

NEVADA DIVISION OF WILDLIFE  
STATEWIDE FISHERIES MANAGEMENT



FEDERAL AID JOB PROGRESS REPORTS

F-20-49  
2013

Kirch Wildlife Management Area  
SOUTHERN REGION



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

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JOB PROGRESS REPORT**

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

**State:** Nevada  
**Project Title:** Statewide Fisheries Program  
**Job Title:** Kirch Wildlife Management Area  
**Period Covered:** January 1, 2013 through December 31, 2013

**SUMMARY**

Random creel surveys were conducted during 2013 in conjunction with other activities on the Kirch Wildlife Management Area (WMA). There were 10 anglers contacted throughout the Kirch WMA. The 2013 combined catch rate for all four reservoirs and all sport fish species was 3.4 fish per angler (fish/angler) and 0.83 fish/angler hour. The fish harvested and observed in the creel or reported by anglers were rainbow trout *Oncorhynchus mykiss* and largemouth bass *Micropterus salmoides*.

Three volunteer angler creel drop-boxes were installed at Adams-McGill, Haymeadow, and Cold Springs reservoirs in 1996 and one at Dacey Reservoir in 2007. These boxes were used to collect voluntary information from anglers who were not contacted by a creel clerk. Drop-boxes collected 117 creel survey forms in 2013. Volunteer data showed 1,374 fish caught, with 1,012 or 74% reported as released. The combined catch rate for the four reservoirs was 11.7 fish/angler and 2.6 fish/angler hour, and the reported harvest rate was 3.1 fish/angler and 0.7 fish/angler hour.

Spring electroshocking surveys were conducted with the help of Kirch WMA personnel. Cold Springs and Haymeadow reservoirs were surveyed by electroshocking. Adams-McGill and Dacey reservoirs were not sampled due to inclement weather and electroshocking boat availability.

Rainbow trout were stocked into Cold Springs, Haymeadow, and Adams-McGill reservoirs in the spring and fall. A total of 19,605 rainbow trout averaging 8.0 inches (in) [203 millimeters (mm)] total length (TL) were stocked into Adams-McGill Reservoir. A total of 63,785 rainbow trout averaging 8.8 in (224 mm) TL were stocked into Cold Springs Reservoir. The total rainbow trout stocked into Haymeadow Reservoir was 66,002 averaging 8.7 in (221 mm) TL. An additional 10,675 rainbow trout averaging 7.3 in (185 mm) TL were stocked into Dacey Reservoir.

Monitoring was conducted for quagga mussels *Dreissena bugensis* on all four reservoirs. Visual and tactile transects were negative for adult mussels. Plankton tows to sample for mussel larvae or "veligers" also came up negative. Efforts to coordinate reservoir water management were maintained with Kirch WMA personnel.

## **BACKGROUND**

Wayne E. Kirch Wildlife Management Area, located in the White River drainage of eastern Nye County, contains five reservoirs totaling 1,589 surface acres. Adams-McGill is the largest at 785 surface acres; Cold Springs at 275, Tule at 154, Haymeadow at 190, and Dacey at 185 acres. Water sources for the Kirch WMA include the Flag Springs-Sunnyside Creek system, Hot Creek Spring system (both provide year-round water supply), and the White River drainage (supplies water during spring and large rain events).

All reservoirs are shallow, with surface water temperatures ranging from freezing in the winter to the mid-70's°Fahrenheit (22-25° Centigrade) in the summer. The reservoirs have a naturally sustaining largemouth bass fishery and an artificially propagated rainbow trout fishery. Black bullhead *Ameiurus melas* and white crappie *Pomoxis nigromaculatus* are believed to have been introduced illegally.

## **OBJECTIVES and APPROACHES**

### **Kirch WMA General Sport Fisheries Management**

Objectives: 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 black bass and stocked rainbow trout fisheries to meet management objectives as general or quality 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 and waterfowl management objectives.
- Implement strategies to minimize impacts to the fisheries from avian predation and invasive aquatic species.
- Conduct a general fisheries assessment through opportunistic angler contacts at all four Kirch WMA reservoirs.
- Maintain volunteer angler drop-boxes at Dacey, Adams-McGill, Haymeadow, and Cold Springs reservoirs.
- Coordinate water management and reservoir management needs with the Kirch WMA manager and update the fisheries management sections of the Kirch WMA Conceptual Management Plan (CMP) in cooperation with the Kirch WMA manager as required.

- Continue implementation of bird predation control strategies through the management of unoccupied bird habitat and adjustments to trout stocking strategies.
- Provide sport fishery information to anglers directly and through NDOW channels.
- 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.
- Implement strategies to prevent introduction and reduce spread of quagga mussels through signage, information delivery, and angler/boater contacts.

### Kirch WMA Black Bass Evaluation

Objectives: Describe the current structure and condition of the Kirch WMA largemouth bass fishery and examine if changes are needed in existing largemouth bass harvest regulations.

Approaches:

- Evaluate black bass catch and harvest data from volunteer angler drop-box responses at Dacey, Adams-McGill, Haymeadow, and Cold Springs reservoirs.
- Complete a spring electroshocking survey at Dacey and Adams-McGill reservoirs to assess rainbow trout overwintering growth and survival, and other warm-water species population structure and recruitment.
- Complete a spring electroshocking or hoop/gillnet survey at Haymeadow and Cold Springs reservoirs to assess rainbow trout overwintering growth and survival, and other warm-water species population structure and recruitment
- Evaluate existing and new data on the black bass population in the reservoirs and identify possible changes in black bass harvest regulations that would benefit the fishery.

