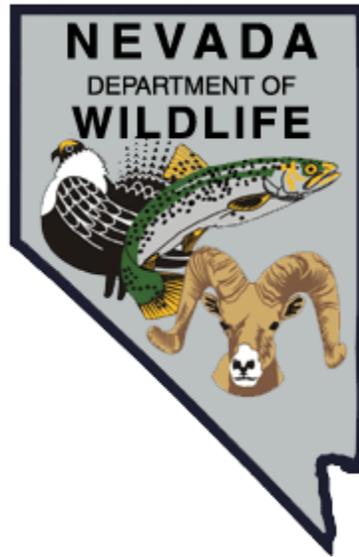


NEVADA DEPARTMENT OF WILDLIFE
STATEWIDE FISHERIES MANAGEMENT



FEDERAL AID JOB PROGRESS REPORTS

F-20-48
2012

Mason Valley Wildlife Management Area Ponds

WESTERN REGION



**NEVADA DEPARTMENT OF WILDLIFE, FISHERIES DIVISION
ANNUAL PROGRESS REPORT**

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ANNUAL PROGRESS REPORT**

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**NEVADA DEPARTMENT OF WILDLIFE, FISHERIES DIVISION
ANNUAL PROGRESS REPORT**

State: *Nevada*
Project Title: *Statewide Fisheries Program*
Job Title: *Mason Valley Wildlife Management Area Ponds*
Period Covered: *January 1, 2012 through December 31, 2012*

SUMMARY

Hinkson Slough remained near or at full capacity throughout the year. Triploid grass carp grew substantially and aquatic vegetation has been visibly less since their introduction. Survival of stocked rainbow trout was moderate as summertime water temperatures increased through July and August. Anglers were satisfied with fishing at the Mason Valley Wildlife Management Area and Hinkson Slough received most of the angling pressure. A strain evaluation of rainbow trout has been completed; under current management strategies bowcutt trout outperformed the other strains.

North Pond had limited angler use, even during winter and spring when rainbow trout were stocked. Dense aquatic vegetation continued to interfere with angling from shore and boats. Triploid grass carp were stocked during spring 2010 and augmented during 2011. Rainbow trout were stocked into North Pond; however, only a few showed up during angler surveys. Largemouth bass fishing at North Pond increased during 2012 for the third year and fish larger than five pounds were reported. A herbicide project was successful in reducing some of the rooted aquatic vegetation through some of the deeper channels allowing more access by boats.

Fort Churchill Cooling Pond (FCCP) showed decreased use from 2010 through 2012. The power plant that historically kept the water warm through the winter was shut down and the pond iced over. A lack of vegetation in and around the ponds results in poor cover habitat for juvenile largemouth bass. Artificial habitat structures were placed along the inner dike from 2008 to 2010 to provide cover for young bass. Visual observations along the inner dike and shorezone showed that young largemouth have benefitted from these habitat structures. In response to the cooler pond temperatures, trout were stocked in the spring 2012.

A slot limit for largemouth bass went into effect in 2008. The new regulations are intended to protect fish in the 11 to 14 inch range and allow harvest of smaller fish (<11 in) and larger fish (>14 in). The intent of this regulation is to increase the number of largemouth bass reaching the larger harvestable size of 14 inches; however, based on angler contacts, very few anglers choose to harvest fish under 11 inches suggesting that the slot regulation is not accomplishing its intended purpose.

BACKGROUND

Mason Valley Wildlife Management Area (MVWMA) is located within the Walker River Basin, is owned by Nevada Division of State Lands, and Nevada Department of Wildlife (NDOW) has management responsibilities. There are numerous ponds throughout the area and with the completion of Mason Valley Hatchery (MVH) in 1990; all ponds

within the first series (i.e., Hinkson Slough, Bass, Crappie, and North Ponds) receive hatchery effluent. Many other ponds receive water from the Walker River, via the Joggles Ditch. The first series ponds (called the fishing series ponds) are managed heavily for sport fish, along with waterfowl. The Eastside Waterfowl Series Ponds are managed primarily for waterfowl and some fishing, however, does occur late in the season.

Anglers can possess up to 15 warmwater fishes (e.g., largemouth bass, bluegill, crappie, and catfish) with a maximum of two largemouth bass none of which may be between the length of 11 and 14 inches. Rainbow trout are stocked to provide early season fishing in some waters, while they provide angling throughout the entire season in Hinkson Slough. The harvest limit for trout on the management area is five; however, in Hinkson Slough there is a two trout limit with a minimum length of 16 total inches and only artificial lures are allowed. The angling season begins the second Saturday in February and ends September 30 in the First Series Ponds; while the season lasts from August 16 to September 30 in the Eastside Waterfowl Series Ponds.

OBJECTIVES

General Management Objectives:

- Conduct a general fisheries assessment through opportunistic angler contacts, angler drop box surveys, and mail-in angler questionnaire data.
- Monitor lake level and clarity when on site.
- Install an electronic temperature sensor in Hinkson Slough and Fort Churchill Cooling Pond (FCCP).
- Concurrent to population monitoring, collect catchable sized game fish and submit to the EPA Laboratory for mercury analysis.
- Based on data collected through the ongoing studies at Hinkson Slough, evaluate the common carp population in Hinkson Slough and develop a timeline for eradication.
- Augment North Pond with grass carp to control submergent vegetation and improve angling conditions.
- Stock 1,000 channel catfish in North Pond and 1,000 in FCCP.
- Augment 500 largemouth bass in Bass Pond and 500 in Crappie Pond.
- Augment 1,000 bluegill in Bass pond and 1,000 in Crappie Pond.

