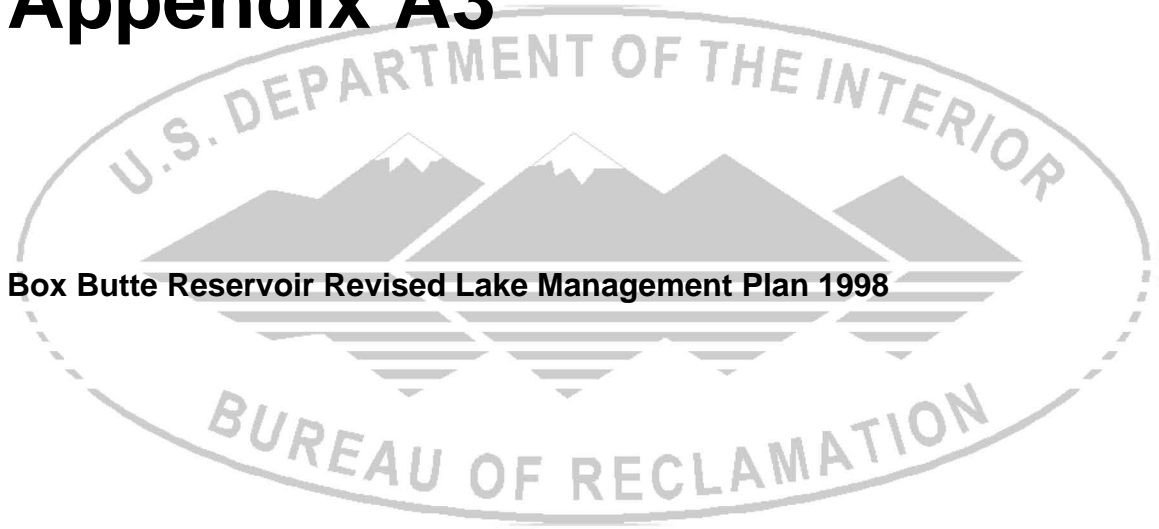


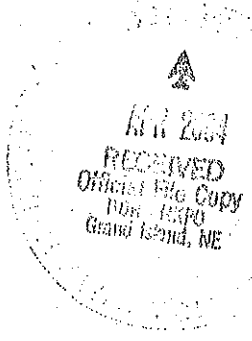
# Appendix A3



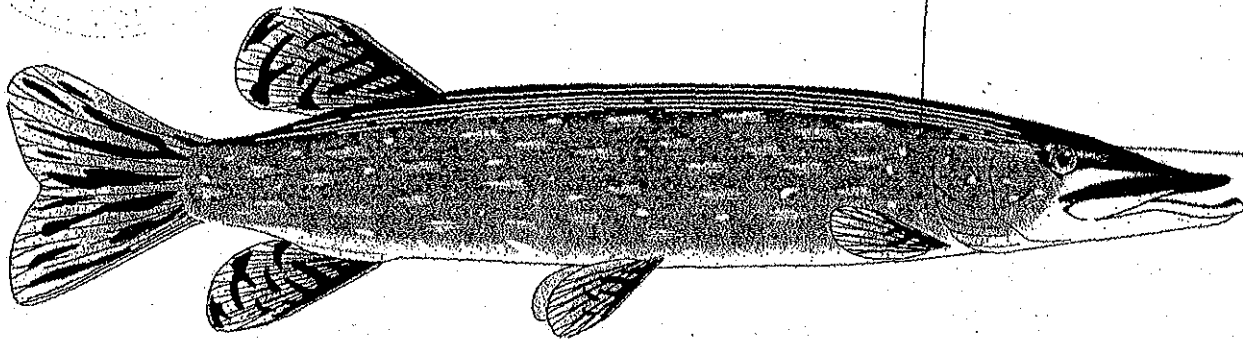
**Box Butte Reservoir Revised Lake Management Plan 1998**

# BOX BUTTE RESERVOIR

## REVISED LAKE MANAGEMENT PLAN



NAME	INITIAL	ACTION	DATE
Steve	AN		4/26
Ray			
Mike D.			
McCook		Its only	4/26
REMARKS:			



Prepared by  
**Jack Peterson, Fisheries Supervisor**  
 District I Fisheries Division  
 September 1998

Nebraska Game and Parks Commission  
 Rex Amack, Director  
 Kirk Nelson, Assistant Director  
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## I. Introduction:

Box Butte Reservoir located in Dawes County approximately nine miles north of Hemingford, Nebraska was constructed in the 1940's under the supervision of the United States Corps of Engineers. It dams the Niobrara River which has its origin in southeast Wyoming approximately 60 miles to the northwest. The reservoir and dam were designed for flood control, irrigation and recreation. Recreation is managed by the Nebraska Game and Parks Commission and irrigation is managed by the Mirage Flats Irrigation District both under the supervision of the Bureau of Reclamation.

## II. Historical Fisheries Information:

The first introduction of fish was made on May 23, 1942 when 7,820 3-6 inch bluegill were stocked. From the initial stocking until 1963 a variety of species were stocked including large numbers of brown and rainbow trout. These species did well in the reservoir since there were no severe draw-downs and the reservoir contained enough water to be considered "trout supporting". Other early day fish species stocked were largemouth bass, yellow perch, bullhead, drum, crappie, walleye, channel catfish, northern pike and white bass.

The fishery remained fairly good until the early 1960's. Sampling during this period indicated that the carp were becoming quite numerous and were in the process of taking over the reservoir. In addition, the freshwater drum that had been stocked earlier were becoming stunted.

It was determined that the only way to improve the fishery was to renovate the reservoir and the 125 miles of Niobrara River above. In September 1965 the renovation was carried out using 495 gallons of liquid rotenone on the river and 5335 gallons on the reservoir. This was a treatment of 2.0 p.p.m. Eight thousand acre feet of water had been left in the reservoir. From the time of construction until 1965 the reservoir nearly always had a minimum of eight thousand acre feet left in the fall after the summer irrigation demand.

Restocking of the renovated reservoir started shortly after the water detoxified. The first stocking was on October 20, 1965 when 17,208 3-5 inch largemouth bass were introduced. Stocking continued through that fall and spring of 1966. Other species included redear sunfish, channel catfish, smallmouth bass, white bass, walleye and northern pike. The Niobrara River above the reservoir to the Wyoming state line was restocked with brown and rainbow trout.

Post renovation sampling in the reservoir in 1967 indicated several positive aspects had occurred. First of all, the restocked species were growing exceptionally well. Second, no carp had been found in nearly two years. The last positive aspect was that a number of brown and rainbow trout that had been stocked in the river above had migrated into the reservoir and had grown phenomenally. These fish had been stocked in the river as 6-7 inch fish in October, 1965 following the renovation. They were found in the reservoir in September, 1967 as 16-20 inch fish and weighed between 2-4 pounds. Because of this, the Game and Parks Commission went

into a crash program of stocking both brown and rainbow trout directly into the reservoir. Large numbers of these two species were stocked from 1968 through 1972. Two problems occurred during this period that made this program a failure. The first was that the warmwater species that had been stocked following the renovation were getting to the size that they were competing with the trout for food and space. The second, and by far the most critical, was that the reservoir was being drawn down lower than ever before. From 1946 until 1968 (23 years) the amount of water left in the reservoir in the fall following the summer irrigation demand averaged well over 8,000 acre-feet. Starting in 1969 and continuing through 1989 (21 years) there was never more than 7,000 acre-feet left in the reservoir with the average at the end of the irrigation season being only 2328 acre-feet for this period (Table 1). This, of course, eliminated the trout supporting water and the reservoir became strictly a warmwater fishery. Even though the trout stocking program turned out to be a failure, there was one positive aspect in that there were quite a few quality trout caught from 1966 to 1970.

One can only speculate as to why the reservoir has not had adequate water over the past 28 years. Some feel that good conservation practices on the watershed prevented the large runoffs and floods that the river used to experience. Others feel that all of the center pivots that were put in on the drainage starting in the early 1970's had an effect on the flow in the river. Still others feel that we have simply been in a dry cycle. It is probably a combination of all three! Flow data from the river on all three recording stations from the past 30 years was sent to Brad Newcomb several years ago to see if there was a significant reduction. When Brad ran the data on his computer his conclusion was that statistically there was none!