### Dacey Reservoir Trophy Fishery Evaluation

Objectives: Evaluate angler preference regarding management strategy change, specifically towards developing a special harvest regulation at Dacey Reservoir. Additionally, examine the potential for Dacey Reservoir to support a Trophy or Quality Fishery Management Concept.

## Approaches:

- Stock up to 3,000 rainbow trout annually at a minimum size of 9 in (229 mm) TL during late fall.
- Conduct an electroshocking survey annually in the spring to evaluate age structure and species composition of the sport fishery.
- Collect basic water quality data semi-annually (April and October) to evaluate the potential effects of waterfowl and water management strategies.
- Collect angler success and satisfaction data through direct contact creel surveys at least twice a month from August to October and to maintain a volunteer, angler drop-box.

## PROCEDURES

### Kirch WMA General Sport Fisheries Management

Two days of creel surveys were conducted opportunistically at Dacey Reservoir, one day at Adams-McGill Reservoir, and two days at Cold Springs Reservoir. Angler drop-boxes were checked monthly at all four reservoirs. Data recorded consisted of fish species caught, number of fish kept and released, total lengths and weights of fish, and angler origin. All data was entered and maintained in a database.

Electroshocking surveys were not conducted on Dacey and Adams-McGill reservoirs in 2013 due to electroshocking boat and area biologist availability. Twenty-eight hours (hrs) at Dacey Reservoir and 18 hrs at Adams-McGill Reservoir were spent conducting hook-and-line surveys to compensate for the lack of electroshocking surveys. An electroshocking survey was completed in May on Cold Springs and Haymeadow reservoirs using a Clark boat equipped with Coffelt shocking equipment and a Smith Root Variable Voltage Pulsator Electrofisher, Model VVP-15B. Methodology used is described in the NDOW's Sport Fish Sampling Guidelines for Lakes, Ponds, and Reservoirs. Fish were identified to species, measured to total length, weighed, and released back to the reservoirs. Cold Springs Reservoir was electroshocked for 0.47 hrs and Haymeadow Reservoir for 0.73 hrs.

Fixed substrate samplers were maintained and visual/tactile transects completed for adult quagga mussel detection in June and September at all four reservoirs. Plankton tows were conducted in July at all four reservoirs. Kirch WMA personnel visually monitored the reservoirs for avian predators.

### Kirch WMA Black Bass Evaluation

Two days of creel surveys were conducted opportunistically at Dacey Reservoir, one day at Adams-McGill Reservoir, and two days at Cold Springs Reservoir. Angler drop-boxes were checked monthly at all four reservoirs. Data recorded consisted of fish

species caught, number of fish kept and released, total lengths and weights of fish, and angler origin. All data was entered and maintained in a database.

Electroshocking surveys were not conducted on Dacey and Adams McGill reservoirs in 2013 due to electroshocking boat and area biologist availability. Twenty-eight hours at Dacey Reservoir and 18 hrs at Adams-McGill Reservoir were spent conducting hook-and-line surveys to compensate for the lack of electroshocking surveys. An electroshocking survey was completed in May on Cold Springs and Haymeadow reservoirs, using a Clark boat equipped with Coffelt shocking equipment and a Smith Root Variable Voltage Pulsator Electrofisher Model VVP-15B using methodology described in the NDOW's Sport Fish Sampling Guidelines for Lakes, Ponds, and Reservoirs. Fish were identified to species, measured to total length, weighed, and released back to the reservoirs. Cold Springs Reservoir was electroshocked for 0.47 hrs and Haymeadow Reservoir for 0.73 hrs.

### Dacey Reservoir Trophy Fishery Evaluation

Two days of creel surveys were conducted opportunistically at Dacey Reservoir. Angler drop boxes were checked monthly. Data recorded consisted of fish species caught, number of fish kept and released, total lengths and weights of fish, and angler origin. All data was entered and maintained in a database.

Twenty-eight hours of hook-and-line surveys were conducted throughout the year. Fish were identified to species, measured to total length, weighed, and released back to the reservoir.

## **FINDINGS**

### Kirch WMA General Sport Fisheries Management

#### Adams-McGill Reservoir

Opportunistic creel surveys were conducted in conjunction with other activities on the Kirch WMA. Four anglers were contacted at Adams-McGill in 2013. Table 1 summarizes contact creel data from 1996 to present.

Volunteer angler drop-box creel data forms were completed by 38 anglers who expended 176.5 hrs to catch 372 fish, of which, 167 were rainbow trout and 202 were largemouth bass. The average reported catch rate was 9.8 fish/angler with a reported harvest of 2.9 fish/angler. In 2013, 170 rainbow trout were measured and recorded, of those, 40 or 24% were below 12 in (305 mm) TL, 79 or 46% were between 12 and 16 in (305-406 mm) TL, and 51 or 30% were above 16 in (406 mm) TL. One hundred sixty-four largemouth bass were measured and recorded on Adams-McGill Reservoir. Of those, 101 or 62% were less than 12 in (305 mm) TL, 36 or 22% were between 12 and 14 in (305-356 mm) TL, and 27 or 16% were above 14 in (356 mm) TL. Harvest and catch rates calculated from the volunteer creel data are summarized in Table 2.