Study Specific Objectives - Hinkson Slough Largemouth Bass Study:

- Collect information through hook-and-line utilizing volunteer anglers and fishing clubs.
- Conduct a general fisheries assessment through opportunistic angler contacts, return of angler drop-box surveys, and mail-in, angler questionnaire data.
- Based on the findings of this study determine if changes to the current regulations is warranted and, if so, propose those changes to the Wildlife Commission.
- Analyze data and write the final Job Progress Report.

Study Specific Objectives - Hinkson Slough Rainbow Trout Study:

- Provide information to anglers regarding tagged fish with signage at Hinkson Slough throughout the year.

- Provide certificates of appreciation to anglers who provide tag information; certificate will include strain of fish, size at stocking, egg hatch date, source of eggs, name of tagger, and date of stocking.
- Monitor tagged fish in Hinkson Slough through electrofishing at four established transects during one night in the fall after the close of the fishing season, one hook and line survey during angling season, and frame netting over four net nights after the angling season ends.

PROCEDURES

General Fisheries Objectives:

Conduct a general fisheries assessment through opportunistic angler contacts, angler drop box surveys, and mail-in, angler questionnaire data. Information obtained from the anglers included total time fishing and number, size, and species of fish caught. Location of angler, place of residence, and type of bait or lure used was also recorded. Drop-boxes were located at Hinkson Slough, North Pond, and the Fort Churchill Cooling Pond (FCCP). Mail-in, angler questionnaires were mailed at the end of 2011 to about 10 percent of the anglers purchasing a Nevada license. Data was received and summarized for number of anglers, days spent fishing, and number of fish caught.

Monitor water quantity (lake level), water quality (clarity), when on-site. Visual observations were made and recorded for all fishing series ponds while onsite throughout 2012. Data recorded included estimated depth of pond, estimated percentage of open water, and type of vegetation.

Install an electronic temperature sensor in Hinkson Slough and Fort Churchill Cooling Pond (FCCP). Temperature loggers were not placed in Hinkson Slough or FCCP during 2012. Water temperature was monitored occasionally by taking measurements with a hand-held thermometer.

Concurrent to population monitoring, collect catchable sized game fish and submit to the EPA Laboratory for mercury analysis. Three bluegill and six largemouth bass were caught by hook-and-line during November and sent to the EPA lab for mercury analysis.

Based on data collected through the ongoing studies at Hinkson Slough, evaluate the common carp population in Hinkson Slough and develop a timeline for eradication. The common carp population in Hinkson was evaluated concurrent to sport fish monitoring activities including electrofishing and angler contact surveys. Research was conducted to evaluate historical carp establishment and the effect on the sport fishery, particularly the events leading to their eradication in 2001.

Augment North Pond with grass carp to control submergent vegetation and improve angling conditions. Triploid grass carp were not planted into North Pond during 2012 due to concerns over a possible eradication project proposed within the next few years. However, a project to control submergent vegetation using a granular herbicide (Sculpin G) was completed during the summer 2012 utilizing funding from the Department's Conservation Fee Account.

Stock 1,000 channel catfish in North Pond and 1,000 in FCCP. North Pond and Fort Churchill Cooling Pond did not receive channel catfish during 2012 due to a disease outbreak at the supplier's hatchery, several hatcheries were affected and there was a shortage of channel catfish nationwide.

Augment 500 largemouth bass in Bass Pond and 500 in Crappie Pond. On May 9, 2012, 201 largemouth bass from Bilk Creek Reservoir were planted into Bass Pond. No largemouth bass were planted in Crappie Pond during 2012; the largemouth bass, which were scheduled to go into Crappie Pond, were instead taken to the newly opened Mitch Park Pond in Gardnerville.

Augment 1,000 bluegill in Bass Pond and 1,000 in Crappie Pond. No bluegill were planted in Bass Pond or Crappie Pond during 2012, 150 bluegill taken from Hinkson Slough which were scheduled to be stocked into Bass Pond and Crappie Pond were instead stocked on May 9, 2012 into the newly opened Mitch Park Pond in Gardnerville.

Study Specific Objectives, Hinkson Slough Largemouth Bass Study:

Collect information through hook-and-line utilizing volunteer anglers and fishing clubs. Volunteer anglers were utilized during 2012 and provided valuable information, particularly at ponds that do not typically receive heavy angler use such as Bass Pond and Crappie Pond.

Conduct a general fisheries assessment through opportunistic angler contacts, return of angler drop box surveys, and mail-in, angler questionnaire data. The same procedures were used as general fisheries objectives.

Based on the findings of this study determine if changes to the current regulations is warranted and, if so, propose those changes to the Wildlife Commission. Basic descriptive statistics including growth and catch rate averages, maximums and minimums, maximum size, harvest rates, and general reproductive success were evaluated.

Analyze data and write final Job Progress Report. All available data was evaluated during the winter of 2012 and this Final Job Progress Report was completed in February 2013.

