for the river portions. Techniques continue to be refined in an effort to standardize sampling efforts.

Standard adult fish population monitoring provides information on population abundance, mortality rates, growth rates, and body condition. These data are used to make decisions regarding fishing regulations, forage deficiencies, etc.

Sampling is done annually on Lake Sakakawea to assess the rainbow smelt population, the lake's main forage fish. Due to prolonged drought conditions, smelt reproduction has been very poor and the population is currently at an all-time low. These data are used to make decisions on stocking rates of predator fish, assessing alternate forage fish, and for making recommendations to the Army Corps of Engineers for their Annual Operating Plan to preserve habitat necessary for smelt reproduction.

Fall sampling is conducted annually throughout the system to assess fish reproduction. This information is used to track reproductive success of game fish species. Data from fall reproduction sampling are used to determine stocking rates of key game fish species. Since it is targeted at smaller fish, the fall sampling also provides valuable information on forage fish abundance and on smaller-bodied native or non-game fishes.

Necessity:

The Missouri River System (MRS) is valuable to the people of North Dakota from both a recreational fishery and economic standpoint. Annually the system is used, at one time or another, by 40 to 50 percent of North Dakota's licensed anglers. It is also a major destination of non-resident anglers and supports numerous fishing tournaments. Direct and indirect expenditures for recreation on the MRS comprise a significant part of the economy of the region.

A management plan has been developed for the Missouri River system in North Dakota. Collection, analysis and interpretation of data under Study 1 was used in establishing scientific management criteria in order to optimize angler opportunities. When the management plan is updated, information from Study 1 surveys will be used to evaluate the success of specific management actions, and alter or develop new objectives. At the same time, important areas of habitat will be identified and steps taken to provide long-term protection for both recreational species and species of concern (e.g., native, non-game).

Reliability:

The standardized sampling surveys conducted under Study 1 are designed with rigorous scientific standards to provide reliable information necessary for managing the fisheries of the Missouri River System. In the Williston reach near the confluence of the Yellowstone and Missouri Rivers, adult paddlefish are tagged annually from the spawning run. This tagging has been ongoing since 1993, and over the years the accumulation of tags in the population have increased the power of this dataset. Tag return data are used to estimate paddlefish population size, determine harvest season and bag limit restrictions, and to monitor movements of this unique fish to better understand their ecology.

Lake Sakakawea is broken into twenty sampling areas, and each area is sampled with multiple nets annually to assess adult fish populations (summer) and reproductive success (fall). Hydroacoustic sampling and larval trawling are conducted throughout the reservoir to track the rainbow smelt population. Since hydroacoustic sampling utilizes several transects, and covers a much larger proportion of the reservoir than pelagic netting operations, the hydroacoustic data provide relatively precise estimates of population abundance.

Sampling on the Missouri River below Garrison Dam is complicated by flows and fluctuating water levels so different sampling techniques have been developed for those portions. Similar to the netting surveys on Lake Sakakawea, multiple stations are sampled annually on the river using electrofishing techniques to assess adult population status and reproductive success. Due

to low water levels, much of the North Dakota portion of Lake Oahe is currently riverine, so similar sampling has been adopted for that reach as well. Techniques continue to be refined in an effort to standardize sampling efforts.

Efficiency:

The surveys conducted under Study 1 are designed for scientific validity and efficiency. Sampling duties are divided among three district offices, with each district conducting sampling proximate to their location. Williston staff conduct most sampling on the Williston reach and the Yellowstone River, Riverdale staff conduct most sampling on Lake Sakakawea and the Garrison Dam Tailrace, and Bismarck staff conduct most sampling on the Garrison reach and Lake Oahe.

Recommendation:

The surveys conducted under Study 1 should continue in order to provide sound, scientific management of the fisheries of the Missouri River System.

STUDY NUMBER 2: Aquatic Investigations of Lakes, Rivers, and Impoundments North Dakota

Adequacy:

The objective of Study 2 is to sustain and enhance a diverse recreational fishery for the enjoyment of the angling public while maintaining a viable native fish community. Surveys conducted under Study 2 collect information on fish populations throughout the state of North Dakota, including but not limited to: relative abundance, mortality, reproduction, growth, species composition, food habits, and forage abundance. Analysis of the data collected under this study has supplied the information needed to rationally and efficiently manage the lake and river fisheries of North Dakota.

Necessity:

Lakes, rivers, and impoundments provide locally-important recreational opportunities for the citizens of North Dakota, as well as for non-residents who visit the state. The total number of managed fisheries throughout the state depends on water levels, and increased dramatically in the 1990s due to unprecedented precipitation.

