

NEVADA DIVISION OF WILDLIFE
STATEWIDE FISHERIES MANAGEMENT



FEDERAL AID JOB PROGRESS REPORTS

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2012

Lincoln County Reservoirs
SOUTHERN REGION



**NEVADA DEPARTMENT OF WILDLIFE, FISHERIES DIVISION
JOB 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: Lincoln County Reservoirs
Period Covered: January 1, 2012 through December 31, 2012

SUMMARY

Random creel surveys were conducted during 2012 in conjunction with other activities at Eagle Valley and Echo Canyon reservoirs. There were a total of 10 anglers contacted at Eagle Valley Reservoir and 26 anglers contacted at Echo Canyon Reservoir. The 2012 catch rate for Eagle Valley Reservoir was 4.2 fish per angler and 1.4 fish per angler hour. The 2012 catch rate for Echo Canyon Reservoir was 4.6 fish per angler and 2.6 fish per angler hour.

Angler creel drop-boxes were installed at Echo Canyon and Eagle Valley reservoirs in 2012. These boxes were used to collect voluntary information from anglers who were not contacted by a creel clerk. There were 66 creel survey forms collected from Echo Canyon and 61 from Eagle Valley in 2012. Volunteer data reported 704 fish caught in Echo Canyon and 472 from Eagle Valley in 2012. The catch rate for Echo Canyon Reservoir was 10.7 fish per angler and 2.8 fish per hour. The catch rate for Eagle Valley Reservoir was 7.7 fish per angler and 2.01 fish per hour. The harvest rate was 4 fish per angler and 1.05 fish per hour for Echo Canyon and 2 fish per angler and 0.55 fish per hour for Eagle Valley Reservoir.

Monitoring was conducted for quagga mussels (*Dreissena bugensis*) in Eagle Valley and Echo Canyon reservoirs. Other work efforts focused on repairs to and maintenance of the Eagle Valley Reservoir aeration system, maintaining water releases from Eagle Valley Reservoir, and completing reports and data organization.

Trout were stocked into Eagle Valley and Echo Canyon reservoirs in the spring and fall. There was 42,500 rainbow trout (*Oncorhynchus mykiss*) averaging 8.9 in (TL), 7,634 brown trout (*Salmo trutta*) averaging 7.1 in (TL) and 4,459 tiger trout (*Salmo trutta* x *Salvelinus fontinalis*) averaging 10.1 in (TL) stocked in Eagle Valley Reservoir. A total of 17,447 rainbow trout averaging 8.8 in (TL) were stocked into Echo Canyon Reservoir.

An electroshocking survey was completed at Beaver Dam Creek, an area once occupied by Schroeder Reservoir, for population assessment of sport fish. Rainbow trout averaged 5.5 in, TL. The density of trout through this area was 342 fish per mile (mi). A total of 2,088 rainbow trout averaging 9.1 in were stocked into Beaver Dam Creek in 2012.

BACKGROUND

Four reservoirs in Lincoln County provide coldwater and warmwater fishing opportunities; Eagle Valley and Echo Canyon reservoirs in the Spring Valley area near Pioche, Nesbitt Lake on the Key Pitman Wildlife Management Area (WMA) in Pahranaagat Valley, and Upper Pahranaagat Lake on the Pahranaagat National Wildlife Refuge (NWR). Eagle Valley Dam was constructed on Eagle Valley Creek in 1965. The dam, constructed in a narrow canyon below several miles of meadow, created Eagle Valley Reservoir of approximately 61 surface acres, which is managed primarily as a put-and-take rainbow trout fishery. Eagle Valley Creek is the upper extension of Meadow Valley Wash and the primary water source supplying Eagle Valley Reservoir. Habitat conditions have deteriorated because of periodic livestock grazing. There is a mixture of public and private lands in the stream above the reservoir and recent land exchanges have allowed the consolidation of the majority of the stream into State ownership, which has substantially reduced effects from excessive and unregulated livestock use. This has increased the potential to effectively implement restoration efforts.