Study Specific Objectives, Hinkson Slough Rainbow Trout Study:

Provide information to anglers regarding tagged fish with signage at Hinkson slough throughout the year. Signs were posted around Hinkson Slough on standard T-posts prior to the fishing season advising anglers of the ongoing study. Information was also posted on the kiosk that was installed near the pond entry road.

Provide certificates of appreciation to anglers who provide tag information; certificate will include strain of fish, size at stocking, egg hatch date, source of eggs, name of tagger, and date of stocking. All anglers who provided useful tag return data during 2012 received a "Certificate of Appreciation" with this information.

Monitor tagged fish through electro fishing at four established transects during one night in the fall after the close of the fishing season, one hook and line survey during angling season, and frame netting over four net nights after the angling season ends. Electroshocking was completed at Hinkson Slough on the evening of October 23, 2012 using an 18 ft Smith-Root aluminum boat with two 24 in “spider” anodes. The electroshocker was set at 60 volts pulsed DC at 30 percent of range and sampling occurred for approximately 10 min at each of the four transects. Three samplers were present and data recorded included species of fish, length of fish, number of fish, electrofisher settings, length of transect in seconds and feet, and general health of all fish caught.

Analyze data and write final Job Progress Report. All available data was analyzed during the winter of 2012 and the Final Job Progress Report was completed in February 2013.

FINDINGS

General Management Objectives

Conduct a general fisheries assessment through opportunistic angler contacts, angler drop-box surveys, and mail-in, angler questionnaire data. A total of 44 anglers were contacted during 2012 at Hinkson Slough and FCCP. Rainbow trout and largemouth bass comprised the majority of the anglers’ creel at Hinkson Slough and North Pond. Catch rates reported by anglers through opportunistic angler contacts was 0.48 fish per hour, rainbow trout averaged 14 inches and bass averaged 14.5 inches.

A total of 81 anglers filled out drop-box surveys during 2012 at Hinkson, North Pond and FCCP. Drop-box data from the FCCP reported an average catch rate of 0.94 fish per hour, slightly below the 10 year average (Table 1); however, the assessment was based on a very limited data set as only four anglers reported their catch at the FCCP drop-box during 2012.

Table 1

Fort Churchill Cooling Pond Drop-Box Data

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Ave
No. Anglers	16	7	0	19	10	22	36	29	23	4	17
Hrs Fished	57	20	0	70	51	80.5	178.5	131.5	90.5	17	70
No. Catfish	70	6	0	38	68	38	191	25	2	0	44
No. LM Bass	31	15	0	6	0	35	120	75	18	16	32
No. Bluegill	0	0	0	0	15	0	7	1	0	-	2
No. Trout	-	-	-	-	-	-	-	-	-	0	0
Fish/Hour	1.77	1.05	0.00	0.63	1.63	0.91	1.78	0.77	0.22	0.94	0.97
Fish/Day	6.31	3.00	0.00	2.32	8.30	3.32	8.83	3.48	0.87	4.00	4.04

The annual mail-in questionnaire for 2011 showed that catch rate at FCCP was 1.08 fish per day, which was higher than the drop-box reported catch rate of 0.87 fish per day during 2011 (Table 2 and 3).

Angler drop-box data indicated that North Pond had limited angler use in 2012 (Table 2). Angler use was also limited in 2011 as represented by the mail-in angler questionnaire data (Table 3); this was likely due to excessive submergent aquatic vegetation that limited angler access. In 2011, aquatic vegetation was estimated to be in excess of 70% canopy cover over the pond. This dense aquatic vegetation became established probably as a result of low water levels and high nutrient loads during 2008 and 2009. A habitat improvement project, funded through the Department's Conservation Fee Account, was implemented during 2012, and resulted in reduced aquatic vegetation in several areas around North Pond through the use of herbicide. Improved angler access was reported by several bass anglers whom also caught over 40 fish per day in 2012.

2012 Drop-Box Survey at North Pond **Table 2**

	Fish/Day	Fish/Hour	No. Anglers
Hinkson	12.23	2.31	71
North Pond	15.5	2.82	6
FCCP	4	0.94	4

2011 Mail-in, Angler Questionnaire **Table 3**

	North Pond	FCCP	Hinkson
No. Anglers	28	93	61
Days	51	222	172
Days/Angler	1.82	2.39	2.82
No. Fish	301	239	926
Fish/Day	5.9	1.08	5.38
Fish/Angler	10.75	2.57	15.18

Table 1 shows catch rates at FCCP fell within the range of the Warmwater Quality Fishery Management Concept, which states "Angler catch rates should range between 0.30 and 1.25 fish per hour and 2.0 and 3.5 fish per angler day." The Warmwater Quality Fishery Concept also states "For these fisheries, anglers are provided the opportunity to consistently catch large fish, at high angler success rates." Even though large fish have been caught from FCCP, it was not consistent. The company which owns the power plant has operated it intermittently over the past couple years and water temperatures have subsequently dropped.