A total of 19,605 rainbow trout averaging 8.0 in (203 mm) TL were stocked into Adams-McGill reservoir in 2013. Table 3 summarizes the rainbow trout stocking since 2003.

Table 1. Adams-McGill Reservoir Contact Creel Data Summary, 1996-2013

Year	Catch Rates		Average TL (in)			Comments
	Fish/Ang.	Fish/Hr.	RB	LMB	UK	
1996	3.56	0.75			11.7	
1997	3.59	0.85			11.2	
1998	3.56	1.35			11.8	
1999	1.78	0.44			11.9	
2000	2.17	0.54			10.5	
2001	No Creel Data Available					Reservoir Dewatering
2002	No Creel Data Available					Reservoir Dewatered
2003	No Creel Data Available					Reservoir Dewatered
2004	2.25	1.25	13.5	12.5		Creel was conducted twice and contacted 2 parties fishing from shore.
2005	2.25	1.00	14.0	11.8		Most anglers after trout
2006	2.16	0.85	15.0	11.9		Most anglers fly fishing for trout
2007	No Creel Data Available					
2008	No Creel Data Available					
2009	No Creel Data Available					
2010	2.75	2	15.0	11.0		none
2011	No Creel Data Available					
2012	6.2	3.54	12.7	11.0		Most anglers after trout
2013	3	0.75	13.6	13.5		none

RB = rainbow trout, LMB = largemouth bass, UK = unknown-species not noted

Table 2. Adams-McGill Reservoir Volunteer Creel Survey Data, 1996-2013.

Year	# Fish Captured	# Fish Released	% Fish Released	# Fish Harvested	% Fish Harvested	Fish/Angler		Fish/Hour	
						Catch	Harvest	Catch	Harvest
1996	254	208	82	46	18	No Data Available			
1997	376	324	86	52	14	14.5	2.0	3.06	0.42
1998	65	56	86	9	14	10.83	1.50	2.50	0.35
1999	52	36	69	16	31	5.78	1.78	1.25	0.39
2000	97	53	55	44	45	9.70	5.30	1.41	0.77
2001	No Creel Data Available								
2002	No Creel Data Available								
2003	No Creel Data Available								
2004	49	35	71	14	29	8.3	2.3	4.9	1.4
2005	105	75	73	30	28	9.3	2.4	4.5	1.3
2006	235	134	57	101	43	8.5	2.0	3.5	1.0
2007	117	63	53.8	54	46.1	3.0	2.5	0.7	0.6

Table 2, Continued. Adams-McGill Reservoir Volunteer Creel Survey Data, 1996-2013.

Year	Total Fish Captured	# Fish Released	% Fish Released	# Fish Harvested	% Fish Harvested	Fish/Angler		Fish/Hour	
						Catch	Harvest	Catch	Harvest
2008	No Creel Data Available								
2009	327	327	100	0	0	65.4	No Data	9.6	0
2010	37	30	81	7	19	12.3	2.33	3.22	1.64
2011	95	42	44	7	1	7.9	1	1.54	0.11
2012	290	213	73	77	27	16	4.3	3.6	0.95
2013	372	258	69	114	31	9.8	3	2.1	0.65

Table 3. Adams-McGill Reservoir Trout Stocking Summary, 2003-2013.

Year	Number of Trout	Total Weight (pounds)	Average TL (in)
2003	16,582	No Data	9.0
2004	28,112	6,604	8.5
2005	27,931	5,066	7.6
2006	22,000	5,296	8.4
2007	3,298	4,623	9.2
2008	25,362	4,925	7.5
2009	8,067	No Data	9.0
2010	8,120	1,400	7.6
2011	8,160	1,700	8.0
2012	12,160	3,500	9.0
2013	19,605	3,650	8.0

### Cold Springs Reservoir

Opportunistic creel surveys were conducted during 2013 in conjunction with other activities on the Kirch WMA. Four anglers were contacted on Cold Springs Reservoir in 2013. Table 4 summarizes contact creel data from 1996 to present.

Table 4. Cold Springs Reservoir Contact Creel Data Summary, 1996-2013.

Year	Days Creel	# Anglers	Total Hours	RB		LMB		Fish/Angler	Fish/Hour
				#	Avg. TL (in)	#	Avg. TL (in)		
1996	20	127	471.5	177	14.2	2	11.0	2.20	0.59
1997	22	102	361.5	153	14.4	0	-	1.50	0.42
1998	7	50	199.5	59	13.7	54	13.0	2.26	0.57
1999	11	143	643.5	171	13.1	36	11.5	1.45	0.22
2000	39	308	1064	329	13.9	109	11.7	1.23	0.36
2001	No data								
2002	5	17	9.5	7	ND	4	ND	0.65	0.40
2003	10	70	94	219	ND	0	ND	3.12	2.32
2004	5	15	66	28	13.9	5	12.2	2.2	0.5
2005	10	30	50	50	ND	24	ND	2.46	0.9
2006	24	48	144	95	ND	10	ND	2.2	0.73

RB = rainbow trout, LMB = largemouth bass

Table 4, Continued. Cold Springs Reservoir Contact Creel Data Summary, 1996-2013.