The 70 acre Echo Canyon Reservoir was constructed in 1969 in Meadow Valley Wash, approximately 10 mi downstream from Eagle Valley Reservoir. This impoundment is managed for stocked rainbow trout and self-sustaining populations of largemouth bass (*Micropterus salmoides*) and white crappie (*Pomoxis annularis*).

Nesbit Lake on the Key Pitman WMA is managed primarily for waterfowl, but maintains a self-sustaining fishery for largemouth bass and black bullhead (*Ameiurus melas*). Upper Pahranaagat Lake is the primary storage facility for water management on the Pahranaagat NWR in lower Pahranaagat Valley. This reservoir traditionally supported largemouth bass, bluegill (*Lepomis macrochirus*), and other warm-water species, but has been periodically dried over the past several years due to ongoing repair work to its dam and currently provides limited sport fishing benefits.

Beaver Dam Wash in Lincoln County is located almost entirely within Beaver Dam Wash State Park and, until 2005, provided both stream fishing opportunities and a reservoir fishery at Schroeder Reservoir, all for stocked rainbow trout. In 2005, extreme high flow events caused the loss of Schroeder Dam and Schroeder Reservoir and substantially altered in-channel and riparian habitats along Beaver Dam Wash. Subsequently, planning and design has been completed to remove remnant parts of the old dam and implement riparian restoration actions.

OBJECTIVES AND APPROACHES

Lincoln County Reservoirs General Sport Fisheries Management

Objective: Monitor angler use, catch rates, and changes in the fish population dynamics. Develop and analyze information on fishery conditions to develop annual

coldwater stocking recommendations and identify future changes in management prescriptions.

Approaches:

- Manage reservoir warmwater and stocked rainbow trout fisheries to meet management objectives as general or put-grow-and-take waters.
- Monitor fish populations and angler performance at levels necessary to validate management prescriptions and identify necessary management actions.
- Coordinate reservoir management to insure compatibility with fishery requirements and agricultural water user needs.
- Protect, maintain, and enhance reservoir aquatic habitat and water quality.
- Implement strategies to minimize impacts to the fisheries from invasive aquatic species.

Eagle Valley Creek Restoration

Objectives: Complete a written restoration plan for Eagle Valley Creek in coordination with Spring Valley State Park (SVSP) and implement initial actions for enhancing bank stability and riparian cover.

Approaches:

- Complete a restoration plan for Eagle Valley Creek in coordination with Spring Valley State Park (SVSP) and implement initial actions for enhancing bank stability and riparian cover.

Beaver Dam Wash Fishery Evaluation

Approaches:

- Describe the current structure and condition of the fishery in Beaver Dam Wash. Insure that site restoration actions are designed and implemented to maximize benefits for resident sport and native fishes in Beaver Dam Wash.

PROCEDURES

Lincoln County Reservoirs General Sport Fisheries Management

1. Conduct a general fisheries assessment through opportunistic angler contacts at all four Lincoln County reservoirs.
2. Develop and maintain volunteer angler drop-boxes at Nesbit Lake, Upper Pahranaagat Lake, and Echo Canyon Reservoir.

3. Monitor and maintain the aeration system and water inflow/outflow conditions at Eagle Valley Reservoir
4. Complete a spring electroshocking survey at Echo Canyon Reservoir to assess trout overwintering growth and survival, and warmwater species population structure and recruitment.
5. Coordinate water management and reservoir needs with the Key Pitman WMA manager for Nesbit Lake and with Pahranaagat NWR for Upper Pahranaagat Lake
6. Assist Pahranaagat NWR with the development of a comprehensive fisheries management plan and a nuisance aquatic species control plan for the refuge
7. Conduct fisheries surveys on waters of Pahranaagat NWR using hoop or trammel nets and electroshocking to provide information for use in refuge planning efforts for aquatic habitats
8. Provide sport fishery information to anglers directly and through NDOW channels.
9. Implement strategies for early detection and long term monitoring of quagga mussels and other invasive species consistent with NDOW Southern Region and statewide aquatic invasive species plans
10. Implement strategies to prevent introduction and spread of quagga mussels through signage, information delivery, and angler/boater contacts.