Anglers at Hinkson Slough reported a high satisfaction with their overall fishing experience, size of fish caught and number of fish caught (Table 4). According to the drop-box data, angler catch rates (fish per hour, fish per day), number of fish caught, number of anglers, number of hours spent fishing, and angler satisfaction with size of fish, number of fish, and overall fishing experience were higher in 2012 than in 2011. During 2008, 38% of trout caught were larger than 11 in, during 2009, 83% of trout caught were larger than 11 in, during 2010, 88% of trout caught were larger than 11 inches, during 2011, 59% of trout caught were larger than 11 in, and during 2012, 74% of trout caught were larger than 11 in. Comparing the drop-box data and angler satisfaction data from 2012 to previous years, angler participation at Hinkson Slough remained high (63% higher

than the 10 year average) angler caught more fish (216 percent more than the ten year average) and were very satisfied.

Hinkson Slough Angler Satisfaction Ratings **Table 4**

	-2	-1	0	1	2	Total Ave.
Fishing exp.			3	20	46	1.62
Size of Fish			13	21	34	1.31
No. of Fish		1	8	19	39	1.43

Monitor lake level and clarity when on-site. Mason Valley Wildlife Management Area personnel manage the water. Water quality and clarity remained good for the majority of 2012; however, during the fall, water clarity was noticeably reduced, most likely to the increasing common carp population. Water levels also remained high during most of 2012 for North Pond, FCCP, and Hinkson Slough. Bass and Crappie ponds were drained, excavated, and refilled by Management Area personnel during 2011. The ponds were refilled and, in 2012, Bass Pond was stocked with 201 largemouth bass from Bilk Creek Reservoir.

Due to the high nutrient loads provided by hatchery effluent, submergent vegetation has become a nuisance to anglers in many of the fishing series ponds. Triploid grass carp were first introduced into Hinkson Slough during 2006, resulting in the improvement of channels previously choked by weeds and inaccessible to anglers. In 2010, a habitat improvement project was funded by the Department’s Conservation Fee Account to use biological and chemical means to deal with the aquatic vegetation problem in North Pond. Triploid grass carp were introduced into North Pond during 2010 to reduce submergent vegetation; additionally, herbicide treatments in North Pond, conducted in spring 2011 and spring 2012, were successful in reduction of rooted aquatic vegetation. Monitoring throughout the fishing season indicates the herbicide treatment and grass carp have had some successful in reducing the amount of vegetation (see Objective regarding grass carp and vegetation control below). Anglers reported being able to access more of the pond and fish in areas that previously were not accessible.

Install an electronic temperature sensor in Hinkson Slough and Fort Churchill Cooling Pond (FCCP). Temperature loggers were not placed in Hinkson or FCCP during 2012. Water temperature was monitored by taking measurements with a hand-held thermometer. The highest recorded surface water temperature for Hinkson Slough during 2012 was 84°F in July; however, at a depth of two feet, the temperature was 75°F. Flows were limited in Hinkson Slough during this time; however, due to the vegetation management (grass carp) and the small amount of cool hatchery water flowing in, rainbow trout were able to find thermal cover and survive this warm period and carryover was observed for the fourth consecutive year based on electroshocking data.

Concurrent to population monitoring, collect catchable sized game fish and submit to the EPA Laboratory for mercury analysis. Game fish were collected through hook-and-line sampling during November and sent to the EPA lab in San Francisco. Results are shown in Table 5. No fish sampled was above 1.0 part per million, the “No Consumption” health advisory limit set by the Division of Public and Behavioral Health.

Hinkson Slough Mercury Analysis

Table 5

	Species	Length, MM	Grams	Hg, PPM	Date
Hinkson Slough	bluegill	185.0	134	0.11	11/15/2012
Hinkson Slough	bluegill	141.0	50	0.09	11/15/2012
Hinkson Slough	bluegill	111.0	26	0.16	11/15/2012
	Average	145.7	70.0	0.12	
Hinkson Slough	largemouth	146.0	36.0	0.16	11/15/2012
Hinkson Slough	largemouth	152.0	43.0	0.33	11/15/2012
Hinkson Slough	largemouth	143.0	34.0	0.13	11/15/2012
Hinkson Slough	largemouth	131.0	28.0	0.21	11/15/2012
Hinkson Slough	largemouth	123.0	25.0	0.15	11/15/2012
Hinkson Slough	largemouth	133.0	26.0	0.13	11/15/2012
	Average	138.0	32.0	0.2	

Based on data collected through the ongoing studies at Hinkson Slough, evaluate the common carp population in Hinkson Slough and develop a timeline for eradication. Common carp numbers have increased during electrofishing surveys from 4 fish during 2010 to over 300 during 2012. This is consistent with numbers found during 1994 to 1996 prior to the carp eradication project conducted during 2001. Trout numbers declined 90% from 1994 to 1996 and 72% from 2010 to 2012. Current and historical data suggest that trout numbers will continue to decline to very low numbers (less than 10 trout were observed in 1996 and 1997) within three years after reinvasion of common carp. An eradication project will likely occur in the near future.

Augment North Pond with grass carp to control submergent vegetation and improve angling conditions. North Pond received 1,500 triploid grass carp on April 26, 2010 to control submergent vegetation. The decision was made to not stock grass carp in 2012 due to the possibility of a fish eradication project in the fishing series ponds within the next few years. In 2011 and 2012, a herbicide project using Sculpin G, a granular 2-4 D, was completed along the deeper channels in North Pond. Monitoring during 2012 was limited to only visual observations along the shore zone and boater reports. There was no observable decrease in vegetation along the shore, however, several boaters reported being able to access more of the pond. It is likely that the combination of grass carp and herbicide contributed to the increase in boating accessibility.