Year	Days Creel	# Anglers	Total Hours	RB		LMB		Fish/Angler	Fish/Hour
				#	Avg. TL (in)	#	Avg. TL (in)		
2007	3	2	2.5	9	14	0	-	4.5	3.6
2008	No data								
2009	No data								
2010	-	9	17	23	13.1	0	-	2.7	1.41
2011	No contacts made in 2011								
2012	No contacts made in 2012								
2013	-	4	14	4	14.7	2	13	1.5	0.43

RB = rainbow trout, LMB = largemouth bass,

Volunteer creel data forms were completed by 30 anglers, who expended 128.25 hrs to catch 402 fish, of which 300 were rainbow trout, 67 were largemouth bass, and 35 were black crappie. The average reported catch was 13.4 fish/angler with a reported harvest of 3.6 fish/angler. In 2013, 247 rainbow trout were measured and recorded, of those, 179 or 72% were below 12 in (305 mm) TL, 64 or 26% were between 12 and 16 in (305-406 mm) TL, and 4 or 2% were above 16 in (406 mm) TL. Fifty-two largemouth bass were measured and recorded on Cold Springs Reservoir and of those, 15 or 30% were less than 12 in (305 mm) TL and 37 or 71% were greater than 12 in (305 mm) TL. Thirty-five black crappie were measured and recorded on Cold Springs Reservoir and of those, 20 or 57% were less than 10 in (254 mm) TL and 15 or 43% were greater than 10 in (254 mm) TL. Harvest and catch rates calculated from the volunteer creel data are summarized in Table 5.

Table 5. Cold Springs Reservoir Volunteer Creel Survey Data, 1996-2013.

Year	# Fish Caught	# Fish Released	% Fish Released	# Fish Harvested	% Fish Harvested	Fish/Angler		Fish/Hour	
						Catch	Harvest	Catch	Harvest
1996	194	79	41	115	59	9.24	5.48	3.01	1.78
1997	575	258	45	317	55	7.28	4.01	1.55	0.85
1998	798	425	53	373	47	9.27	4.33	1.99	0.93
1999	1,192	781	64	431	36	12.16	4.40	245	0.89
2000	939	468	50	471	50	11.05	5.54	2.01	1.01
2001	No data								
2002	329	223	68	106	32	6.09	4.12	1.6	0.48
2003	858	381	45	477	55	12.4	5.77	3.15	1.4
2004	386	183	47	203	53	10.2	5.3	2.3	1.25
2005	768	425	55	343	45	10.3	5.6	5.4	3.0
2006	801	415	52	386	48	8.75	4.4	2.8	1.44
2007	806	425	53	381	47	9.71	4.6	2.45	1.16
2008	No data								
2009	360	182	51	178	49	17.1	8.48	3.8	1.87

Table 5, Continued. Cold Springs Reservoir Volunteer Creel Survey Data, 1996-2013.

Year	# Fish Caught	# Fish Released	% Fish Released	# Fish Kept	% Fish Kept	Fish/Angler		Fish/Hour	
						Catch	Harvest	Catch	Harvest
2010	220	80	36	140	64	12.2	7.8	2.3	1.47
2011	52	11	21	41	79	7.4	1.6	1.7	0.35
2012	155	110	71	45	29	9.1	2.6	1.9	0.56
2013	402	295	73	107	27	13.4	3.6	3.1	0.83

Cold springs Reservoir was stocked with 63,785 rainbow trout averaging 8.8 in (224 mm) TL during 2013. Table 6 summarizes the rainbow trout stocking since 1996.

Table 6. Cold Springs Reservoir Trout Stocking Summary, 1996-2013.

Year	# Trout	Total Weight (pounds.)	Average TL (in)
1996	39,167	14,384	9.38
1997	30,275	9,188	9.00
1998	26,030	8,398	9.40
1999	29,273	10,910	9.70
2000	28,024	9,069	9.31
2001	28,282	9,390	9.20
2002	29,327	7,795	8.70
2003	31,040	9,935	9.26
2004	31,561	7,477	8.6
2005	26,302	No Data	7.6
2006	24,841	5,654	8.3
2007	14,167	17,645	9.57
2008	32,877	6,615	8.0
2009	12,415	6,825	9.35
2010	38,480	9,362	8.5
2011	38,224	12,000	9.2
2012	38,416	10,825	8.9
2013	63,785	17,450	8.8

### Haymeadow Reservoir

Opportunistic creel surveys were conducted in conjunction with other activities on the Kirch WMA. No anglers were contacted on Haymeadow Reservoir in 2013. Table 7 summarizes contact creel data from 1996 to present.

Table 7. Haymeadow Reservoir Contact Creel Survey Data Summary, 1996-2013.