Eagle Valley Creek Restoration

1. Complete a written restoration plan for Eagle Valley Creek in coordination with SVSP.
2. Implement bank stabilization measures and establishes native vegetation to improve riparian cover along 10% of the creek within SVSP in the first year

Beaver Dam Wash Fishery Evaluation

1. Assist NDSP and contractors in the development of a management and restoration plan.
2. Conduct stream surveys by electroshocking once during the summer and develop a fish population assessment utilizing accepted NDOW methodology to meet information needs for the development of management and planning strategies.
3. Evaluate management alternatives and opportunities in coordination with NDSP and determine future management direction.

FINDINGS

Lincoln County Reservoirs General Sport Fisheries Management

Eagle Valley Reservoir

Creel survey data for 1993 through 2012 is summarized in Table 1. Creel survey, primarily to determine angler catch rates, was conducted on a random basis associated with other activities at the reservoir. Ten anglers were contacted during the reporting period. These anglers fished for 30.5 hours catching 42 fish resulting in catch rates of 4.2 fish per angler. Fifteen fish were harvested resulting in a rate of 1.5 fish per angler. Tiger trout are a significant asset to the fishery but were not stocked in 2011. They were stocked in 2012, but did not show up in the creel. Tiger trout averaged about 10 percent of the harvest in the three years that data has been available and are popular with anglers. Brown trout rarely exceed five percent of the observed harvest except in 2004. A volunteer angler questionnaire box was installed in 2012 and will provide some additional useful information, particularly to assess angler success outside of the peak use periods.

Table 1. Eagle Valley Reservoir Creel Census Summary, 1995-2012.

Year	Days Checked	Anglers Checked	Fish Checked			Average TL (in)			Angler Hours	Fish per Angler	Fish per Hour
			RB	BN	TT	RB	BN	TT			
1995	15	437	705	30		10.3	11.6		1,688.5	1.9	0.7
1996	18	300	633	39		10.5	10.8		1,056.5	2.2	0.6
1997	18	298	409	17		10.4	9.6		760.0	1.4	0.6
1998	15	184	482	33		10.4	10.6		581.5	2.8	0.9
1999	12	220	525	35		11.3	11.1		789.0	2.6	0.7
2000	10	214	408	23		10.2	9.9		810.5	2.0	0.5
2001						No Data					
2002	3	70	89			N/D			N/D	1.8	0.5
2003	8	96	168			N/D			336.0	1.8	0.5
2004	10	100	175	25		N/D	N/D		402.0	2.0	0.5
2005	12	200	500			N/D			634.0	2.5	0.8
2006	12	120	210		32	N/D		N/D	483.0	2.0	0.5
2007	8	56	86		18	N/D		N/D	185.0	1.9	0.6
2008						No Data					
2009						No Data					
2010	N/D	52	110		14	11.9		11.1	51.0	2.4	2.4
2011	N/D	31	44		4	10.8		12.3	26.5	1.5	1.8
2012	N/D	10	40		2	11.8		12.1	30.5	4.2	1.4

RB = rainbow trout, BN = brown trout, TT = tiger trout, N/D = no data

Creel forms from the angler drop-box were completed by 61 anglers who expended 234.5 hours catching 472 fish, of which 470 were trout and two were largemouth bass. The average catch rate was 7.7 fish per angler/day with a reported harvest of 2 fish per angler/day. In 2012, 465 trout were measured and recorded, of those, 348 or 75% were below 12 in, TL, and 116 or 25% were between 12 and 18 in, TL. Four largemouth bass less than 10 in were caught from Eagle Valley Reservoir.

Table2. Eagle Valley Reservoir Fish Stocking Summary, 1995-2012.