Stock 1,000 channel catfish in North Pond and 1,000 in FCCP. Channel catfish were not stocked during 2012 due to a shortage of supply at the hatcheries.

Augment 500 largemouth bass in Bass Pond and 500 in Crappie Pond. A total of 201 largemouth bass were stocked into Bass Pond during May 2012. No largemouth bass were stocked into Crappie Pond during 2012. Instead, a total of 386 largemouth bass, taken from Hinkson Slough during fall electrofishing efforts, were stocked into the newly opened Mitch Park Pond in Gardnerville as it was determined that this new pond was a higher priority recipient of warmwater fish than Crappie Pond.

Augment 1,000 bluegill in Bass Pond and 1,000 in Crappie Pond. Bluegill were not stocked into Bass Pond or Crappie Pond during 2012. Instead, 150 bluegill taken from

Hinkson Slough during fall electrofishing efforts were stocked into the newly opened Mitch Park Pond in Gardnerville as it was determined that this new pond was a higher priority recipient of warmwater fish.

Study Specific Objectives – Hinkson Slough Largemouth Bass Study

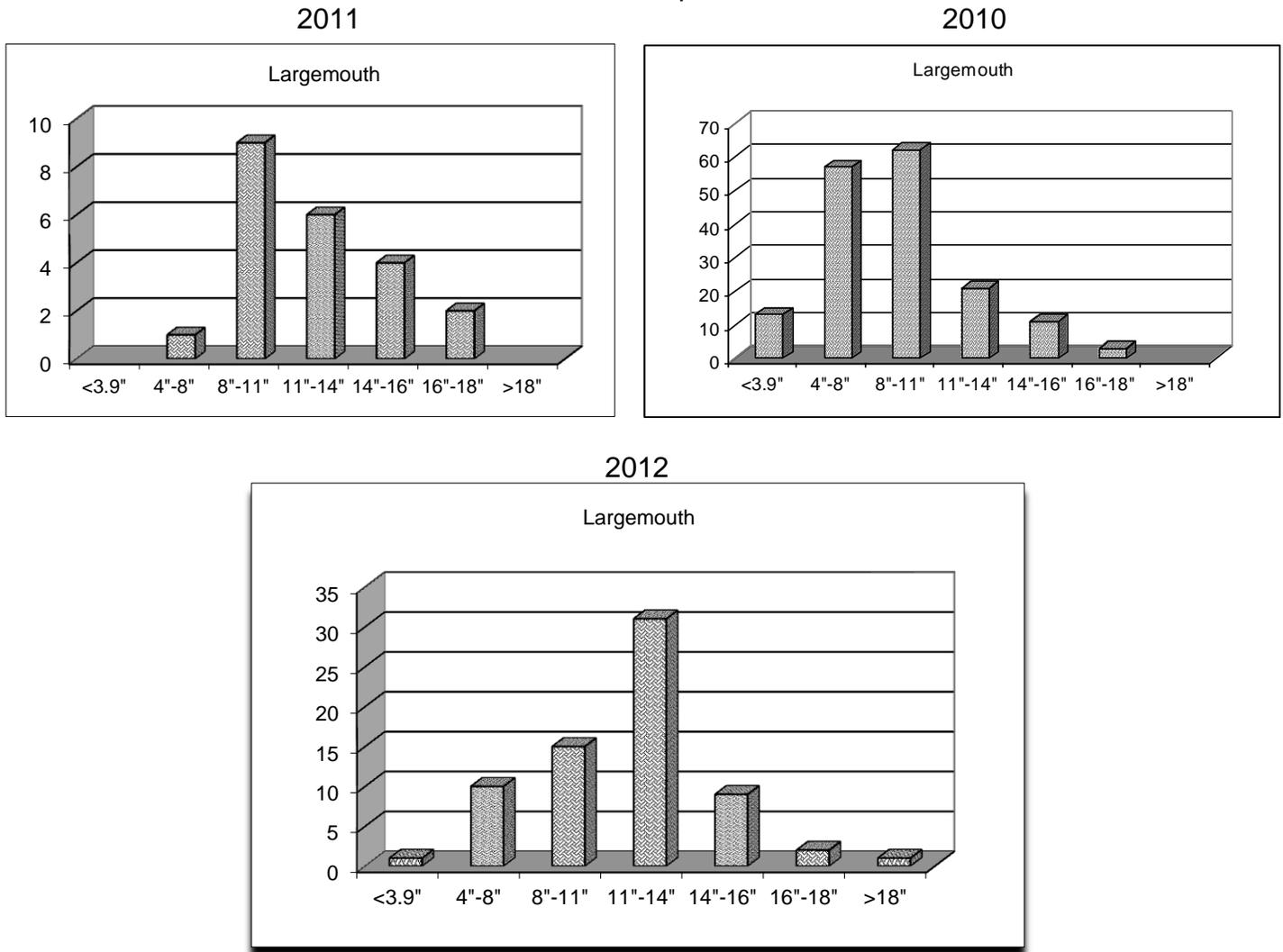
Collect information through hook-and-line utilizing volunteer anglers and fishing clubs. Fishing clubs primarily focused on fly fishing for trout during 2012 at Hinkson Slough. The primary biologist was able to attend several of the “fish-outs” organized by the local fishing clubs in 2012. Approximately 35 anglers from several groups representing the Carson Fly Fishing Club, Truckee River Fly Fishers, and Great Basin Bassers participated. Volunteer anglers provided limited information throughout the summer. Largemouth bass caught by volunteer anglers during 2010 averaged 16.4 in and a catch rate of 0.67 fish per hour. During 2011, largemouth averaged 11.5 in and a catch rate of 0.45 fish per hour. During 2012, largemouth averaged 14.5 in and a catch rate of 0.48 fish per hour. No largemouth bass smaller than 11 in were harvested by anglers contacted during 2012.

