LAKE POWELL FISHERIES INVESTIGATIONS

Annual Performance Report

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Sport Fish Restoration Act

Project F-46-R-7

May 1, 1991 - April 30, 1992

Utah Department of Natural Resources
DIVISION OF WILDLIFE RESOURCES
1596 West North Temple
Salt Lake City, UT 84116

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Director

1991
ANNUAL PERFORMANCE REPORT

State: UTAH
Fisheries

Project Title: Lake Powell

Investigations

Project Number: F-46-R

Segment Number: 7

Study Number: I

Study Title: Forage Condition Study

Period Covered: May 1, 1991 - April 30, 1992

Study Objective: To (1) assess annual levels of threadfin shad reproduction through meter net tows in the backs of canyons (2) assess recruitment of young-of-year (yoy) threadfin shad into the pelagic zones of Lake Powell through midwater trawling and SONAR; (3) evaluate changes in threadfin shad (Dorosoma petenense) population levels resulting from striped bass (Morone saxatilis) predation; (4) collect other pertinent information relating to threadfin shad and other forage species in Lake Powell. Areas of interest may include age, growth, spawning, fecundity, sexual maturity, food preferences, causes of mortality and mortality rates.

Segment Objectives:

1. Monitor threadfin shad reproduction in the backs of canyons using standardized ichthyoplankton sampling techniques.
2. Monitor recruitment of yoy threadfin shad into the pelagic zones of the lake using standardized midwater trawling techniques and SONAR.
3. Disseminate study findings by scientific publications and presentations where appropriate.

Procedures:

1. Assess threadfin shad reproduction using standard ichthyoplankton meter net tows conducted at lower lake sites (Wahweap Creek, Warm Creek and Navajo Canyon) and midlake sites (Bullfrog Creek and Hall's Creek). Ichthyoplankton netting will begin in May as water temperatures approach spawning requirements for

threadfin shad. Sampling will continue through September by which time spawning has ceased. Larval shad will be enumerated and length measurements taken. An annual production indices will be developed.

2. Standard midwater trawling techniques and SONAR transects will be used to follow population dynamics of yoy threadfin shad. Three standard tows will be performed each sample night at Wahweap Bay, Bullfrog Bay and Good Hope Bay. Data will be collected during the dark of the moon, on three consecutive nights in July, August and September. Data results will allow annual comparisons of Lake Powell's pelagic shad populations.

3. Study findings will be distributed in scientific publications as appropriate.

Progress: The collection of information on shad production, recruitment, and relative abundance was completed as scheduled between May and September 1991. The data were summarized and compared with trends established in previous years. A population peak was noted for the first time since 1984. Shad abundance was greater than seen in 1984 but less than 1981. Some shad winterkill was noted in January and February 1992 due to low lake levels and cold temperatures.

Prepared by: Wayne Gustaveson and Georg Blommer

Date: April 15, 1992

1991
ANNUAL PERFORMANCE REPORT

State: UTAH
Fisheries

Project Title: Lake Powell Investigation

Project Number: F-46-R

Segment Number: 7

Study Number: II

Study Title: Measurement of Fishery Harvest, Pressure and Success

Period Covered: May 1, 1991 - April 30, 1992

Study Objective: To determine the magnitude and nature of fishing harvest, pressure and success through creel census.

Segment Objectives:

1. To conduct an interview program of Lake Powell anglers and subsequently obtain a measure of fishing success.
2. To estimate seasonal pressure using National Park Service boat-use figures and data obtained from creel census interviews.
3. To collect biological data related to angling harvest.
4. To summarize and analyze data and create a creel data base for future use.
5. To prepare and present data in scientific publications and/or meetings as the data warrants.

Procedures:

1. A lakewide creel census program will be conducted inclusive of all major launching sites (Wahweap, Hall's Crossing, Bullfrog Bay and Hite). Surveys will begin in April and continue through September. Catch rates for each species will be determined from angler interviews as they return to launching ramps and other access points.
2. Pressure estimates or indices will be obtained from instantaneous boat trailer counts made by the National Park Service for each access area. The ratio of

fishing to nonfishing parties, mean trip length and mean number of anglers/boat will be determined from interviews at launching ramps.

3. Biological data will be collected in conjunction with the census at all areas. These data will include: species composition, stomach contents for food habits analysis, scales and length-weight data for age and growth analysis. Weight data will also be used to estimated kilograms of each species harvest.

4. Comparisons of fishing pressure estimates and angler success will be made between reservoir areas and in relation to past years.

5. If data warrant, manuscripts will be prepared and presentations via Division bulletin or other scientific publication will be made.

Progress: The creel survey of anglers using Lake Powell was completed as scheduled during April to October 1991. The data was analyzed using a SAS program loaded on the Lake Powell Project PC. Biological data from harvested fish was loaded into a Lake Powell fish data base using the Enable program.
Visitation and fishing pressure were at an all time high in 1991. The angler success rate in fish per hour was 0.2 which is below the historic average of 0.41. Striped bass and channel catfish were harvested most often followed by smallmouth and then largemouth bass. Angling pressure was highest in the spring and fall while catch rate was highest in August at the time of minimum angler use. Angling pressure was directed to areas of recent success by a regularly updated recorded message on a toll free telephone line accessed anywhere in the U. S.

Prepared by: Wayne Gustaveson and Louis Berg

Date: April 15, 1992

1991
ANNUAL PERFORMANCE REPORT

State: Utah Fisheries

Project Title: Lake Powell Investigation

Project Number: F-46-R

Segment Number: 7

Study Number: III

Study Title: Index to Annual Fish Population Trends

Period Covered: May 1, 1991 - April 30, 1992

Study Objective: To develop reliable indices of game fish population trends.