Starting in 1969 and continuing through 1989, Box Butte Reservoir had been difficult to manage from a fishery aspect because of the severe draw-downs (Table 1). Compounding the problem was the period of time in which this occurs. Most of the dewatering occurred during a two-month period (Table 2). This causes a serious flushing effect on the fish population.

In 1990 an agreement between the Nebraska Game and Parks Commission, the Mirage Flats Irrigation District and the Bureau of Reclamation was signed into effect (See Attachments). This limited the amount of water that could be used for irrigation. Prior to this agreement Box Butte Reservoir suffered the most severe draw-downs of any reservoir in the State of Nebraska. After spending many years salvaging fish below the dam after the water had been shut off it was concluded that most fish loss occurs when the lake elevation reaches 3977 msl and below. This agreement restricted the Irrigation District from lowering the water level below elevation 3978 msl. In return for this agreement the Game and Parks Commission agreed to pay the Irrigation District for that amount of water they could have used for irrigation. This agreement will last for a period of thirty years.

The problem of major draw-downs is not uncommon with that of other irrigation storage reservoirs but because of the severity Box Butte Reservoir experiences, this agreement was implemented. According to data collected in 1988 for another project most reservoirs in the State of Nebraska will spill less than half of their total pool for irrigation in one season.

However, Box Butte Reservoir had in the past years utilized over 90% (Table 3). To compound this problem, water loss occurs in approximately two months time causing a tremendous flushing effect on the reservoir's existing fish population (Table 2). Fishery personnel from the Game and Parks Commission determined that to build up a fish population the reservoir must not be drawn below elevation 3977 msl for three consecutive years. During the period from 1964 to 1984 the reservoir has remained above this elevation for three consecutive years only once (Table 1). In 1985 following three years above this elevation Box Butte Reservoir was once again drawn down well below elevation 3977 msl. The result was the greatest fish loss in the last twenty years, when 28,262 game fish were salvaged in the river and returned to the reservoir. These fish ranged in size from 1-2 inch bluegill and yellow perch to northern pike up to 18 inches and largemouth bass to 16 inches. It is unknown how many were not salvaged and lost down river.

During the period 1972 through 1997 stocking has been restricted to warmwater species.

### III. Current Fisheries Information:

Gizzard shad were first introduced as adults in 1978 and on an annual basis starting in 1981. When this species was first introduced it was felt that they were not providing much prey due to the low numbers that over-winter in the reservoir. Collecting stomach samples from predator fish during a partial survey in the summer of 1988 indicated young-of-the-year gizzard shad were being utilized. It was concluded that the stocked adults do get off a good spawn and the progeny was being used by the predators for forage. The problem is the high over-winter mortality rate on the stocked adults. It was determined from fall sampling both in years when shad had been stocked in the lake and also years when they had not that to provide enough young-of-the-year gizzard shad for forage, adults would have to be stocked every year. Thus the stocking of adult shad was eventually discontinued. It was also felt that we could achieve the same results using panfish and also gain another sport fish. Both growth and Wr of the northern pike have dropped slightly since shad stocking was discontinued, however, one can only speculate on the reason. There are numerous yoy fish of various species available for forage.

Bluegill were first introduced following the renovation in 1981 when 39,000 1-2 inch fish were stocked in the fall. Another stocking was made in 1988 when 63,000 1-2 inch fish were stocked in the spring. Additional stockings were made in 1990 - 93,000, 1992 - 103,000, 1994 - 78,000, and 1997 - 80,000. This species of fish is usually not noted as a reservoir species, however, these stockings have provided another species for anglers to harvest plus additional prey for the predators. Reproduction has been very limited as draw-downs usually occur during bluegill spawning thus limiting the year class strength. No bluegill were collected in 1997 due to the large numbers of scales collected from other species. This will be the target species for 1998 sampling. Management plans at this time are to discontinue further bluegill stockings until we get more data from the 1998 sampling.

Northern pike were stocked the spring following the 1965 fall renovation and again the following spring (1967). Both stockings were made with fingerling fish. The fish grew exceptionally well as do most species in a new or renovated lake. It was felt at the time of stocking that this species

would have little long-term effect on the reservoir since it could be controlled through stocking. Most large reservoirs have very limited pike spawning habitat hence a very limited population of northerns. Box Butte Reservoir became the exception. Once the carp were eliminated large quantities of submerged aquatic vegetation started to appear. As the reservoir water level was lowered during the irrigation period, large mats of this vegetation (mainly chara) were left high and dry on the banks. Instead of decomposing these mats stayed intact and as water flooded back over them during the filling period (winter months) they became excellent spawning habitat for the early spring spawning northern pike. As a result the reservoir has a good population of this species. Management of the harvest of this species was attempted in January, 1986 when a 24 inch size limit was imposed. The strategy was to build up a population of bigger fish since most fishermen were keeping anything they caught that was bigger than 14 inches. Compliance with the regulation was excellent but the results were completely different from what we had hoped for. Sampling the spawning population using frame nets in March, 1988 collected 288 fish. All were under the legal limit of 24 inches except for one fish. The one legal sized fish was 24.1 inches long. It appeared that the minute a fish reached legal size it was harvested, so instead of building up a population of fish that were quality size we were building up a large population of fish under 24 inches. This put a strain on the prey base in the reservoir which meant decreasing the number of bluegill, yellow perch and rock bass; and these are the species that the majority of the people come to the reservoir to fish for. Consequently, this size limit was removed on January 1, 1990. Sampling in 1997 indicated that the age structure of the northern pike had improved from the pre size limit era. Sampling in 1985 indicated that 93% of the sampled population consisted of age groups I and II fish with the remaining 7% being age group III. Data collected in 1997 indicated that 54% of the sampled fish were age group I and II while age groups III and IV made up 40%. Just over 2% were age V and older. At the present time there are some people that want this lake managed as a trophy northern pike lake. This could probably be achieved with a slot limit. Even though some states have not had much effect on pike populations using slot limits I feel that we could at Box Butte Reservoir. The question is are we willing to sacrifice the panfish population to achieve it? If we were to put in a slot limit with a non-harvest slot from 20-30 inches we would be protecting fish from 2½ years old to 6½ years old. To protect a pike population for 4 years would be at the expense of large number of panfish unless a high percentage of them were harvested prior to the protected slot. During our 1997 sampling we collected 2 large pike in the 156 fish collected. Although no population estimate has ever been attempted on Box Butte Reservoir it is assumed that the total northern pike population excluding young-of-the-year fish is in the neighborhood of 4000 fish (this is only a supposition based on conjecture). If this is true then our sample of 156 fish was approximately 4% of the total population. If our sample was an indication of the size range of the total population this would suggest that there are 52 "memorable" pike in the lake. This would indicate that this lake does now have a quality fishery and to change management schemes could seriously endanger the quality and quantity of the panfish fishery the lake now supports. The other fact is that this reservoir was renovated nearly thirty-five years ago to remove among other species a high population of carp. We must be doing something right as the present carp population remains very low. We need to study very carefully any drastic management change for this species and this reservoir.

Walleye were stocked in 1966, the year following the renovation and have been stocked intermittently since then. The stockings in 1966, 1969, 1970, 1971 and 1972 were small fish usually stocked in June. The 1982, 1983 and 1984 stockings were bigger fish but fewer numbers usually stocked in September. Stockings in 1986 and 1987 were 1 inch fish stocked in May while 1990, 1991 and 1992 were fry stocked in April. From 1993 until the present we have been stocking larger fish stocked in September. The bottom line is we have been trying all combinations with varying results. Since the agreement with Mirage Flats Irrigation District and the reservoir being fuller in September the chance of fall stockings survival should be greater. However we have documented good year class strengths when no fish were stocked and good year class strength when high numbers were stocked. We would like to continue a period of stocking large fish in the fall that have been fed a minnow diet in the hatchery. If this doesn't work we will try a period of non stocking. Our goal is to average 10 fish per gill net consistently in our fall sampling. Maybe this is impossible for a reservoir with a non-shad forage base. We do have a yellow perch population which is probably the next best thing for walleye prey. At the present time our catch rate is very erratic. In 1992 our catch per effort was 4.3 fish per net, in 1993 it was 14.5, in 1994 it was 6.6 and in 95, 96 and 97 it was so low that it wasn't sent in (less than 1.0). One of the reasons is that we sample this reservoir very late in the year (late October or early November) due to the high use of fishermen. We may start sampling in early October and improve the catch rate.