Year	Rainbow Trout	Brown Trout	Tiger Trout
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	#	Pounds	F/P	Avg. TL (in)	#	Pounds	F/P	Avg. TL (in)	#	Pounds	F/P	Avg. TL (in)
1995	41,950	11,196	3.8	8.9	4,003	834	4.8	8.5	0	0	NA	NA
1996	56,769	19,144	3.0	9.3	4,000	1,538	2.6	10.0	0	0	NA	NA
1997	45,932	14,228	2.6	10.0	4,000	1,250	2.4	10.0	0	0	NA	NA
1998	36,458	14,643	2.6	10.0	3,000	1,250	2.4	10.0	0	0	NA	NA
1999	42,259	19,093	2.2	9.8	4,000	1,176	3.4	9.0	0	0	NA	NA
2000	48,467	16,908	2.9	9.5	5,000	1,515	3.3	9.0	0	0	NA	NA
2001	48,726	15,368	3.2	9.2	5,000	1,150	4.3	8.5	0	0	NA	NA
2002	48,915	15,830	3.1	9.3	4,000	1,333	3.0	9.5	0	0	NA	NA
2003	47,367	15,057	3.4	9.0	4,085	1,075	3.8	9.0	0	0	NA	NA
2004	26,305	7,175	3.7	8.8	4,575	1,709	2.7	10.2	0	0	NA	NA
2005	34,285	9,250	3.7	8.8	0	0	NA	NA	0	0	NA	NA
2006	44,467	11,100	4.0	8.5	0	0	NA	NA	5,000	1,860	2.7	10.0
2007	35,992	10,825	3.2	9.4	0	0	NA	NA	5,024	1,275	3.9	8.6
2008	41,970	11,730	3.6	8.8	0	0	NA	NA	20,027	1,294	15.5	
2009	39,587	11,803	3.4	9.0	0	0	NA	NA	5,034	777	6.5	
2010	39,008	10,565	3.7	8.8	0	0	NA	NA	4,999	1,721	2.9	
2011	44,068	12,309	3.6	8.9	0	0	NA	NA	0	0	NA	
2012	42,500	12,600	3.4	9.1	7,634	1,100	6.9	7.1	4,459	1,850	2.4	10.1

F/P = fish per pound

Time was spent at Eagle Valley Reservoir in summer 2012 working with Nevada Division of State Parks (NDSP) to repair and maintain the reservoir aeration system. Water releases from Eagle Valley Reservoir were monitored and adjusted in accordance with the water right operating agreement.

Fixed samplers and visual/tactile transects to monitor for adult quagga mussels were maintained and checked during the summer months. No adult mussel presence was noted. Plankton tows to identify mussel veliger presence were completed in May. There were two sites on the reservoir sampled with three tows per site. Samples were sent out for lab analysis and no mussel veligers were detected.

Nearly 43,000 rainbow trout, 4,500 tiger trout, and 8,000 brown trout were stocked into Eagle Valley Reservoir in 2012. Rainbow trout averaged 9.1 in, tiger trout averaged 10.1 in, and brown trout averaged 7.1 in. Table 2 summarizes trout stocking since 1995.

Echo Canyon Reservoir

Creel survey was conducted in conjunction with other activities at the reservoir. Most creel contacts occurred during the spring when angling was at its best and 26 anglers were contacted. These anglers fished for 46.25 hours catching 120 fish resulting in catch rates of 4.6 fish per angler/day and 2.6 fish per hour. Table 3 summarizes the creel survey findings for Echo Canyon Reservoir since 1998.

Table 3. Echo Canyon Reservoir Creel Census Summary, 1998-2012.

Year	Days	Anglers	Hours	Total	.# Fish	Avg. TL (in)	%Harvest	F/A	F/H
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		Fish													
		RB	WC	LMB	RB	WC	LMB	RB	WC	LMB	RB	WC	LMB		
					40	92									
1998	8	199	783.5	614				ND	ND	78.5	6.5	3.1 0.8			
1999	11	127	469	462	419	19	24	ND	ND	ND	90.7	4.1	5.2	2.9	1.0
2000	13	215	765	486	347	59	80	ND	ND	ND	71.4	12.1	16.5	2.3	0.6
2001					No Data										
					38	10	15								
2002	8	20	80	51				ND	ND	ND	75.0	10.0			
2003	8	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2004	11	75	123	345	270	17	24	ND	ND	ND	5.0	78.0	7.0	4.6	2.8
					180	65	62								
		9	35	108	307			ND	ND	ND			20.0	8.8	
2006	8	200	798	612	480	43	89	ND	ND	ND	78.0	7.0	15.0	3.0	0.8
2007	10	55	190	227	135	20	72	ND	ND	ND	60.0	9.0	31.0	4.1	
2008								No Data							
2010	ND	18	33.5	85	81	1	3	9.4			1	ND	ND	4.7	
2011	ND	23	40.5	87	58	26	3	10.2	9.0	8.7	ND	ND	ND	3.8	2.1
					81	30	9		11.3	9.7					
2012	ND	26	46.3	120						8.4	ND	ND	ND	2.6	