Year	Days Checked	Number Anglers	Total Hours	RB		LMB		Fish/Angler	Fish/Hour
				# Fish	Avg. Length (in)	# Fish	Avg. Length (in)		
1996	51	888	3,436	1,583	14.7	46	11.79	1.83	0.47
1997	32	477	1,636	639	14.0	78	11.86	1.60	0.44
1998	9	137	607	265	12.3	4	12.12	1.97	0.45
1999	11	156	684	130	12.8	99	12.15	1.47	0.34
2000	36	356	998.5	319	12.7	38	12.65	1.00	0.36
2001	No Data								
2002	13	113	138	222	-	46	ND	3.33	3.75
2003	10	94	62.5	215	-	6	ND	2.35	3.5
2004	4	22	82.5	41	12.1	29	6.5	3.2	0.84
2005	40	60	141	70	11.5	50	11.5	2.0	0.84
2006	24	223	618	327	-	108	-	1.95	0.70
2007	No Data								
2008	No Data								
2009	No Data								
2010	-	17	31.5	90	12.6	49	12.5	8.2	4.41
2011	-	3	9.25	0	-	10	12.6	3.3	1.1
2012	-	2	2.75	12	12.9	0	-	6	4.36
2013	No Data								

RB = rainbow trout, LMB = largemouth bass

Volunteer angler drop-box creel data forms were completed by 31 anglers, who expended 136 hrs to catch 473 fish, of which, 402 were rainbow trout and 71 were largemouth bass. The average reported angler catch rate was 15.3 fish/angler with a reported harvest of 4.1 fish/angler. In 2013, 363 rainbow trout were measured and recorded, of those, 246 or 68% were below 12 in (305 mm) TL, 111 or 31% were between 12 and 16 in (305-406 mm) TL, and six or 2% were above 16 in (406 mm) TL. Sixty-six largemouth bass were measured and recorded on Haymeadow Reservoir and of those, 48 or 73% were less than 12 in (305 mm) TL, 14 or 21% were between 12 and 14 in (305-356 mm) TL, and 4 or 6% were greater than 14 in (356 mm) TL. Harvest and catch rates calculated from the volunteer creel data are summarized in Table 8.

Table 8. Haymeadow Reservoir Volunteer Creel Survey Data, 1996-2013.

Year	# Fish Caught	# Fish Released	% Fish Released	# Fish Kept	% Fish Kept	Fish/Angler		Fish per Hour	
						Catch	Harvest	Catch	Harvest
1996	744	474	64	270	36	10.33	3.75	2.06	0.75
1997	1,915	1,095	57	820	43	9.48	2.66	1.62	0.69
1998	1,639	1,004	61	635	39	9.99	3.87	2.00	0.77
1999	1,289	796	62	493	38	11.41	4.36	2.45	0.94
2000	1,087	677	62	410	38	11.09	4.18	2.20	0.83
2001	1,335	809	61	526	39	10.46	3.76	2.07	0.80
2002	1,877	1,373	73	504	27	16.46	3.54	4.16	0.89
2003	810	595	73	215	27	12.62	5.77	2.75	0.93
2004	434	245	66.2	164	33.8	12.7	4.9	2.9	1.1

Table 8, Continued. Haymeadow Reservoir Volunteer Creel Survey Data, 1996-2013.

Year	# Fish Caught	# Fish Released	% Fish Released	# Fish Kept	% Fish Kept	Fish/Angler		Fish/Hour	
						Catch	Harvest	Catch	Harvest
2005	1,023	870	85	144	15	11.0	3.3	7.0	2.1
2006	1,705	1,120	66	585	34	8.9	5.8	2.8	1.8
2007	699	329	52.9	329	47.06	12.26	5.77	2.8	1.3
2008	No Data								
2009	237	182	77	51	22	19.75	4.25	4.1	0.87
2010	216	147	68	69	32	10.8	3.5	2.4	0.78
2011	113	62	55	51	45	9.4	4.25	1.9	0.83
2012	416	302	73	114	27	11	3	2.7	0.75
2013	473	346	73	127	27	15.3	4.1	3.5	0.93

A total of 66,002 rainbow trout averaging 8.7 in (221 mm) TL were stocked into Haymeadow Reservoir in 2013. Table 9 summarizes trout stocking since 1996.

Table 9. Haymeadow Reservoir Trout Stocking Summary, 1996-2013.

Year	# Trout	Total Weight (pounds)	Average TL (in.)
1996	31,938	10,050	9.25
1997	32,083	9,685	9.00
1998	27,984	8,755	9.50
1999	35,174	13,076	9.75
2000	35,085	11,038	9.25
2001	33,049	9,970	9.00
2002	40,709	11,720	8.90
2003	32,271	9,440	9.02
2004	39,943	29,005	9.0
2005	22,721	4,025	7.6
2006	36,265	8,634	8.4
2007	11,997	3,728	9.15
2008	42,035	8,370	8.0
2009	16,174	9,913	9.2
2010	43,101	11,015	8.6
2011	43,652	13,025	9.1
2012	45,394	12,250	8.8
2013	66,002	17,660	8.7

## Kirch WMA Black Bass Evaluation

### Adams-McGill Reservoir

Electroshocking surveys were not conducted on Adams-McGill Reservoir in 2013 due to electroshocking boat and area biologist availability. Table 10 summarizes population sampling on Adams McGill Reservoir from 1996 to present.

Data on largemouth bass from the creel and hook-and-line surveys was used to calculate relative weight ( $W_r$ ), an index of condition, and Proportional Stock Density (PSD), an index of the percentage of fish of quality size [12 in (305 mm) TL or greater] in a population. When mean  $W_r$  values are well below 100, problems exist in food and feeding relationships. When mean  $W_r$  values are well above 100, fish may not be

making the best use of available food. Largemouth bass sampled in Adams-McGill Reservoir had a mean  $W_r$  value of 90.45, which is higher than last year's index of 83.38 and suggests that fish are in good health and utilize available forage. PSD for 2013 was 44%, which is higher than last year of 35%.