Yellow perch was not one of the original species stocked following the 1965 renovation. They started showing up in the sample in the mid 1970's. Since they are highly sought after as a pan fish plus an excellent prey species the population is quite cyclic. Sampling during the period when the 24 inch size limit on northern pike was in effect indicated that the population decreased as the pike population increased. This combined with the fact that large numbers of perch were lost each year through the outlet prior to 1990 caused a serious strain on this population. In fact by 1991 a year after the size limit was discontinued the perch population was so low that we stocked a million perch eggs to bolster the population. Sampling data indicates that this stocking or the removal of the pike size limit or something else has helped this population of fish as there have been strong year classes each year since 1991. It takes five growing seasons for a perch in Box Butte Reservoir to be 250 mm and 225 grams. This is rather slow growth but typical of the perch growth in this area. In 1997 as in other years large number of perch were harvested by fishermen all year long. Management strategies will be to keep good strong year classes through age group VI. This will probably have to be accomplished through northern pike management rather than fishermen harvest. Of the 226 fish collected during the 1997 sampling approximately 4% were older than V.

Largemouth bass were stocked shortly after the water in the reservoir detoxified following the September, 1965 renovation. They were stocked again in 1966 and then left to let natural reproduction keep up with the mortality rates. This worked out quite well until the reservoir began experiencing the drastic draw-downs in the early 1970's. Box Butte Reservoir is unique in that water diversion isn't usually started until around the first week in July. But once it starts it goes full bore until the first part of September. By then the reservoir has decreased its capacity

by about 85%. Largemouth bass because of their late spawning activity have actually just brought off a hatch when this draw-down starts. Thus when the draw-down is halted these young-of-the-year bass are concentrated with a large number of fish bigger than they are. This was a major problem prior to the 1990 agreement. It has been assumed for years that this is why the bass population is fairly low. Sampling this species has been difficult at best. In the spring the reservoir is full and the bass are in flooded timbers that is too deep to electro-fish. By the time the water is out of the flooded timber it is late July/early August the bass are in the deep part of the reservoir. We have never gotten enough bass in our sampling to give us a handle on the population. Growth is about average, taking five growing seasons to reach the legal harvest size of 380 mm. Several stockings have been made in an attempt to build up this population but no attempt has ever been made to evaluate them. Interviews with local fishermen have indicated that there is a fair population in the reservoir. However very rarely has a fish of master angler proportion come from Box Butte Reservoir. Management strategies at the present time include finding a better way to collect large numbers of this species so that we can get a handle on the existing population.

Smallmouth bass were introduced following the renovation. There have been no other stockings since the initial one. The population remains small as the habitat is also small. A few are harvested each year with an occasional one in the "master angler" category. In 1997 a local spearfisherman collected a state record smallmouth off the dam at the reservoir that weighed 5 pounds 12 ounces. No management plans are planned for this species.

Channel catfish were stocked as fingerlings following the 1965 renovation. In addition stockings of "shorts" were intermittently stocked in the 1970's and 1980's. Starting in 1991 until the present they have been stocked on an annual basis. This is another species that we know very little about. We assume that there is no natural reproduction in the reservoir but even this is unknown. The only time we gill net the reservoir is very late in the fall and usually we collect a few but we only take lengths and weights --- no age growth data. Fishermen do harvest some each year but numbers are unknown. A creel survey would help collect data on species such as this and largemouth bass. Management plans are to continue to stock approximately 1600 fish (1 per acre) each year until we can determine how much good stocking is doing. In addition spines will be collected to determine the age of the fish we collect in our sampling.

Rock bass is another species that were never stocked in the reservoir but probably came in with a load of bluegill from Rock Creek Fish Hatchery. At the present time they are doing quite well and providing lots of angler enjoyment to area fishermen. Each year a number of "master angler" awards for this species come from the reservoir. In addition the state record for underwater spearfishing came from here. Sampling in 1997 collected 291 fish of which 132 were aged. Data indicated a good balanced population with data being collected from fish up to and including age group VIII. Growth seems quite good with fish taking five growing seasons to reach eight inches



and a half pound. This is similar to bluegill growth in some of our good sandhill lakes. The management strategy at this time is only to monitor the population. Because of the way this species has responded to the reservoir environment it will probably cause us to discontinue our semi annual bluegill stocking.

Black crappie is another incidental species in the reservoir. They had been introduced prior to the renovation but had contributed little to the creel. They were never reintroduced but did start showing up in the mid 1980's in our sampling. They were probably introduced by a fisherman. At the present time there are a few remaining in the reservoir and could end up being out competed by the rock bass and bluegill. Sampling in 1997 collected only six fish. Growth rates are inconclusive because of the small sample size. Management plans will only include monitoring the population.

Redear sunfish, white bass, fathead minnows and golden shiners have all been introduced following the renovation but didn't do well in the Box Butte Reservoir environment for one reason or another thus there are no plans for any reintroduction. White suckers and carp are present in the reservoir but only in very few numbers. Both species when collected are usually "master angler" size fish. An interesting note is that the only carp that we have collected have been mirror carp. It appears that the game fish population is controlling the rough fish population quite well. For this reason alone, any drastic changes in management strategies should be very well thought out before they are made.

One other species in the reservoir that is worthy of mentioning is the European rudd. This fish was first noted in the reservoir in 1995 when an angler caught one on hook and line. Since that time they have become more numerous both being caught by fishermen and in our sampling. The only fish we have seen are adults in the 10-12 inch size range. What effect they will have on the fish population remains to be seen.

#### IV. Objectives:

The major objective was achieved in 1990 when an agreement between the Nebraska Game and Parks Commission, the Bureau of Reclamation and the Mirage Flats Irrigation District regulated the amount of water that can be drained from the reservoir. This agreement benefits both the fisheries and fishing and is for a period of 30 years. Monies paid by the Game and Parks Commission to the Mirage Flats Irrigation District as part of this agreement was to be used to reline some of the irrigation canals and thus improve the water delivery system. Personal communication with the district manager (September-1998) indicated that it is working very well. He also indicated that their new philosophy is to deliver 6 inches of water to all the land under contract each year. In past years (prior to the agreement) the policy was to deliver all the water in the reservoir each year. This meant some years they would get 12-14 inches on their fields and some years 3-4 inches. Under the new policy they should be able to deliver 6 inches with normal or slightly below normal inflow from the drainage above. However, if the area should suffer two consecutive dry years where the inflow is below normal, by the end of the

irrigation season on the second year the reservoir would be drawn down to the minimum pool on the agreement (3978.0 msl - 2829 acre feet). This new policy is greatly benefiting the reservoir. -- See chart in back of report and note acre feet remaining since the 1990 agreement.

Box Butte Reservoir is considered the highest quality fishing lake in the district. It averages nearly 60 master angler awards per year (92-96). In 1993 it was the top lake for yellow perch and rock bass awards and second for the most bluegill awards. There were also awards for northern pike, channel catfish and smallmouth bass. Our main objective now is to maintain this quality fishery through individual species management.

1. Northern Pike: For the time being leave things as they are. At the present time, according to the 1997 survey, just over 2% of the population is larger than 610 mm. If this could be increased to 6-8% it would improve the quality dramatically but could possibly cause problems. We will be looking into slot limits (20-30, maybe 18-26) and bag limit changes. We will be collecting more data especially creel and mortality to help determine a proper slot for this species in this reservoir.
2. Walleye: Sampling in the early 90's collected an average of 12 fish per gill net. This has fallen off to approximately one per net. Our objective is to consistently sample 10 fish per net during the fall sampling. We will be requesting walleye from the hatchery for fall stocking that should average 6" and have been fed a minnow diet. The rate will be at a rate of 2 per acre or 3,200 fish. This request will be for three consecutive years.
3. Yellow Perch: This is probably the most unstable population in the lake. Fishermen harvest them when they are barely 6 inches and they are a favorite prey of both northern and walleye. Our management goal is to maintain the quality of this fishery. This will have to be done through predator management such as slot limits on northern pike and/or adjusted bag limit. Master angler awards dropped from 48 in 1993 to 19 in 1996. This is a concern.
4. Channel Catfish: We actually have no objectives on this species. We assume that the annual stocking has enough survival to maintain the existing fishery. The problem is we don't know the existing fishery. A creel survey would greatly help in the management of this species as it would indicate how many anglers actually seek catfish in Box Butte Reservoir. Our management goal is to find out what we actually have for a population.
5. Rock bass: At the present time the reservoir supports a good balanced population that provides some quality fishing to a large number of anglers. Sampling this population indicated over 10 percent of the fish collected had been in the reservoir more than six growing seasons. Age-growth data indicated a better than average

growth rate. Our management goal is to maintain this structure. One concern is "is there competition between rock bass and bluegill". In 1998 we will be collecting data on the bluegill population.