Conduct a general fisheries assessment through opportunistic angler contacts, return of angler drop-box surveys, and mail-in, angler questionnaire data. Opportunistic angler contacts during 2012 resulted in an increase in catch rates and size of fish; however, the number of fish caught was lower than 2011. Size frequency of largemouth bass reported from the drop-box survey is represented in Figure 1. During 2010, two size classes comprised the majority of the catch, 4-8 in at 34% and 8-11 in at 37%. During 2011, the majority of fish reported were in the 8-11 inch size class, 27% of fish reported were larger than 14 in. Even though this might suggest a shift in the population size structure, the difference in total number of fish reported is substantial, 24 during 2011 and 167 during 2010; therefore, the small sample size from 2011 should not be used solely for analysis of regulation effectiveness. During 2012, 17% of largemouth bass reported were larger than 14 in and the majority of fish were in the 11-14 inch size class.

Mail-in angler questionnaire data does not differentiate between anglers catching rainbow trout or largemouth bass and due to the large number of rainbow trout being caught between 2009 and 2012; this data should not be used alone for evaluation of the regulation change for largemouth bass. However, estimated catch rates, number of anglers, and number of fish caught can provide some insight into the general success of the overall management strategies for the fishery.

Figure 1

Hinkson Drop-Box



Based on the findings of this study, determine if changes to the current regulation is warranted and, if so, propose those changes to the Wildlife Commission. Analyze data and write final Job Progress Report. During the electroshocking survey in November 2012, 123 largemouth bass were caught. This number is above average for the period following the reintroduction during 2002. The average annual number of largemouth bass caught during the previous seven years was 72 individuals. The total catch per unit effort (CPUE) in 2012 was 180 fish per hour, which is slightly above the nine year average of 130. Since 1993, 14 electrofishing surveys have been completed at Hinkson Slough and only two largemouth bass have made it into the largest size category (greater than 21 inches); the first fish was sampled in 1997 and the second during 2010. Coincidentally, a new water record for largemouth bass was entered for Hinkson Slough on April 14, 2010; it weighed 7 lbs 14 oz, this record was again broken (by the same angler) on April 3, 2012; it weighed 8 lbs 5 oz and was 23 in long. A lack of recruitment had been observed during 2010 and 2011 with only a few individuals captured being less than 4 in; however, during 2012, 56% of largemouth bass were less than 5 inches. Since the regulation change in 2008, the catch per unit effort (CPUE) of

largemouth per 10 min of shocking effort has not increased from levels observed in 2007 for fish in the 14-18 inch size class (Table 6).

Hinkson CPUE Electrofishing - Largemouth Bass **Table 6**

Year	<4.9"	5-5.9"	6-7.9"	8-9.9"	10-11.9"	12-13.9"	14-15.9"	16-17.9"	18-19.9"	20-21.9"
2007	5	0.67	0.67	2.67	2.67	2.33	4.33	2.67	0.00	0.00
2009	15.11	0.21	4.04	1.91	0.85	0.64	0.64	0.64	0.21	0.00
2010	0.36	0.00	1.25	0.71	0.89	0.18	0.89	0.00	0.00	0.18
2011	0.49	0.49	3.41	0.73	2.93	2.44	1.71	0.98	0.98	0.00
2012	12.38	4.29	1.19	2.86	0.95	0.71	0.24	0.24	0.00	0.00

All available population data from the 2008 through 2012 fishing seasons suggest that the largemouth bass population has grown as expected since their re-introduction following the rotenone treatment in 2001, and is consistent with historical population sampling data (Table 7). Available angler data also suggests that fishing for largemouth bass has improved over the last four years. Very few largemouth bass under 11 in were reported as being “kept” by anglers, most were released back to the water. This suggests that even though the slot limit regulation may have been protecting fish in the 11-14 inch size class, few fish in the smaller size class were harvested making the slot limit ineffective. Based on the findings of this study, a change to the fishing regulations at Hinkson Slough may be considered.