Table 10. Adams-McGill Reservoir Population Sampling Data Summary, 1996-2013.

Year	# Fish			Time (Hours)	Fish/Hour	Avg. Length (in)			Max Length (in)		
	RB	LMB	UK			RB	LMB	UK	RB	LMB	UK
1996	-	-	71	1.5	47.3	-	-	9.5	-	-	13.2
1997	-	-	118	1.5	78.7	-	-	6.9	-	-	12.8
1998	-	-	134	0.5	223.2	-	-	7.7	-	-	12.3
1999	-	-	124	0.7	185.1	-	-	7.8	-	-	14.3
2000	-	-	218	0.7	317.7	-	-	8.8	-	-	12.5
2001	No Survey										
2002	No Survey										
2003	No Survey										
2004	-	-	40	0.5	80.0	-	-	7.5	-	-	13.1
2005	No Survey										
2006	No Survey										
2007	-	-	107	0.4	243.2	-	-	8.0	-	-	19.0
2008	No Survey										
2009	No Survey										
2010	28	13	-	0.9	44.6	14.4	11.3	-	18.1	13.0	-
2011	3	28	-	1.2	28.4	9.7	9.1	-	12.0	14.0	-
2012	No Survey										
2013	61	0	-	18.5	3.3	0	11.6	-	0	14.5	-

RB = rainbow trout, LMB = largemouth bass, UK = unknown, species not noted

### Cold Springs Reservoir

Electroshocking surveys were conducted in May with the aid of area personnel for 0.47 hrs of shocking time and a Catch-Per-Unit-Effort (CPUE) of 89 fish/hour. Rainbow trout did not show up in the electroshocking survey in 2013. Largemouth bass averaged 10.8 in (274 mm) TL, which is near the same from the 2012 average of 10.7 in (272 mm) TL. Table 11 summarizes population sampling on Cold Springs Reservoir from 1996 to present.

Data on largemouth bass from creel and population surveys was used to calculate  $W_r$  and PSD. Largemouth bass sampled in Cold Spring Reservoir had a mean  $W_r$  value of 93.86, which is the same as last year and indicates excellent health. The PSD value for 2013 was 33%, which was up from last year's 22%.

Table 11. Cold Springs Electroshocking Survey Summaries, 1996-2013.

Year	Number				Sampling (hours)	Fish/hour	Average Total Length (in)				Max Total Length (in)			
	LMB	RB	BB	BC			LMB	RB	BB	BC	LMB	RB	BB	BC
1996	No Survey													
1997	37	41	0	0	1.50	52.0	5.4	12.6	-	-	11.6	16.3	-	-
1998	65	25	0	0	0.53	170.5	8.4	12.4	-	-	13.5	8.0	-	-
1999	47	139	0	0	0.69	269.6	9.3	13.3			12.3	16.0		
2000	60	40	7	0	0.61	185.3	9.2	11.7	11.5	-	13.0	16.0	13.8	-
2001	No Survey													
2002	No Survey													
2003	46	13	12	0	0.48	145.7	8.9	9.0	11.3	-	13.4	14.4	15.0	-
2004	34	3	10	0	0.30	141.0	5.2	13.4	11.3	-	14.5	17.6	13.0	-
2005	No Survey													
2006	No Survey													
2007	62	21	1	0	0.4	210	12.5	11.6	-	-	15.0	20.0	-	-
2008	No Survey													
2009	No Survey													
2010	5	17	2	5	0.6	48.3	13.9	11.4	13.3	8.0	16.2	15.5	13.5	8.2
2011	13	3	2	4	0.98	22.4	12.1	12.0	12.5	9.0	19.0	14.0	13.0	10.0
2012	20	19	2	1	0.62	68	10.3	10.8	11.4	8.0	12.4	14.5	12.0	8.0
2013	30	0	8	4	0.47	89	10.8	-	12.4	7.1	13.5	-	14.0	7.5

LMB = largemouth bass, RB = rainbow trout, BB = black bullhead, BC=black crappie.

\*2004 survey was in the fall and should NOT be compared to the spring data.

### Haymeadow Reservoir

Electroshocking surveys were conducted in May with the aid of area personnel for 0.73 hrs of shocking time and a CPUE of 34 fish/hour. Only two rainbow trout were caught during the survey and averaged 12 in (305 mm) TL, which is close to previous annual averages and represents a good overwintering growth compared to the average 2012 stocking size of 8.8 in (224 mm) TL. Largemouth bass averaged 11.7 in (297 mm) TL, which is up from the 2012 average of 9.8 in (249 mm) TL. Table 12 summarizes population sampling on Haymeadow Reservoir from 1996 to 2013.

Data on largemouth bass from the creel and population surveys was used to calculate  $W_r$  and PSD. Largemouth bass sampled in Haymeadow Reservoir had a mean  $W_r$  value of 96.95, which is higher than last year of 94.4 and indicates excellent health. The PSD value for 2013 was 47%, which is much higher than last year's 27%.

Table 12. Haymeadow Reservoir Population Sampling Data Summary, 1996-2013.