6. Bluegill: Objectives will be determined following the 1998 sampling period. Our plan at this time is to discontinue the bluegill stocking for the time being. The management goal at the present time is to find out what kind of a population we actually have.
7. Largemouth bass: The major management goal for this species is to find a better way to evaluate the population. Possibly a new electro-fishing boat will help.

#### V. Objectives:

Plans are to sample the reservoir in 1998 concentrating on collecting bluegill and northern pike data. Data from other species will also be collected but scales will only be collected from bluegill. If we collect scales from all species each year it involves pressing and reading of approximately 550 scales and this take too much time. We feel that we will still be able to catch any population shifts by collecting scales on an every other year basis.

Northern pike management will not change from what we are doing now unless a suitable slot limit can be determined that will better fit our management needs. This would include improving the quality of the pike while not negatively effecting the panfish population. Stockings will continue on both channel catfish and walleye but attempts will be made to evaluate them. No stockings of bluegill will be made until more data is collected and the population is better understood. This means no stocking until at least 2000.

We will continue to monitor the carp and sucker population. These species have not been a problem since the renovation and are not anticipated to be one now. In all of our sampling we have yet to collect a small carp or sucker. Recruitment is very low.

Electro-fishing in Box Butte Reservoir has always been a problem; perhaps the addition of a new electro-fishing boat to our fleet will help with it.

#### VI. Summary:

The agreement between Mirage Flats Irrigation District, the Bureau of Reclamation and the Game and Parks Commission has been a windfall for this reservoir. Not only has fishing improved, but the people are able to now enjoy the lake the entire year. The fish population remains fairly stable. Most species are growing at an average or above average rate and the rough fish population remains very low. For a lake that was once called a "mud hole" each August and September a few short years ago, we have come a long way!

#### VII. Appendix:

See attached tables.

<u>Date</u> <u>Stocked</u>	<u>Species</u>	<u>Size</u>	<u>Number</u>	<u>Source</u>
8/27/85	Bluegill	6-10"; 1"	2,300	Niobrara River
8/27/85	Black Crappie	6-10"; 1"	1,100	Niobrara River
8/27/85	Yellow Perch	1-3"; 3-8"	8,200	Niobrara River
8/27/85	Walleye	6-18"	50	Niobrara River
9/9/85	Northern Pike	4-18"	114	Niobrara River
9/9/85	Largemouth Bass	3-10"	31	Niobrara River
9/9/85	Smallmouth Bass	3"	2	Niobrara River
9/9/85	Bluegill	1-2"	1,200	Niobrara River
9/9/85	Bluegill	3-7"	500	Niobrara River
9/9/85	Black Crappie	1-2"	1,200	Niobrara River
9/9/85	Black Crappie	3-7"	50	Niobrara River
9/9/85	Yellow Perch	1-2"	12,000	Niobrara River
9/19/85	Northern Pike	6-18"	18	Niobrara River
9/19/85	Largemouth Bass	3-12"	14	Niobrara River
9/19/85	Walleye	6-8"	3	Niobrara River
11/6/85	Channel Catfish	12"	1	Private Salvage
11/6/85	Largemouth Bass	12-16"	17	Private Salvage
11/6/85	Largemouth Bass	4-8"	45	Private Salvage
11/6/85	Rock Bass	8.5"	1	Private Salvage
10/25/85	Northern Pike	6-17"	39	Niobrara River
10/25/85	Largemouth Bass	3-11"	14	Niobrara River
10/25/85	Yellow Perch	3-4"	24	Niobrara River
10/25/85	Walleye	3-4"	2	Niobrara River
10/25/85	Walleye	6-8"	12	Niobrara River
5/9/86	Gizzard Shad	Adult	500	Lake Maloney
5/28/86	Walleye	1"	100,000	NFSH
8/14/86	Channel Catfish	8-10"	4,750	State
9/12/86	Largemouth Bass	3"	12,670	VSH
5/12/87	Gizzard Shad	Adult	350	Lake Maloney
5/27/87	Walleye		100,000	NPSH
7/24/87	Channel Catfish		7,940	NPSH
9/4/87	Largemouth Bass	4"	12,912	VSH
9/14/87	Largemouth Bass	3"	6,080	VSH
3/29/88	Bluegill	1-2"	63,600	VSH
5/20/88	Gizzard Shad	7-14"	200	Wellfleet
7/7/88	Largemouth Bass	1.5"	13,135	VSH
7/7/88	Largemouth Bass	3"	243	VSH
7/7/88	Largemouth Bass	3.5"	100	VSH
10/17/88	Walleye	4-10"	94	Niobrara River
5/25/89	Gizzard Shad	Adult	130	Lake Maloney
3/19/90	Bluegill	½ - 1"	93,400	VSH
4/21/90	Walleye	Fry	472,500	NPSH
5/23/90	Gizzard Shad	Adult	150	Wellfleet
4/16/91	Walleye	Fry	500,000	NPSH
4/22/91	Yellow Perch	Eggs	1,012,500	VSH
6/11/91	Gizzard Shad	8"	300	Wellfleet
8/7/91	Channel Catfish		11,700	NPSH

<u>Date</u> <u>Stocked</u>	<u>Species</u>	<u>Size</u>	<u>Number</u>	<u>Source</u>
9/19/91	Black Crappie	2"	42	Can Below D
9/19/91	Rock Bass	8"	56	Dam Canal
9/19/91	Largemouth Bass	4"	81	Dam Canal
9/19/91	Bluegill	4"	33	Dam Canal
9/19/91	Yellow Perch	3"	867	Dam Canal
9/19/91	Walleye	13"	16	Dam Canal
3/24/92	Gizzard Shad	10-15"	120	Rock Creek
3/17/92	Bluegill	1"	50,000	VSH
4/15/92	Walleye	Fry	500,000	NPSH
8/4/92	Channel Catfish	6-9"	16,000	NPSH
9/28/92	Bluegill	1"	52,680	VSH
8/17/93	Channel Catfish	6-8"	16,873	NPSH
9/22/93	Walleye	4-6"	2,231	NPSH
9/22/93	Walleye	4-6"	2,809	NPSH
9/22/93	Walleye	4-6"	4,004	NPSH
9/22/93	Walleye	4-6"	2,292	NPSH
9/23/93	Walleye	4-6"	10,527	NPSH
9/23/93	Walleye	4-6"	3,120	NPSH
9/23/93	Walleye	4-6"	5,115	NPSH
9/23/93	Walleye	4-6"	9,169	NPSH
3/24/94	Bluegill	1"	78,000	RCSH
6/3/94	Walleye	1"	24,000	CAH
9/8/94	Channel Catfish	8.5"	3,236	VSH
9/13/94	Channel Catfish	8.5"	4,764	VSH
9/12/95	Walleye	4-8"	12,200	CAH
9/19/95	Channel Catfish	8-10"	8,000	NPSH
9/11/96	Channel Catfish	9-10"	3,200	
9/5/96	Walleye	3-4"	8,000	
3/24/97	Bluegill	5"	35,000	Rock Creek
3/26/97	Bluegill	1"	45,000	Valentine
8/26/97	Walleye	5.6"	7,500	Calamus
9/9/97	Channel Catfish	9"	1,600	North Platte

PREPARED BY:

Jack Peterson, Fisheries Supervisor

(Name and Title)

9-18-98

(Date)

Box Butte Reservoir Revised Lake Management Plan

(Title of Paper)

REVIEWED BY:

\_\_\_\_\_  
(Name and Title)

\_\_\_\_\_  
(Date)

APPROVED BY:

*Donna French* Assist Admin

(Name and Title)

9-22-98

(Date)

# BOX BUTTE RES. STORAGE FOLLOWING SUMMER IRRIGATION DEMAND

1970-1998 / VALUES IN ACRE FEET (Rounded to the nearest 10 AF)