Hinkson Historical CPUE - Largemouth Bass **Table 7**

Year	<4.9"	5-5.9"	6-7.9"	8-9.9"	10-11.9"	12-13.9"	14-15.9"	16-17.9"	18-19.9"	20-21.9"
2003	1.52	2.39	0.65							
2004	24.40	4.40	0.00	1.60	0.80	0.80				
2005	25.50	0.25	1.50	3.50	0.50					
2006	10.67	9.00	1.67	0.67		2.33	1.00	0.33		
2007	5.00	0.67	0.67	2.67	2.67	2.33	4.33	2.67		
2009	15.11	0.21	4.04	1.91	0.85	0.64	0.64	0.64	0.21	
2010	0.36	0.00	1.25	0.71	0.89	0.18	0.89			0.18
2011	0.49	0.49	3.41	0.73	2.93	2.44	1.71	0.98	0.98	
2012	12.38	4.29	1.19	2.86	0.95	0.71	0.24	0.24		

Changes to the management of largemouth and the habitat in Hinkson Slough such as removal of juvenile fish during periods of highly successful spawns and removal of aquatic vegetation through grass carp or herbicide application are likely to have contributed to the success of anglers during the past four years. These projects should be continued even if a change in regulation is adopted by the Wildlife Commission.

Study Specific Objective; Rainbow Trout Study:

Provide information to anglers regarding tagged fish with signage at Hinkson Slough throughout the year. Signs were posted around Hinkson Slough on standard T-posts prior to the fishing season advising anglers of the ongoing study.

Provide certificates of appreciation to anglers who provide tag information; certificate will include strain of fish, size at stocking, egg hatch date, source of

eggs, name of tagger, and date of stocking. In total, 236 fish were entered into the study by anglers. Certificates were sent to all anglers unless the angler requested that a certificate not be sent (several anglers provided information on over 20 individual fish and indicated that a certificate for each fish was not necessary). Angler response was positive and it is likely that they continued to participate in the study due to the ongoing information received. More than 236 tagged fish were caught, however, getting reliable and accurate data back from the anglers was not consistent. Only 3% of the fish caught by anglers were of harvestable size, therefore, all fish were released back to the water, often without the requested information being recorded. Reliable data was primarily received from anglers who were aware of what information was required prior to fishing. Anglers were prepared to document the tag number and length of each tagged fish caught before releasing it.

Monitor tagged fish through electroshocking at four established transects during one night in the fall after the close of the fishing season, one hook and line survey during angling season, and frame netting over four net nights after the angling season ends. During electrofishing surveys, 17 Tahoe strain rainbow trout and 14 Bel-Air strain rainbow trout, 14 bowcutt strain trout, and 4 Eagle Lake strain rainbow trout that had tags were captured. These fish were measured and released. Hook-and-line surveys were moderately successful and approximately 25% of fish caught had been tagged. These fish were combined with fish caught by anglers for evaluation in the study. Frame netting was unsuccessful, no tagged fish were caught.

Analyze data and write final Job Progress Report. Data was reviewed and is included in this final Job Progress Report. Combined results show the Bel-Air strain rainbow trout and bowcutt trout may be outperforming the Tahoe strain rainbow and Eagle Lake strain rainbow (Table 8).

Tagged Fish Growth and Catch Rates **Table 8**

	Tahoe Strain	Bel Air Strain	Eagle Lake	Bowcutt
Average size at stocking (in)	9.77	9.03	9.00	10.89
Average days in water	83	144	144	145
Average growth (in)	1.44	2.82	2.50	2.00
Max size (in)	15.3	18.1	15.2	17.6
% of total tags caught by anglers	4%	9%	23%	64%
Inches of growth/month	0.52	0.59	0.52	0.42
Number of fish caught by anglers	9	22	54	151
Total number of fish included in study	26	37	58	165

Average size at stocking: The average size at stocking of Bel-Air strain was smaller (which might explain the higher growth rate) and is a function of egg hatch timing (November) and the time spent in the hatchery before stocking in October (11 months). In contrast, bowcutt trout average size at stocking was the largest and egg hatch date was in July, stocking did not occur until the next October (15 months).

Average days in water: The average number of days each fish spent in Hinkson before it was measured again shows that there was no difference between bowcutt trout (145 days), Eagle Lake strain (144 days), and Bel Air strain (144 days), regarding how long into the fishing season they were caught. However, Tahoe strain fish were on average caught only 83 days after stocking and assuming all of these fish were returned

back to the water (minimum size for harvest is 16 inches) this may suggest that Tahoe strain fish were either unable to survive the warmer summer temperatures or became inactive. It is also possible that the small sample size may be influencing this parameter.

Average growth (in): Bel Air strain rainbow trout averaged the greatest growth at 2.82 inches. Eagle Lake strain was second with an average growth of 2.50 in, bowcutt trout averaged 2.00 in, and the Tahoe strain averaged 1.44 in over the study period. Some of this variation is likely due to the Bel Air strain fish being stocked at a smaller size and growing in length at a greater rate than bowcutt trout, for instance. Average size at time of catch, however, was over an inch larger for bowcutt trout (12.89 in) than size of Bel Air strain (11.85 inches), Eagle Lake strain (11.5 in), and Tahoe strain (11.21 in).

Max size (in): Even though the largest fish caught during the study was a Bel Air strain rainbow (18.1 in), 60% of fish greater than 15 in were bowcutt trout and only 22% of fish caught greater than 15 in was Bel Air strain. This suggests that the Bel Air strain has the potential to grow very large; however, on average bowcutt trout comprised the majority of “large fish” that were caught.

Percent of total tags caught by anglers: Bowcutt trout made up 64% of tagged fish caught by anglers. Eagle Lake strain was the second most encountered fish at 23%.