RB = rainbow trout, WC = white crappie, LMB = largemouth bass, ND = no data, F/A = fish per angler, F/H = fish per harvest

A volunteer angler drop-box was installed in 2012 to provide additional useful information, particularly to assess angler success outside of peak use. Volunteer creel forms were completed by 66 anglers, who expended 249 hours catching 704 fish, of which 483 were trout, 187 were largemouth bass, and 34 were white crappie. The average angler catch rate was 10.7 fish per angler/day with a harvest of 4 fish per angler. In 2012, 403 rainbow trout were measured and recorded, of those 323 or 80% were below 12 in and 80 or 20% were between 12 and 18 in. Anglers caught 148 largemouth bass and of those 119 or 80% were less than 10 in and 29 or 20% were larger than 10 in. There were 33 white crappie caught and of those 26 or 79% were less than 8 in and 7 or 21% were larger than 8 in.

Fixed samplers and visual/tactile transects for quagga mussel detection were maintained and checked for adult quagga mussel presence during the summer months. No adult mussel presence was noted.

Over 17,000 rainbow trout were stocked into Echo Canyon Reservoir in 2012 that averaged 8.8 in. Table 4 summarizes rainbow trout stocking at Echo Canyon since 1996.

Table 4. Echo Canyon Reservoir Rainbow Trout Stocking Summary 1996-2012

Year	Number	Pounds	Fish/Pound	Avg. TL (in)
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1996	13,371	5,049	2.7	10.0
1997	12,930	4,700	2.8	9.8
1998	26,405	11,200	2.4	10.1
1999	20,687	8,770	2.4	10.0
2000	21,862	6,702	3.3	9.1
2001	17,405	5,891	3.0	9.4
2002	9,552	2,400	4.0	8.6
2003	13,220	4,222	3.1	9.0
2004	11,035	2,675	4.1	8.5
2005	13,725	4,250	3.2	9.5
2006	19,089	4,076	4.7	8.4
2007	18,499	5,455	3.2	9.2
2008	19,820	5,250	3.8	8.7
2009	15,264	4,643	3.3	9.0
2010	20,178	5,439	3.7	8.8
2011	20,280	6,464	3.1	9.3
2012	17,447	4,715	3.7	8.8

Upper Pahranaagat/ Nesbit Lakes

Fish population monitoring at Nesbit Lake was not completed because of time constraints. Upper Pahranaagat Lake was drained in 2007, then refilled during the winter period and drained again in summer 2008 for repair to the dam structure. Current water management strategies on the refuge since 2008 have generally resulted in very low storage levels during late summer and fall. Warm water fish species have not been restocked in the reservoir pending a decision from the refuge on future management direction. Although there are common carp (*Cyprinus carpio*) and bullheads in the reservoir, the reservoir does not contain a sport fishery.

Assistance was provided to Pahranaagat NWR staff to develop a Fisheries Management Plan for the refuge including Upper Pahranaagat Lake; this process will be continued in 2013.

Plankton tows to identify quagga mussel veliger presence were not conducted during the reporting period. No static samplers, visual/tactile transects or veliger tows were maintained or conducted at Upper Pahranaagat Lake due to the short duration of water storage during the year and lack of a viable sport fishery.

Eagle Valley Creek Restoration

Through a land exchange with the Lytle Ranch, State owned land now continuous exist from the State Parks headquarters office above Eagle Valley Reservoir

to the confluence of the reservoir and Eagle Valley Creek. Work will begin to restore the stream into a single channel and develop the riparian vegetation. Summer stream temperatures should be reduced when flowing into the reservoir. Assistance was given to NDSP to develop a Restoration and Management Plan and to identify funding for these actions. A final plan is soon expected to be completed and approved by NDSP.