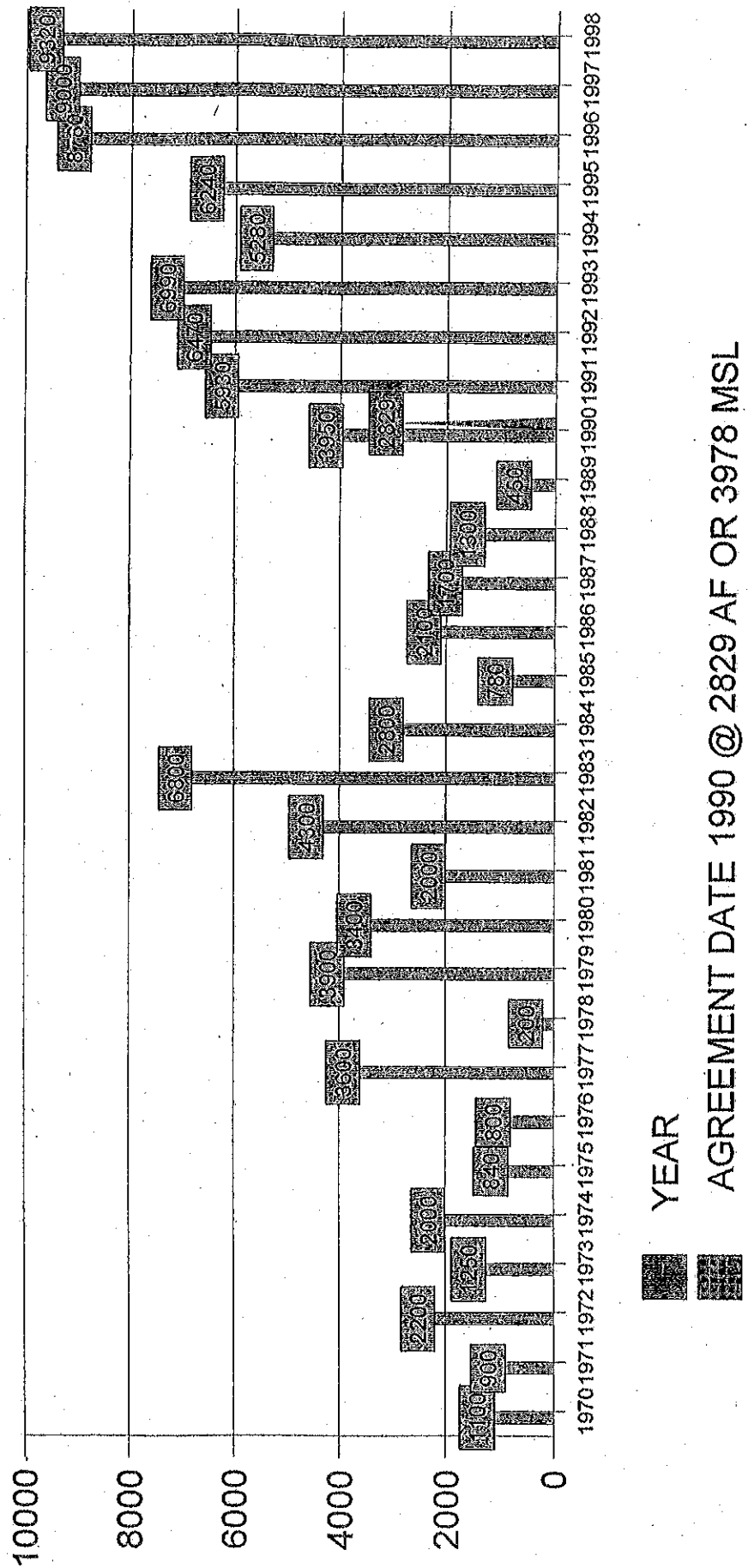


Table 1

## DOX BLUE RESERVOIR DRAW-DOWN LEVELS

Pre Irrigation				Post Irrigation			
Year	Acre Feet	Surface Acres	Date Discharge Started	Acre Feet Remaining	Surface Acres	Date Discharge Closed	%Draw Down
1970	20181	1261	July 1	1105	181	September 6	94%
1971	20652	1276	June 26	981	168	September 8	95%
1972	16547	1132	July 3	2211	320	September 9	87%
1973	20143	1260	June 24	1368	212	September 6	93%
1974	19132	1229	June 26	1918	284	August 30	90%
1975	16761	1141	July 5	874	156	September 2	95%
1976	14339	1038	July 1	764	144	September 14	95%
1977	15009	1067	June 19	3803	474	September 1	75%
1978	18214	1197	June 29	2067	302	September 11	89%
1979	15872	1104	July 2	3962	485	September 15	75%
1980	19541	1243	June 27	3515	450	September 5	82%
1981	16015	1109	June 25	2052	302	September 10	87%
1982	16301	1122	July 9	4470	522	September 14	72%
1983	22475	1328	July 10	6968	672	September 10	70%
1984	21402	1298	June 30	2889	392	September 7	86%
1985	18416	1204	June 18	764	144	August 21	96%
1986	18155	1195	July 1	2391	343	September 8	87%
1987	18996	1225	June 24	1806	270	September 1	90%
1988	16312	1123	June 27	1381	215	September 1	91%
1989	12182	953	June 24	640	130	August 20	95%
1990	12377	961	July 5	3947	484	August 17	68%
1991	19082	1228	July 2	5925	612	August 31	69%
1992	17964	1188	July 9	6473	644	September 6	64%
1993	20691	1278	July 7	6988	675	September 13	66%
1994	20819	1281	June 21	5276	574	August 27	75%
1995	21677	1306	July 10	6242	631	September 16	71%
1996	19553	1243	July 1	8302	757	September 4	58%
1997	14893	1063	July 6	8997	798	September 5	40%
1998	20935	1285	July 2	10174	857	September 4	51%



## RESERVOIR DRAWDOWNS (Acre Feet) ---- 1988

	<u>High Pool</u>	<u>Low Pool</u>	<u>Percent Loss</u>
McConaughy	1,582,600	1,287,658	19%
Red Willow	32,347	25,245	22%
Merritt	75,370	43,301	43%
Swanson	104,598	58,945	44%
Sherman	69,653	36,781	47%
Medicine Creek	38,474	19,620	49%
Enders	29,727	13,934	53%
Minatare	56,000	14,100	75%
Box Butte	16,312	1,381	91%

**1988 was picked at random to illustrate the amount of water loss during an average irrigation year for different Nebraska reservoirs. The year 1988 was considered a below average precipitation year by the Bureau of Reclamation.**

## BOX BUTTE RESERVOIR - FISH STOCKING RECORD

<u>Date Stocked</u>	<u>Species</u>	<u>Size</u>	<u>Number</u>	<u>Source</u>
5/23/42	Bluegill	3-6"	7,820	State
9/24/42	B. Bass	3-8"	5,000	State
10/30/42	Bluegill	1-1 1/2"	37,240	State
10/20/43	Bullhead	2"	5,000	State
10/20/43	Bluegill	2-5"	3,450	State
10/21/43	Bass	2"	10,890	State
10/21/43	Bass	10"	960	State
10/17/44	Bass	3"	2,000	State
10/17/44	Bluegill	2 1/2-3"	3,000	State
10/18/45	Crappie	1/2-1 1/2"	12,000	Crawford
10/18/45	Bass	6"	600	Crawford
10/13/46	Bass	2-6"	12,000	Crawford
10/13/46	Bluegill	1"	36,000	Crawford
10/23/46	Crappie	3-6"	1,784	Crawford
10/23/46	Bullhead	3-8"	1,203	Crawford
10/23/46	Bluegill	3"	2,480	Crawford
10/23/46	Bass	3"	2,656	Crawford
3/14/47	W. Pike	18-30"	50	L. Maloney
5/6/47	Rainbow Trout	5-10"	1,400	Rock Creek
9/29/47	Crappie	3"	4,600	Crawford
9/29/47	Crappie	6-8"	800	Crawford
10/29/47	Crappie	2"	20,520	Valentine
4/7/48	Rainbow Trout	Adult	845	Fed. Hatchery
5/27/48	Brown Trout	Fing.	20,000	Fed. Hatchery
5/27/48	Rainbow Trout	Fing.	20,000	Fed. Hatchery
7/12/48	W. Pike	2 1/2- 2 3/4"	10,218	North Platte
3/22/49	Catfish	6-14"	1,401	Seining Crew
4/18/49	Brown Trout	Fing.	50,000	Fed.
4/18/49	Rainbow Trout	Fing.	15,000	Fed.
6/4/49	Brown Trout	Fing.	10,000	Fed.
6/6/49	N. Pike	2 1/2-3"	5,145	North Platte
7/1/49	Walleye	1 1/2"	7,044	North Platte
7/23/49	Walleye	2 1/2"	8,576	North Platte
3/16/50	Rainbow Trout	Adult	1,000	Fed.
3/16/50	Brown Trout	Adult	4,000	Federal
3/23/50	Catfish	6-15"	1,000	Salvage
5/15/50	Rainbow Trout	Fing.	10,000	Federal
5/15/50	Brown Trout	Fing.	15,000	Federal
7/30/50	Walleye	Fing.	4,536	North Platte
9/24/51	White Bass	3-12"	28	McConaughy
9/24/51	F. W. Drum	2-4"	410	North Platte
10/1/51	Bluegill	1"	86,000	Surplus-Crawford
10/4/51	Bluegill	Fing.	86,000	Crawford
6/28/52	W. Pike	2 1/2"	25,554	North Platte
7/11/52	W. Pike	2 1/2"	11,328	North Platte
3/24/53	Catfish	6-8"	1,585	Salvage
6/25/53	Walleye	2 1/2"	22,500	North Platte
9/30/53	Crappie	3-6"	20	Salvage