Year	#				Sampling time (hours)	Fish/Hr	Avg. Total Length (in)				Max Total Length (in)			
	LMB	RB	BB	BC			LMB	RB	BB	BC	LMB	RB	BB	BC
1996	20	85	1	0	1.00	106.0	10.3	10.9	10.0	-	11.8	19.5	10.0	-
1997	44	23	6	0	0.91	80.21	10.0	13.0	9.7	-	13.5	17.8	12.1	-
1998	288	43	13	0	0.53	264.39	10.5	13.1	11.0	-	18.0	16.0	12.0	-
1999	63	10	38	0	0.40	280.44	13.8	11.0	11.0	-	14.6	16.0	13.1	-
2000	51	33	62	0	0.82	119.19	11.1	11.1	11.8	-	15.5	19.5	13.4	-
2001	No Survey													
2002	No Survey													

Table 12, Continued. Haymeadow Reservoir Population Sampling Data Summary, 1996-2013.

Year	#				Sampling time (hours)	Fish/Hr	Avg. Total Length (in)				Max Total Length (in)			
	LMB	RB	BB	BC			LMB	RB	BB	BC	LMB	RB	BB	BC
2003	3	45	3	0	1.0	51	14.4	10.2	12.0	-	30.8	11.2	13.5	-
2004	15	0	17	0	0.30	96	6.8	-	10.8	-	14.7	-	12.8	-
2005	No Survey													
2006	No Survey													
2007	112	20	2	0	0.526	254	10.9	14.0	11.1	-	16.0	17.0	11.5	-
2008	No Survey													
2009	No Survey													
2010*	7	34	9	0	1.83 net nights	27.3 F/NN	10.9	11.4	13.2	-	15.1	15.2	14.4	-
2011	No Survey													
2012	42	10	5	2	0.6	98	9.3	12.8	12.0	6.0	21.5	18.0	13.0	7.0
2013	19	2	2	1	0.73	34	11.7	12.0	11.3	8.5	19.0	12.5	12.5	8.5

LMB = largemouth bass, RB = rainbow trout, BB = black bullhead, BC=black crappie

NOTE: 2004 survey was in the fall and should NOT be compared to the spring data from other years

\*2010 was a gill net survey. A net night =12 hrs.

### Dacey Reservoir Trophy Fishery Evaluation

Opportunistic creel surveys were conducted in conjunction with other activities on the Kirch WMA. A total of two anglers were contacted, fishing for a total of 11 hrs. These anglers caught 14 largemouth bass and two rainbow trout. The average reported angler catch at Dacey Reservoir in 2013 was 1.5 fish/hour and 8 fish/angler. Table 13 summarizes contact creel data from 1996 to present.

Table 13. Dacey Reservoir Creel Survey Data Summary, 1996-2013.

Year	Catch Rates		Avg. TL (in)			Comments
	Fish/Angler	Fish/Hour	LMB	RB	UK	
1996	0.84	0.43	-	-	13.3	First creel since 1990
1997	6.25	0.84	-	-	11.8	Bass tournament
1998	3.50	0.50	-	-	12.0	Bass tournament
1999	2.83	0.35	-	-	12.4	Bass tournament
2000	1.54	0.28	-	-	12.5	Bass tournament
2001	No contact creel documented					
2002	No contact creel documented					
2003	No contact creel documented					
2004	No contact creel documented					
2005	5 anglers had 2 trout of 18 inches total length					
2006	No contact creel documented					
2007	No contacts were documented; Drop- box installed late fall					
2008	No data					
2009	No data					
2010	3	4.6	12.1	-	-	No trout in the creel
2011	2.4	1.5	13.0	15.5	-	Only 4 bass in the creel
2012	3.2	1.5	10.6	17.3	-	Only 5 bass in the creel
2013	8	1.5	13.1	15.5	-	Only 2 anglers contacted

LMB = largemouth bass, RB = rainbow trout, UK = unknown, species not noted

Volunteer angler drop-box creel data forms were completed by 18 anglers, who expended 96 hrs to catch 127 fish, of which 101 were rainbow trout and 26 were largemouth bass. The average reported angler catch rate was 7.1 fish/angler with a reported harvest of 1.3 fish/angler. In 2013, 101 rainbow trout were caught and measured, of those, four or 4% were below 12 in (305 mm) TL, 41 or 41% were between 12 and 16 in (305-406 mm) TL, and 56 or 55% were above 16 in (406 mm) TL. Twenty-four largemouth bass were caught and measured on Dacey Reservoir, of those, 8 or 33% were less than 12 in (305 mm) TL, 9 or 38% were between 12 and 14 in (305-356 mm) TL, and 7 or 30% were greater than 14 in (356 mm) TL. Harvest and catch rates calculated from the volunteer creel data are summarized in Table 14.

Table 14. Dacey Reservoir Volunteer Creel Survey Data (all species)

Year	# Fish Caught	# Fish Released	% Fish Released	# Fish Kept	% Fish Kept	Fish/Angler		Fish/Hour	
						Catch	Harvest	Catch	Harvest
2012	257	195	76	62	24	8.9	2.1	2.1	0.51
2013	127	103	81	24	19	7.1	1.3	1.3	0.25

Electroshocking surveys were not conducted on Dacey Reservoir in 2013 due to electroshocking boat and area biologist availability. Dacey Reservoir is managed as a trophy rainbow trout fishery that requires anglers to release their catch. Therefore it makes conducting creel surveys difficult as anglers almost immediately release their catch.. Hook-and-line surveys targeting rainbow trout were used throughout the year to compensate for the lack of rainbow trout in the creel. Twenty-nine rainbow trout were caught in 22.25 hrs for a catch rate of 1.3 fish/hour. The rainbow trout averaged 17.7 in (450 mm) TL, which represents an excellent size for a trophy fishery. Trophy harvest regulations for Dacey Reservoir were developed in 2009 and put into effect in March 2010. Table 15 summarizes population sampling on Dacey Reservoir.