Beaver Dam Wash Fishery Evaluation

Restoration activity and removal of the dam were completed at the site of Schroeder Reservoir during the fall of 2009. In December 2010, heavy rainfall resulted in a large flood event that moved down the Beaver Dam Wash. All the restoration that was completed in 2009 was washed away along with large amounts of sediment from the old reservoir site. At this time no decision has been made by NDSP on future management of the old impoundment or on any effort to initiate additional restoration.

Over 2,000 rainbow trout averaging 9.1 in were stocked into the creek during the spring.

An electroshocking survey in the creek once occupied by Schroeder Reservoir was completed in August 2012. Three hundred forty-two rainbow trout were captured during the survey with an average length of 5.5 in. All fish captured were returned to the creek.

MANAGEMENT REVIEW

A new aeration system was purchased and installed in Eagle Valley Reservoir in 2012 and efforts to assist with a restoration plan for Eagle Valley Creek will be ongoing through 2013. Efforts to complete and implement even minimal restoration along the creek have been challenging because of NDSP concerns that restoring ecological function to the creek could interfere with contract livestock grazing, and that restoring native riparian vegetation could attract ESA listed bird species, although the site is likely out of the range occupied by southwestern willow flycatchers (*Empidonax traillii extimus*). An additional concern is that increased densities of livestock use on State lands above the reservoir could be contributing to both water quality and sedimentation issues in the upper parts of Eagle Valley Reservoir.

The manager of SVSP has expressed a desire to augment the fishery of Eagle Valley Reservoir with largemouth bass. Stocking largemouth bass may be a good idea because of the potential of an underutilized prey species in golden shiner (*Notomigonus crysoleucas*). A closer look at the species composition of the reservoir will be needed before any stocking would occur.

With completion of dam repairs at Upper Pahranaagat Lake in 2009, staff will work with Pahranaagat NWR to identify future management direction. It is hoped that a winter put-and-take trout fishery can be established in upper Pahranaagat Lake in 2013.

RECOMMENDATIONS

1. Conduct a general fisheries assessment through opportunistic angler contacts at all four Lincoln County reservoirs.
2. Develop and maintain volunteer angler drop-boxes at Nesbit Lake and Upper Pahranaagat Lake.
3. Install and maintain the new aerator system and water inflow/outflow conditions at Eagle Valley Reservoir.
4. Continue to pursue strategies for restoration on Eagle Valley Creek in cooperation with NDSP staff.
5. Complete a spring gillnetting survey at Echo Canyon Reservoir to assess trout overwintering growth and survival and population structure and recruitment of warm water species.
6. Coordinate water management and reservoir management needs with the Key Pitman WMA manager for Nesbit Lake and with Pahranaagat NWR for Upper Pahranaagat Lake.
7. Assist Pahranaagat NWR with the development of a comprehensive Fisheries Management Plan and a Nuisance Aquatic Species Control Plan for the refuge.
8. Conduct fisheries surveys on waters of Pahranaagat NWR using hoop or trammel nets and electroshocking to provide information for use in refuge planning efforts for aquatic habitats.
9. Provide sport fishery information to anglers directly and through NDOW channels.
10. Implement strategies for early detection and long term monitoring for quagga mussels and other invasive species consistent with NDOW Southern Region and statewide aquatic invasive species plans.
11. Implement strategies to prevent introduction and spread of quagga mussels through signage, information delivery, and angler/boater contacts.
12. Collect at least five of each sport fish species for mercury analysis in cooperation with NDEP at Nesbit Lake.
13. Conduct stream survey on Beaver Dam Creek by electroshocking once during the summer and develop a fish population assessment utilizing accepted NDOW methodology to meet information needs for the development of management and planning strategies. Marking of stocked rainbow trout should be considered to differentiate from natural recruitment during sampling.
14. Conduct fall electroshocking and/or gillnetting survey of Eagle Valley Reservoir to look at species composition to determine if stocking largemouth bass is warranted.

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