<u>Date Stocked</u>	<u>Species</u>	<u>Size</u>	<u>Number</u>	<u>Source</u>
9/30/53	Perch	3-6"	20	Salvage
10/24/53	Largemouth Bass	Fing.	4,230	USFWS
10/24/53	Bass	Fing.	20,000	Val.-Crawford
10/24/53	Bluegill	Fing.	48,000	Val.-Crawford
7/16/54	Walleye	2 1/2"	15,552	North Platte
9/27/54	Catfish	6-10"	700	
3/29/55	Catfish	6-12"	2,500	
4/55	Channel Catfish		3,000	
4/22/55	Rainbow Trout	Adult	1,000	Federal
4/23/55	Rainbow Trout	Adult	740	Federal
4/6/59	Rainbow Trout	Adult	1,000	
9/9/59	Crappie	4-6"	8,400	
9/9/59	Crappie	4-6"	4,200	
6/6/62	Walleye	1-1 1/2"	118,822	State
6/8/62	Walleye	1 1/2-2"	99,324	State
5/9/63	Northern Pike	1 1/2"	34,000	State.
5/10/63	Northern Pike	1 1/2"	32,000	State
10/19/65	Largemouth Bass	Fing.	24,103	State
10/20/65	Redear Sunfish	1"	15,000	Federal
10/20/65	Minnows		198,000 (est.)	Federal
10/20/65	Crayfish		198#	Federal
10/20/65	Largemouth Bass	3-5"	17,208	State
10/22/65	Largemouth Bass	Fing.	48,815	State
10/22/65	Smallmouth Bass	3-5"	21,520	State
10/65	Redear Sunfish	Fing.	15,013	Federal
10/65	Channel Catfish	Fing.	195,000	Federal
10/28/65	Largemouth Bass	Fing.	27,000	State
10/28/65	Channel Catfish	2-2 1/2"	200,000	State
10/28/65	Smallmouth Bass	3-5"	5,611	State
11-5-65	Redear Sunfish	1/2-1"	75,000	State
4/26/66	White Bass	10-14"	250	State
5/9/66	Walleye	1-2"	114,264	State
5/9/66	Walleye	1-2"	36,288	State
5/18/66	Northern Pike	1 1/2"	40,000	State
5/20/66	Northern Pike	2"	43,280	State
5/21/66	Northern Pike	1 1/2-2"	67,600	State
6/23/66	Walleye	1-2"	114,457	State
6/29/66	Walleye	1 1/2- 2 1/2"	27,880	State
6/29/66	Walleye	1 1/2- 2 1/2"	55,760	State
10/23/66	Largemouth Bass	2-3"	3,183	State
5/25/67	Northern Pike	Fing.	15,000	State
8/30/67	Catfish	1-1 1/2"	20,000	State
9/21/67	Rainbow Trout	6-7"	3,000	Federal
9/21/67	Brown Trout	6-7"	3,000	Federal
8/5/68	Bluegill	2-7"	2,800	State
9/20/68	Channel Catfish	2"	20,400	Federal
10/15/68	Rainbow Trout	7-8"	3,030	Federal
10/16/68	Brown Trout	8"	2,959	Federal

<u>Date Stocked</u>	<u>Species</u>	<u>Size</u>	<u>Number</u>	<u>Source</u>
6/13/69	Walleye	1 1/2-2"	66,096	State
10/2/69	Channel Catfish	1"	27,000	Federal
11/3/69	Brown Trout	7"	3,161	Federal
11/3/69	Brown Trout	7"	3,550	Federal
11/4/69	Brown Trout	7"	3,019	Federal
11/4/69	Brown Trout	7"	2,402	Federal
11/20/69	Rainbow Trout	5"	4,941	Federal
11/20/69	Rainbow Trout	5"	6,569	Federal
11/20/69	Rainbow Trout	5"	1,201	Federal
6/12/70	Walleye	2"	25,650	State
10/14/70	Catfish	3-12"	16,543	State
10/6/70	Brown Trout	Adult	3,981	Federal
10/6/70	Brown Trout	7"	2,600	State
11/10/70	Brown Trout	7"	450	Federal
12/30/70	Rainbow Trout	4"	10,038	Federal
7/1/71	Walleye	2-3"	35,808	State
11/10/71	Rainbow Trout	4"	4,012	Federal
6/15/72	Walleye	1 1/2"	51,714	State
7/7/72	Brown Trout	4"	4,057	Federal
7/7/72	Brown Trout	4"	4,057	Federal (Dam)
8/17/72	Brown Trout	5"	5,009	Federal (Dam)
9/29/72	Largemouth Bass	2-3"	37,346	State
11/2/72	Rainbow Trout	4"	10,007	Federal
5/4/78	Gizzard Shad	Adult	160	State
9/14/78	Channel Catfish	2-4"	48,000	Federal
4/30/81	Channel Catfish	2-4"	29,718	State
5/21/81	Gizzard Shad	Adult	313	State
10/2/81	Bluegill	1-2"	21,000	State
10/2/81	Largemouth Bass	3-4"	2,892	State
10/16/81	Bluegill	1-2"	18,000	State
5/26/82	Gizzard Shad	8"	800	State
8/3/82	Channel Catfish	6"	16,000	State
8/25/82	Walleye	3-4"	6,724	State
9/2/82	Walleye	4-6"	8,420	State
5/26/83	Gizzard Shad	Adult	220	State
8/22/83	Channel Catfish	4-7"	19,485	State
8/31/83	Walleye	4"	14,000	State
9/1/83	Walleye	3 1/2- 4 1/2"	7,000	State
9/8/83	Walleye	3 1/2- 4 1/2"	22,466	State
4/10/84	Rainbow Trout	3"	25,397	Federal
4/10/84	Brown Trout	2 1/2"	22,054	Federal
4/16/84	Channel Catfish	5"	13,945	Kansas
8/30/84	Walleye	4-6"	40,833	State
4/25/85	Channel Catfish	3"	13,000	State (NP)
5/10/85	Gizzard Shad	11"	307	Wellfleet
6/4/85	Walleye	1-2"	113,313	NPSH
8/27/85	Gizzard Shad	1-3"; 20"	201	Niobrara River
8/27/85	Northern Pike	6-24"	1,100	Niobrara River
8/27/85	Largemouth Bass	3-14"	24	Niobrara River