The jobs under Study 2 provide much of the data needed for scientific fisheries management. Extensive and intensive surveys are needed to determine appropriate stocking rates, evaluate hatchery plants, formulate fishing regulations, select possible sport/forage fish and invertebrates for introduction, develop water level recommendations and consider potential aquatic habitat improvements. In addition, water quality sampling is ongoing and fish habitat is periodically defined and identified.

Reliability:

The North Dakota Game and Fish Department has developed standard sampling guidelines for adult fish populations and for assessing forage and fish reproduction. These sampling guidelines standardize gear, effort, and locations on specific water bodies. Standard sampling surveys provide reliable information on fish population trends that can be compared across years or, in some cases, among waters. These trend data are used for determining management objectives, and evaluating the success of management actions on specific waters or groups of waters.

Efficiency:

As the number of managed water bodies increased in the 1990s, a lake priority score was assigned to each lake based on numerous parameters ranging from public use to water quality. This lake priority score separates lakes into three tiers to determine the amount of effort staff should put forth to manage them. Tier 1 and tier 2 lakes receive the most survey and management attention, while tier 3 waters are sampled and managed as-needed.

To facilitate efficient use of resources, lake management plans have been developed for several tier 1 and 2 waters. Our goal is to develop or update management plans for all tier 1 and 2 waters over the next three years. Lake management plans specify management objectives for key sportfish populations, and dictate the parameters to be measured during standard sampling.

All data collected during standard surveys of state waters are entered into a computer database. This database makes record handling and storage efficient, and facilitates the extraction and analysis of those data.

Recommendation:

Surveys conducted under Study 2 should continue in order to provide scientific management of fish populations in our lakes, rivers and impoundments statewide.

### STUDY NUMBER 3: Aquatic Investigations of Devils Lake in North Dakota

#### Adequacy:

Devils Lake is valuable to the people of North Dakota from both a recreational fishery and economic standpoint, receiving over a million angler-hours of use annually from open water and ice anglers. It is also a major destination of non-resident anglers and supports numerous fishing tournaments. Direct and indirect expenditures for recreation on Devils Lake comprise a significant part of the economy of the region. Our objective is to sustain and enhance a diverse fishery in Devils Lake for the enjoyment of the public.

Devils Lake has an interesting forage base in its amphipod (a.k.a. “scud” or “freshwater shrimp”) population. Scuds are a critical food item for the gamefish in the lake, and water quality is a critical element to their sustainability and to the fish community.

#### Necessity:

Devils Lake expanded significantly over the last decade in response to wet conditions throughout the basin. Likewise, the fishery has expanded into new and productive habitats, and has garnered the attention of anglers nationwide. A continued increase will place additional demands on the fishery resource. Devils Lake is also an important source of fish eggs for culture and stocking statewide. In recent years, most of the walleye and northern pike eggs collected by our department came from Devils Lake.

Scientific fisheries management is required to respond to increases in angling pressure and attention, to sustain the quality and integrity of the Devils Lake fishery. Components of scientific fisheries management include management planning, fish population sampling, water quality and habitat monitoring, and preventing aquatic invasive species from entering the lake. All of these are conducted under Study 3.

#### Reliability:

A standard sampling program is conducted annually on Devils Lake, utilizing standard sampling sites at the same time each year. As the lake grew in size over the last decade, the sampling program expanded correspondingly. Standard sampling includes adult population sampling and fall sampling to gauge reproductive success. Data from these surveys provide valuable information on trends in population dynamics and reproduction for game fish in Devils Lake. Recently, a pilot project has been initiated to devise a sampling program to track trends in the

amphipod population, the most important prey item in Devils Lake.

Efficiency:

The Devils Lake fishery is managed by department staff located in the Devils Lake District office, a proximally ideal location. A fisheries management plan is being drafted for Devils Lake, and a standard sampling program is already in place. This management plan and sampling program will ensure efficient, scientific management of the Devils Lake fishery.

Recommendations:

Due to the importance of the Devils Lake fishery to the anglers of North Dakota and the local economy, Study 3 should continue in order to sustain and enhance a diverse fishery in Devils Lake for the enjoyment of the public.

## STUDY NUMBER 4: Creel Surveys of Selected North Dakota Water Bodies

### Adequacy:

Creel surveys have provided defensible data, including estimates of fishing pressure, catch and harvest rates, and biological information (e.g., length distribution) of targeted fish species. This information complements fish population data and assists in determining management actions for water bodies surveyed under Studies 1-3. On large water bodies with multiple access sites, creel survey information helps the Department to prioritize access site development and maintenance by tracking use statistics for specific access sites.