Data on largemouth bass from the creel and population surveys was used to calculate  $W_r$  and PSD. Largemouth bass sampled in Dacey Reservoir had a mean  $W_r$  value of 90.36, which is down from last year's 94.57, but still indicates excellent health. The PSD value for 2013 was 93%, which is significantly higher than last year's of 37%.

Table 15. Dacey Reservoir Population Sampling Data Summary, 2010-2013.

Year	#		Sampling Hours	Fish/Hour	Avg. Total Length (in)		Max Total Length (in)	
	RB	LMB			RB	LMB	RB	LMB
2010	13	11	0.9	26.7	17.5	12.0	19.0	14.0
2011	12	38	1.5	33.3	14.0	12.0	21.0	15.4
2012	4	31	0.95	37	15.0	11.2	18.0	15.0
2013*	29	13	28.25	1.5	17.7	12.8	21.0	15.0

\*2013 was hook and line surveys

In 2013, 10,675 rainbow trout averaging 7.3 in (185 mm) TL were stocked into Dacey Reservoir. Table 7 summarizes trout stocking on Dacey Reservoir since 2004.

Table 16. Dacey Reservoir Trout Stocking Summary 2004 -2013

Year	# Trout	Total Weight (pounds)	Average TL (in.)
2004	3,002	435	7.0
2005	No Trout Stocking		
2006	10,135	2,100	8.1
2007	2,040	600	9
2008	8,815	1,550	7.0
2009	4601	2,000	10.3
2010	5,320	1,400	8.7
2011	5,280	1,200	8.3
2012	5,100	1,500	8.7
2013	10,675	1,750	7.3

### MANAGEMENT REVIEW

The sport fishery at Kirch WMA seems to be doing well. Overall health of largemouth bass seems to be excellent and the overall size of largemouth bass being caught is up from last year. The PSD is in the 40% range for all the reservoirs. A regulation change for the management area will be explored in 2014 to try and increase that percentage. A concerted effort to contact more anglers to increase sample size in the creel will be done in 2014. Black crappie have been introduced illegally to the Kirch WMA. It is not know when this occurred but they are showing up in population and creel surveys on Adam's McGill, Cold Springs, and Haymeadow reservoirs. Black crappie appear to be increasing in numbers, particularly in Cold Springs Reservoir and anglers are excited for this new opportunity. Surveys focusing on black crappie will be done in 2014 to assess population and size structure. The average size of rainbow trout stocked into all reservoirs was about the same in 2013 compared to 2012. A larger average size of fish is recommended for stocking in spring when fishing pressure is increasing. It is not as important for fall stocking since fish are able to grow throughout the winter. Dacey Reservoir is now being managed as a trophy fishery; therefore, average fish size being stocked is more desirable at 9 in (229 mm) TL or larger.

### RECOMMENDATIONS

- Conduct a general fisheries assessment through opportunistic angler contacts at all four Kirch WMA reservoirs.
- Maintain volunteer angler drop-boxes at Dacey, Adams-McGill, Haymeadow, and Cold Springs reservoirs.
- Coordinate water management and reservoir management needs with the Kirch WMA manager and update the fisheries management sections of the Kirch WMA CMP in cooperation with the Kirch WMA manager as required.
- Continue implementation of bird predation control through management of unoccupied habitat and adjustments to rainbow trout stocking strategies.

- Provide sport fishery information to anglers directly and through NDOW channels.
- Implement strategies for early detection and long-term monitoring for quagga mussels and other invasive species.
- Implement strategies to prevent introduction and prevent spread of quagga mussels through signage, information delivery, and angler/boater contacts.
- Complete an in-depth evaluation of the black bass fishery in Kirch WMA reservoirs to evaluate the efficacy of and need for existing restricted harvest regulations and to provide better information on the current status and condition of the fishery to help identify and develop reservoir management strategies.
- Evaluate black bass catch and harvest data from volunteer angler drop-box responses at Dacey, Adams-McGill, Haymeadow, and Cold Springs reservoirs.
- Complete a spring electroshocking survey at Adams-McGill Reservoir to assess trout overwintering growth and survival and warm-water community structure and recruitment.
- Complete a spring electroshocking or hoop/gill netting survey at Haymeadow and Cold Springs reservoirs to assess trout overwintering growth and survival and warm-water community structure and recruitment.
- Evaluate existing and historical data on black bass population in the reservoirs and identify possible changes in bass harvest regulations that would benefit the fishery.
- Evaluate the trophy rainbow trout regulation for Dacey Reservoir.
- Identify current conditions in Dacey Reservoir using electroshocking surveys.
- Stock up to 5,000 9 in (229 mm) TL or longer rainbow trout in Dacey Reservoir in late fall.
- Conduct an electroshocking survey in Dacey Reservoir annually in the spring to evaluate age structure and species composition of the sport fishery.
- Collect angler success and satisfaction data at Dacey Reservoir through direct contact creel surveys semi-monthly and maintain a volunteer, angler drop-box to provide supplemental angler use information.

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