<u>Date</u> <u>Stocked</u>	<u>Species</u>	<u>Size</u>	<u>Number</u>	<u>Source</u>
8/27/85	Bluegill	6-10"; 1"	2,300	Niobrara River
8/27/85	Black Crappie	6-10"; 1"	1,100	Niobrara River
8/27/85	Yellow Perch	1-3"; 3-8"	8,200	Niobrara River
8/27/85	Walleye	6-18"	50	Niobrara River
9/9/85	Northern Pike	4-18"	114	Niobrara River
9/9/85	Largemouth Bass	3-10"	31	Niobrara River
9/9/85	Smallmouth Bass	3"	2	Niobrara River
9/9/85	Bluegill	1-2"	1,200	Niobrara River
9/9/85	Bluegill	3-7"	500	Niobrara River
9/9/85	Black Crappie	1-2"	1,200	Niobrara River
9/9/85	Black Crappie	3-7"	50	Niobrara River
9/9/85	Yellow Perch	1-2"	12,000	Niobrara River
9/19/85	Northern Pike	6-18"	18	Niobrara River
9/19/85	Largemouth Bass	3-12"	14	Niobrara River
9/19/85	Walleye	6-8"	3	Niobrara River
11/6/85	Channel Catfish	12"	1	Private Salvage
11/6/85	Largemouth Bass	12-16"	17	Private Salvage
11/6/85	Largemouth Bass	4-8"	45	Private Salvage
11/6/85	Rock Bass	8.5"	1	Private Salvage
10/25/85	Northern Pike	6-17"	39	Niobrara River
10/25/85	Largemouth Bass	3-11"	14	Niobrara River
10/25/85	Yellow Perch	3-4"	24	Niobrara River
10/25/85	Walleye	3-4"	2	Niobrara River
10/25/85	Walleye	6-8"	12	Niobrara River
5/9/86	Gizzard Shad	Adult	500	Lake Maloney
5/28/86	Walleye	1"	100,000	NFH
8/14/86	Channel Catfish	8-10"	4,750	State
9/12/86	Largemouth Bass	3"	12,670	VSH
5/12/87	Gizzard Shad	Adult	350	Lake Maloney
5/27/87	Walleye		100,000	NPSH
7/24/87	Channel Catfish		7,940	NPSH
9/4/87	Largemouth Bass	4"	12,912	VSH
9/14/87	Largemouth Bass	3"	6,080	VSH
3/29/88	Bluegill	1-2"	63,600	VSH
5/20/88	Gizzard Shad	7-14"	200	Wellfleet
7/7/88	Largemouth Bass	1.5"	13,135	VSH
7/7/88	Largemouth Bass	3"	243	VSH
7/7/88	Largemouth Bass	3.5"	100	VSH
10/17/88	Walleye	4-10"	94	Niobrara River
5/25/89	Gizzard Shad	Adult	130	Lake Maloney
3/19/90	Bluegill	½ - 1"	93,400	VSH
4/21/90	Walleye	Fry	472,500	NPSH
5/23/90	Gizzard Shad	Adult	150	Wellfleet
4/16/91	Walleye	Fry	500,000	NPSH
4/22/91	Yellow Perch	Eggs	1,012,500	VSH
6/11/91	Gizzard Shad	8"	300	Wellfleet
8/7/91	Channel Catfish		11,700	NPSH

<u>Date</u> <u>Stocked</u>	<u>Species</u>	<u>Size</u>	<u>Number</u>	<u>Source</u>
9/19/91	Black Crappie	2"	42	Can Below D.
9/19/91	Rock Bass	8"	56	Dam Canal
9/19/91	Largemouth Bass	4"	81	Dam Canal
9/19/91	Bluegill	4"	33	Dam Canal
9/19/91	Yellow Perch	3"	867	Dam Canal
9/19/91	Walleye	13"	16	Dam Canal
3/24/92	Gizzard Shad	10-15"	120	Rock Creek
3/17/92	Bluegill	1"	50,000	VSH
4/15/92	Walleye	Fry	500,000	NPSH
8/4/92	Channel Catfish	6-9"	16,000	NPSH
9/28/92	Bluegill	1"	52,680	VSH
8/17/93	Channel Catfish	6-8"	16,873	NPSH
9/22/93	Walleye	4-6"	2,231	NPSH
9/22/93	Walleye	4-6"	2,809	NPSH
9/22/93	Walleye	4-6"	4,004	NPSH
9/22/93	Walleye	4-6"	2,292	NPSH
9/23/93	Walleye	4-6"	10,527	NPSH
9/23/93	Walleye	4-6"	3,120	NPSH
9/23/93	Walleye	4-6"	5,115	NPSH
9/23/93	Walleye	4-6"	9,169	NPSH
3/24/94	Bluegill	1"	78,000	RCSH
6/3/94	Walleye	1"	24,000	CAH
9/8/94	Channel Catfish	8.5"	3,236	VSH
9/13/94	Channel Catfish	8.5"	4,764	VSH
9/12/95	Walleye	4-8"	12,200	CAH
9/19/95	Channel Catfish	8-10"	8,000	NPSH
9/11/96	Channel Catfish	9-10"	3,200	
9/5/96	Walleye	3-4"	8,000	
3/24/97	Bluegill	5"	35,000	Rock Creek
3/26/97	Bluegill	1"	45,000	Valentine
8/26/97	Walleye	5.6"	7,500	Calamus
9/9/97	Channel Catfish	9"	1,600	North Platte

NEBRASKA GAME AND PARKS COMMISSION - FISHERIES DIVISION - LENGTH FREQUENCY - AGE DISTRIBUTION ANALYSIS

LAKE - BOX BUTT(1600) STATIONS - ALL  
 SAMPLING DATES INCLUDED - 1 OCT 92 - 31 OCT 92  
 COLLECTION METHODS (EFFORT) - COMBINED EXP GL N  
 ( 0.0 ) ( 6.0 N-DY )  
 SEXES INCLUDED - BOTH  
 SPECIES - NO PIKE (18)

LENGTH INTERVAL (MM)	NUMBER OF FISH	PERCENT OF TOTAL	WEIGHT (GRAMS)	PERCENT OF TOTAL	MEAN WEIGHT	MEAN KTL	MEAN WR	AGE GROUP																
								0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
350- 374	2	5.7	600	2.7	300.0	0.60	0.99	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
375- 399	4	11.4	1380	6.3	345.0	0.60	0.99	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
400- 424	3	8.6	1089	5.0	363.3	0.53	0.86	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
425- 449	9	25.7	4662	11.8	518.0	0.61	0.99	0	2	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0
450- 474	5	14.3	2800	12.8	560.0	0.56	0.91	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
475- 499	7	20.0	4690	15.3	670.0	0.58	0.94	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0
500- 524	1	2.9	580	2.6	580.0	0.42	0.69	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
525- 549	1	2.9	820	3.7	820.0	0.53	0.85	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
550- 574	0	0.0	0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
575- 599	1	2.9	1230	5.6	1230.0	0.64	1.03	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
600- 624	0	0.0	0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
625- 649	0	0.0	0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
650- 674	1	2.9	2380	10.9	2380.0	0.79	1.27	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
675- 699	0	0.0	0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
700- 724	0	0.0	0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
725- 749	0	0.0	0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
750- 774	0	0.0	0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
775- 799	0	0.0	0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
800- 824	0	0.0	0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
825- 849	0	0.0	0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
850- 874	1	2.9	5090	25.2	5090.0	0.79	1.25	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL -	35		25321						0	9	22	3	1	0	0	0	0	0	0	0	0	0	0	0
									0	26	63	9	3	0	0	0	0	0	0	0	0	0	0	0
									0	7	8	5	3	0	0	0	0	0	0	0	0	0	0	0

MEAN WR - 0.958 MEAN LENGTH - 466. TOTAL AGED FISH 29( 82.9%)  
 SEX RATIO(M/F) - 1.000 TOTAL UNAGED FISH 6( 17.1%)

PSD - 11.4 WITH 95% CI 0.5- 22.4 BASED ON 35.0 FISH AND A RATIO OF 4.0/ 35.0  
 RSD-P: 2.9 WITH 95% CI 0.0- 0.0 BASED ON 35.0 FISH AND A RATIO OF 1.0/ 35.0  
 RSD-M: 0.0 WITH 95% CI 0.0- 0.0 BASED ON 35.0 FISH AND A RATIO OF 0.0/ 35.0  
 RSD-T: 0.0 WITH 95% CI 0.0- 0.0 BASED ON 35.0 FISH AND A RATIO OF 0.0/ 35.0

WEIGHT-LENGTH REGRESSION EQUATION - WEIGHT= 0.000009694\*LENGTH\*\*3.2927 R= 0.97896

LENGTH-SCALE RADIUS EQUATION - LENGTH= -45.2705383 + 3.34634\*SCALE RADIUS R= 0.93016









NEBRASKA GAME AND PARKS COMMISSION - FISHERIES DIVISION - LENGTH FREQUENCY - AGE DISTRIBUTION ANALYSIS

PAGE 25

LAKE - BOX BUTT(1600) STATIONS - ALL  
 SAMPLING DATES INCLUDED - 1 OCT 92 - 31 OCT 92  
 COLLECTION METHODS (EFFORT) -  
 COMBINED EXP GL N  
 ( 0.0 ) ( 6.0 N-DY )  
 SEXES INCLUDED - BOTH  
 SPECIES - WALLEYE (91)