Segment Objectives:

1. To set gill nets at four stations on the reservoir (Padre Bay, San Juan between Cha and Trail Canyons, Rincon and Good Hope Bay) during the month of March; and to use the data collected as indices of population trends.

2. To conduct a standardized sampling program of electrofishing on Lake Powell to supplement data obtained through gill netting.

3. To compute catch rates and determine trends in numbers for each species.

Procedures:

1. Gill netting with ten 30.5 m (100 ft.) experimental gill nets will be conducted during March at four stations (Padre Bay, San Juan between Trail and Cha Canyons, Rincon and Good Hope Bay). The nets will be set at each station for two consecutive days. Fish will be removed at 24-hour intervals.

2. A scheduled electrofishing program will be conducted during the month of September at five stations (Rincon, Stanton Creek, Warm Creek, Good Hope Bay and the San Juan arm). Sampling will be done in similar shoreline habitat and effort will consist of 1 hour actual electrofishing time. Total length of a representative sample of each species captured will be recorded.

3. Catch rates and length frequencies by species will be determined for fish collected by both gill netting and electrofishing. Comparisons between areas, species and years will be made to describe population dynamics.

Progress: Trend gill netting was completed during March 1992. Virtually all species, except striped bass, were caught at a higher rate than the previous year. The developing smallmouth bass population was sampled at a new high level of abundance. All species of fish sampled were found to be in excellent physical condition. The electrofishing survey was completed successfully during September 1991.

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Date: April 15, 1992

1991
ANNUAL PERFORMANCE REPORT

State: UTAH Fisheries

Project Title: Lake Powell Investigation

Project Number: F-46-R

Segment Number: 7

Study Number: IV

Study Title: Striped Bass Population Development

Period Covered: May 1, 1991 - April 30, 1992

Study Objective: To monitor striped bass populations and assess biological interactions and impacts within the striped bass population and on other fishes in Lake Powell.

Segment Objective:

1. Collect data concerning food habits, growth characteristics, physical condition, geographic distribution and movement and quality of the sport fishery.
2. Determine staging and spawning sites and movement between the two.
3. Determine recruitment and year class strength.

Procedures:

1. Striped bass will be collected on a regular basis with gill net sampling, creel census and angling techniques. Fish sacrificed during sampling will be weighed and measured with scales taken for age and growth determinations. Stomachs will be analyzed in the field with contents quantified on percent occurrence basis. Physical condition (K_{fl}) will be monitored throughout the sampling season.
2. Spawning movements will be monitored during the expected spawning/staging period (April-June). Gonadal development will be assessed in adult fish. Time and duration of spawning will be determined by collection of ripe

and spent fish.

3. Reproductive success and distribution of yoy will be determined during regular electrofishing sampling and fall gill netting.

4. Recruitment of yearling and older fish will be measured during standardized fall gill net sampling (November) at four sampling stations (Wahweap, Good Hope Bay, Rincon and San Juan Arm).

Progress: The striped bass population was monitored throughout the year and found to dramatically improve in physical condition in response to the increase in threadfin shad abundance. The historic spawning run to Glen Canyon Dam failed to materialize in April-May 1991. No spawning/staging areas were detected. The lake record for sport caught striped bass was broken three times during May indicating trophy fish were actively moving to spawning areas. Fall gill netting completed in November confirmed that numbers of adult striped bass were at the lowest levels recorded during recent years. Numbers of striped bass were low throughout the lake with the exception of the lower lake where a record number of young-of-year were sampled. The population mix sampled in 1991 closely resembles the population structure seen in 1981 just prior to the first major decline in striped bass physical condition.

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Date: April 15, 1992

1991
ANNUAL PERFORMANCE REPORT

State: UTAH Fisheries

Project Title: Lake Powell Investigation

Project Number: F-46-R

Segment Number: 7

Study Number: V

Study Title: Smallmouth Bass Population Development

Period Covered: May 1, 1991 - April 30, 1992

Study Objective: To monitor smallmouth bass populations and assess biological interactions, success of the introduction and the resulting sport fishery.

Segment Objectives:

1. Collect smallmouth bass life history data including age and growth, physical condition, food habits and distribution.
2. Examine habitat partitioning by smallmouth and largemouth bass in representative lake locations. Various sampling techniques will be evaluated to determine best method and periodicity for examining habitat preference and overlap for smallmouth and largemouth bass.
3. Collect yoy during electrofishing survey to establish relative abundance trends for comparison among years and lake areas.
4. Collect evidence of smallmouth range expansion and distribution within the lake.

Procedures:

1. Data collected during existing sampling (Studies II, III and IV) will be used to obtain as much information as possible about the life history and adaptation of smallmouth bass to Lake Powell's unique environment.
2. Habitat preference and overlap for smallmouth and largemouth bass will be determined using various techniques including electrofishing, seining,

snorkeling and angling.

3. Smallmouth bass yoy will be collected with electrofishing equipment at points of introduction with population abundance compared to areas where no stocking has occurred to determine lakewide smallmouth bass distribution.

4. Random and standardized gill net sampling will be used in conjunction with angler reports and other information to determine smallmouth bass distribution and speed of range expansion within Lake Powell.

Progress: All smallmouth bass data collected during sampling on Lake Powell was tabulated and entered in the Lake Powell data base using the Enable program on the Project PC. The population is firmly established and relative abundance of adult smallmouth bass was two to four times greater at all standard sampling areas compared to preceding years. Smallmouth bass were caught by anglers in greater numbers than largemouth bass for the first time. The catch rate was equal to striped bass catch although more smallmouth were released than striped bass.

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