Inches of growth per month: Bel Air strain fish had the highest growth per month at 0.59 in. This is most likely due to the smaller size at stocking. Range of growth rates varied from 0.42 in per month for bowcutt to 0.59 for Bel Air, which is expected of trout in this highly productive water given the sizes at which each strain was stocked. There does not appear to be an advantage of one strain over the other.

Number of fish caught by anglers: Only 9 Tahoe strain were reported by anglers; conversely, 151 bowcutt trout were reported. This suggests that bowcutt trout are easier to catch, other strains were less active, or bowcutt trout were able to survive at a higher rate.

Total number of fish included in the study: This category refers to the total number of fish that were recaptured after stocking by either anglers, electrofishing, or netting. Bowcutt trout dominated with 165 fish included in the study. Only 26 Tahoe strain were recaptured.

MANAGEMENT REVIEW

All objectives and procedures were completed during 2012 with the exception of two. Catfish stocking was not conducted due to hatchery availability. Installation of a temperature logger at Hinkson Slough and FCCP was also not completed; however, temperature was collected occasionally throughout the year.

Several water management changes had taken place during 2008; these changes have been adopted as regular management practices. The most notable was the management of water movement through Hinkson Slough. Flow was maintained through Hinkson slough throughout most of the summers of 2009 through 2012, which allowed for

carryover of rainbow trout. Carryover trout were large in 2012, with several being reported by anglers of up to 23 in (up to 17.9 in during 2011, up to 20.1 in during 2010, and up to 21.7 in total length in 2009). Anglers responded by having greater satisfaction and fishing more. This is also partly due to increased angler accessibility throughout the pond resulting from increased flow and less vegetation due to triploid grass carp. Observations recorded during higher water temperatures suggest that because of reduced vegetation and constant flow-through, trout now escape to the lower depths of the pond where water temperatures are lower (up to 15 degrees Fahrenheit lower than surface temperature). Largemouth bass showed limited spawning recruitment in the spring of 2010 and 2011; however, a very successful spring spawn during 2012 was evident from electrofishing results. The large cohort from the 2009 spawn was evident from data provided by the drop-box survey and is likely the cohort at 11-14 in. Increased water clarity and high macroinvertebrate populations have allowed this cohort to survive through the summer and fall of 2012.

The other notable change in water management is the inactivity of Fort Churchill Power Plant. NV Energy uses FCCP for cooling the natural gas fired power plant. The power plant experienced periods of inactivity during 2009 through 2012 and, subsequently, water temperature has fallen considerably. Ice now has been observed covering more than 25 percent of the surface during the winter of 2010 and 2011. This is vastly different from the past 25 years of the operation where winter and spring temperatures ranged from the mid 50's to the mid 80's at the north end of the pond. This change seems to have had a negative impact on the largemouth bass and channel catfish fishing opportunities during the spring. Trout were stocked during 2012 to provide anglers with opportunity to catch fish during the cooler spring months. The FCCP management objectives should change from the "Quality Warmwater Fisheries Management Objectives" to the "General Warmwater Fisheries Management Objectives"; however, regulations should be kept consistent with the fishing series ponds.

The Hinkson Slough Rainbow Trout Study has provided valuable information needed for future selection of strains used for stocking. If maximum size is determined to be the most important characteristic, Bel Air or bowcutt strains should be stocked. If high angler catch rate is the most important characteristic, Eagle Lake strain or bowcutt trout should be stocked. If trout fishing extending further into the summer is determined to be the most important objective, then Bel Air, Eagle Lake, or bowcutt trout could be utilized.

Common carp were found in Hinkson Slough during population surveys in October 2011; during 2012, over 300 were observed. An investigation into the previous carp eradication project revealed similar population numbers from the time they were first confirmed. If past performance is used as an indicator, trout fishing is likely to drop off slightly during 2013 and then drop dramatically during the 2014 fishing season. An eradication project would then be needed during 2015.

The Hinkson Slough Largemouth Bass Study evaluated the effectiveness of the slot limit that was implemented in 2008 on bass caught within the MVWMA. The results of the study indicate that the regulation is not having the desired effect on the fishery and there may be a need to evaluate whether new regulations should be proposed. There are several options that might be considered including reinstating the regulation in effect prior to 2008, proposing an entirely new regulation, or deciding to keep the current regulation in

effect. Any evaluation of implementing new regulations should take into consideration both the biological and social implications of the proposed change.

RECOMMENDATIONS

General Management Objectives:

- Conduct a general fisheries assessment through opportunistic angler contacts, angler drop-box surveys, and mail-in, angler questionnaire data.
- Based on data collected through the ongoing surveys at Hinkson Slough, evaluate the common carp population in Hinkson Slough and develop a timeline for eradication.
- Monitor fish in Hinkson Slough through electrofishing at four established transects during one night in the fall after the close of the fishing season
- Provide information to anglers regarding on-going fishery assessments with signage at Hinkson Slough throughout the year.
- Monitor water lake level and clarity when on site.
- Install an electronic temperature sensor in Hinkson Slough and Fort Churchill Cooling Pond (FCCP)
- Stock 1,000 channel catfish in North Pond and 1,000 in FCCP.
- Augment 500 largemouth bass in Bass Pond and 500 in Crappie Pond.

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