LENGTH INTERVAL (MM)	NUMBER OF FISH	PERCENT OF TOTAL	WEIGHT (GRAMS)	PERCENT OF TOTAL	MEAN WEIGHT	MEAN KTL	MEAN WR	AGE GROUP																	
								0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
300- 324	4	15.4	1040	4.2	260.0	0.87	0.88	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
325- 349	0	0.0	0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
350- 374	2	7.7	830	3.3	415.0	0.85	0.83	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
375- 399	1	3.8	400	1.6	400.0	0.76	0.74	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
400- 424	3	11.5	1920	7.7	640.0	0.91	0.88	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
425- 449	0	0.0	0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
450- 474	2	7.7	2060	8.3	1030.0	0.99	0.93	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
475- 499	4	15.4	4350	17.4	1087.5	0.96	0.89	0	0	0	0	0	0	3	1	0	0	0	0	0	0	0	0	0	0
500- 524	7	26.9	9030	25.9	1290.0	0.97	0.90	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0
525- 549	1	3.8	1480	5.9	1480.0	0.95	0.87	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
550- 574	1	3.8	1850	7.4	1850.0	1.02	0.93	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
575- 599	0	0.0	0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
600- 624	0	0.0	0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
625- 649	0	0.0	0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
650- 674	0	0.0	0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
675- 699	0	0.0	0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
700- 724	1	3.8	4550	18.3	4550.0	1.32	1.15	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
TOTAL -	26		27510																						
						NO. BY AGE CLASS		0	3	7	1	1	3	8	2	0	1	0	0	0	0	0	0	0	0
						% BY AGE CLASS		0	12	27	4	4	12	31	8	0	4	0	0	0	0	0	0	0	0
						SE % BY AGE CLASS		0	6	9	4	4	6	9	5	0	4	0	0	0	0	0	0	0	0

MEAN WR - 0.893 MEAN LENGTH - 456. TOTAL AGED FISH 24( 92.3%)  
 SEX RATIO(M/F) - 1.000 TOTAL UNAGED FISH 2( 7.7%)  
 PSD - 76.9 WITH 95% CI 59.9- 93.9 BASED ON 26.0 FISH AND A RATIO OF 20.0/ 26.0  
 RSD-P: 11.5 WITH 95% CI -67.8- 90.9 BASED ON 26.0 FISH AND A RATIO OF 3.0/ 26.0  
 RSD-M: 3.8 WITH 95% CI 0.0- 0.0 BASED ON 26.0 FISH AND A RATIO OF 1.0/ 26.0  
 RSD-T: 0.0 WITH 95% CI 0.0- 0.0 BASED ON 26.0 FISH AND A RATIO OF 0.0/ 26.0

WEIGHT-LENGTH REGRESSION EQUATION - WEIGHT= 0.0000010013\*LENGTH\*\*3.3673 R= 0.99467  
 LENGTH-SCALE RADIUS EQUATION - LENGTH= 61.9538574 + 1.95007\*SCALE RADIUS R= 0.92795



TABLE 15. WEIGHTED MEAN BACKCALCULATED LENGTH AT AGE WITH MEAN  
 BACKCALCULATED LENGTH AT AGE FOR THE POPULATION.

SPECIES = Northern Pike METHOD = BOAT SHOCKER (NIGHT)

YEAR CLASS	AGE	N	AGE																					
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	
1997	0	2																						
1996	1	12	181																					
1995	2	4	168	312																				
1994	3	15	195	343	424																			
1993	4	10	162	368	442	473																		
1992	5	1	205	395	497	538	589																	
1989	8	1	122	344	575	624	664	740	802	849														
1987	10	1	99	256	415	551	603	703	828	957	1009	1026												
POPULATION MEAN (MM)			162	336	471	547	619	722	815	903	1009	1026												
POPULATION STANDARD ERROR			14	20	30	31	23	18	13	54														
POPULATION SAMPLE SIZE 'N'			44	32	28	13	3	2	2	2	1	1												
POPULATION LENGTH INCREMENT			174	135	76	72	103	93	88	106	17													

NOTE- N WAS DERIVED FROM AGE-LENGTH SUMMARY.





TABLE 15. WEIGHTED MEAN BACKCALCULATED LENGTH AT AGE WITH MEAN  
 BACKCALCULATED LENGTH AT AGE FOR THE POPULATION.

SPECIES = Rock Bass METHOD = STD FRAME NET

YEAR CLASS	AGE	N	AGE																				
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1996	1	21	49																				
1995	2	144	48	78																			
1994	3	51	50	82	125																		
1993	4	42	49	82	130	160																	
1992	5	23	44	79	129	171	195																
1991	6	5	50	91	146	190	222	236															
1990	7	3	48	85	144	187	210	229	240														
1989	8	1	48	81	131	158	189	229	236	244													
POPULATION MEAN (MM)			48	83	134	173	204	231	238	244													
POPULATION STANDARD ERROR			1	2	3	7	8	2	2														
POPULATION SAMPLE SIZE 'N'			290	269	125	74	32	9	4	1													
POPULATION LENGTH INCREMENT			35	51	39	31	27	7	6														

NOTE- N WAS DERIVED FROM AGE-LENGTH SUMMARY.





NEBRASKA GAME AND PARKS COMMISSION  
 1997 STANDARD SURVEY FOR Box Butte Reservoir (BOR)

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TABLE 15. WEIGHTED MEAN BACKCALCULATED LENGTH AT AGE WITH MEAN  
 BACKCALCULATED LENGTH AT AGE FOR THE POPULATION.

SPECIES = Largemouth Bass METHOD = BOAT SHOCKER (NIGHT)

YEAR CLASS	AGE	N	AGE																					
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	
1996	1	5	79																					
1995	2	3	78	162																				
1992	5	3	72	207	281	329	363																	
1990	7	1	98	216	353	416	453	470	478															
POPULATION MEAN (MM)			82	195	317	372	408	470	478															
POPULATION STANDARD ERROR			6	17	36	43	45																	
POPULATION SAMPLE SIZE 'N'			12	7	4	4	4	1	1															
POPULATION LENGTH INCREMENT			113	122	55	36	62	8																

NOTE- N WAS DERIVED FROM AGE-LENGTH SUMMARY.



TABLE 15. WEIGHTED MEAN BACKCALCULATED LENGTH AT AGE WITH MEAN  
 BACKCALCULATED LENGTH AT AGE FOR THE POPULATION.

SPECIES = Black Crappie METHOD = STD FRAME NET

YEAR CLASS	AGE	N	AGE																				
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1996	1	1	68																				
1995	2	3	62	123																			
1994	3	1	58	114	168																		
1992	5	1	59	143	207	255	292																
POPULATION MEAN (MM)			62	127	187	255	292																
POPULATION STANDARD ERROR			2	9	20																		
POPULATION SAMPLE SIZE 'N'			6	5	2	1	1																
POPULATION LENGTH INCREMENT			65	60	68	37																	

NOTE- N WAS DERIVED FROM AGE-LENGTH SUMMARY.



TABLE 15. WEIGHTED MEAN BACKCALCULATED LENGTH AT AGE WITH MEAN  
 BACKCALCULATED LENGTH AT AGE FOR THE POPULATION.

SPECIES = Yellow Perch METHOD = STD FRAME NET

YEAR CLASS	AGE	N	AGE																					
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	
1996	1	7	70																					
1995	2	110	60	101																				
1994	3	37	67	112	158																			
1993	4	41	69	117	165	196																		
1992	5	22	63	109	160	206	241																	
1991	6	8	62	112	166	219	260	282																
1989	8	1	62	111	176	242	256	271	281	291														
POPULATION MEAN (MM)			65	110	165	216	252	277	281	291														
POPULATION STANDARD ERROR			2	2	3	10	6	6																
POPULATION SAMPLE SIZE 'N'			226	219	109	72	31	9	1	1														
POPULATION LENGTH INCREMENT			45	55	51	36	25	4	10															

NOTE- N WAS DERIVED FROM AGE-LENGTH SUMMARY.