In addition to fish population and harvest data, creel surveys provide information on angling pressure, which factors in to the prioritization of water bodies for management activities. Information on angling pressure can also be used to estimate the economic importance of sport fisheries to local and state economies.

### Necessity:

Anglers are one of the primary components of any sport fishery. Thus, in order to properly manage sport fisheries around the state, it's important to gather information on harvest and angler attitudes for specific fisheries.

Creel surveys are designed and conducted to assess the impacts anglers have on select fisheries. A creel survey is the best method of gathering accurate data on use and sport fish harvest for respective water bodies. Also this information is useful in comparing benefits between recreational fishing and other consumptive and non-consumptive uses.

Information collected from creel surveys will be very beneficial in establishing special regulations, adjusting stocking rates, and developing water level/ storage recommendations. Finally, creel surveys are a means to collect information on angler attitudes and expectations, which are considered when formulating fisheries management plans.

### Reliability:

Creel surveys are conducted using up-to-date, scientifically accepted methodology. In some cases, survey methods are standardized to ensure that the information collected will be comparable across years or among water bodies.

Under Study 4, creel surveys are conducted to provide angling pressure and harvest information to complement the information gathered in Studies 1-3. Creel surveys are conducted on the Missouri River system (Study 1) and Devils Lake (Study 3) every third year. During years when creel surveys aren't conducted on those waters, surveys are conducted on waters that fall under Study 2. Selection of those waters is based on the need to answer specific management questions, or to gather angler attitude information about that water.

Efficiency:

The Department lacks the personnel or staff time to coordinate large-scale creel surveys, so all creel surveys are contracted out to a private firm. With input from the Department, the contractor designs surveys, coordinates creel clerks, collects the data, and provides Department staff with updates on survey statistics. At the completion of each survey, the contractor provides a summary of results and collaborates with Department staff to interpret those results and produce a final report.

Recommendation:

Creel surveys should continue to be conducted on waters statewide to provide reliable information on angling pressure, catch and harvest statistics, and biological information of fish caught for select waters.

## STUDY 5: Angler Questionnaire

### Adequacy:

The objective of Study 5 is to obtain reliable information from voluntary angler respondents to phone and/or mail questionnaires that will aid in formulating fishery management policies, practices, regulations, and water resource development. An angler questionnaire has been administered annually to obtain the desired information.

The information obtained from angler response on the sport fish industry and other associated activities has provided reliable harvest, angler-day use and economic estimates of the fisheries resources. It also aids in determining angler needs in relation to development of additional fishing waters, improvements of available waters, seasonal access problems and other support facilities. Angler response to phone and/or mail questionnaires provides comparable data from year to year and over longer periods of time necessary in fishery research and development. It also provides a mechanism for supplying the information needed in making administrative decisions on the economics of the sport fishery in North Dakota.

### Necessity:

It has become increasingly important for the Game and Fish Department to provide current information on the fishery in order to be economically competitive with other user groups. This information is necessary for establishing effective regulations and carrying out intelligent management programs. Current and reliable harvest, angler preference and angler distribution estimates are needed to supplement data compiled under Study 2 in facilitating statewide "water resource planning". On-site surveys, as those carried out under Study 4, only provide angler attitudes at that specific site. To gather reliable information on angler preferences statewide, mail and telephone surveys are necessary. Despite the limitations of data from voluntary mail and personal telephone contacts, these methods are the only possible means by which such information can be obtained with our present staff and funds. In addition, beginning in 2001-02 a darkhouse spearfishing season was initiated. In order to ascertain the successes or failures of this new sport, anglers are required to register. This database is then used for a survey of all darkhouse spearfishers.

### Reliability:

Conducting an angler questionnaire gives the ability to poll a large number of anglers over the entire state. Sample sizes often exceed 2,000 anglers interviewed. Also, darkhouse spearing

remains a small component of our angling clientele. Requiring all darkhouse spearfishers to be registered with the Department has allowed a comprehensive survey of the group.

Efficiency:

The Department lacks the personnel or staff time to coordinate large-scale angler surveys, so all surveys are contracted out to a private firm. With input from the Department, the contractor designs and conducts the surveys. At the completion of each survey, the contractor provides a summary of results and Department staff interpret those results and distribute them Department-wide for other staff members to use.

Recommendation:

Angler surveys provide very useful data on angler expectations and preferences, and should continue to be conducted annually.