NEVADA DEPARTMENT OF WILDLIFE
STATEWIDE SPORT FISHERIES MANAGEMENT

FEDERAL AID JOB PROGRESS REPORTS

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EASTERN REGION RAINBOW TROUT STRAIN EVALUATION STUDY EASTERN REGION

NEVADA DEPARTMENT OF WILDLIFE, FISHERIES DIVISION
ANNUAL JOB PROGRESS REPORT

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NEVADA DEPARTMENT OF WILDLIFE, FISHERIES DIVISION
ANNUAL JOB PROGRESS REPORT

State: *Nevada*
Project Title: *Statewide Fisheries Program*
Job Title: *Eastern Region Rainbow Trout Strain Evaluation Study*
Period Covered: *January 1, 2012 through December 31, 2012*

SUMMARY

Selected Northeastern Nevada Reservoirs (Illipah, South Fork, Wildhorse, and Wilson Sink reservoirs) were surveyed during 2012 to document return of marked fish from the initial stocking of 26,673 Eagle Lake strain and 28,976 Bel-Air strain rainbow trout that were released in spring 2011. Evaluation of both strains of marked rainbow trout was performed on area reservoirs during 2012, including but not limited to, opportunistic angler contacts (creel survey), electrofishing, and gill net surveys to contact as many marked trout as possible.

Marked fish returns for 2012 were somewhat limited, but recovery of both strains was documented at all reservoirs with the exception of Wildhorse, which produced no marked fish from creel or population surveys. To date, South Fork Reservoir has 11 marked Bel-Air rainbow trout returns (5 in 2011, 6 in 2012), and 13 marked Eagle Lake rainbow trout returns (5 in 2011, 8 in 2012); Wilson Sink Reservoir has 16 marked Bel-Air rainbow trout returns (5 in 2011, 11 in 2012), and 13 marked Eagle Lake rainbow trout returns (7 in 2011, 6 in 2012). Illipah Reservoir reported the return of 13 marked Eagle Lake rainbow trout in early 2012.

Despite the limited returns and the small sample size for comparing sport fish attributes of each strain, the characteristics of each reservoir (volume and type, productivity, catch rates and fish lengths) are beginning to influence each strain. During 2012, South Fork Reservoir returned 6 marked Bel-Air rainbow trout that had an average size of 17.0 in (TL) (range 16.1 – 17.9 in) and an average growth of 84% since time of stocking. South Fork Reservoir also returned 8 marked Eagle Lake rainbow trout that had an average length of 17.3 in (TL) (range 14.4 – 19.8 in) with an average growth of 90%. Wilson Sink Reservoir returned 11 marked Bel-Air rainbow trout that had average length of 13.4 in (TL) (range 11.6 – 15.2 in, TL) with an average growth of 32%. Wilson Sink Reservoir also returned 6 Eagle Lake marked rainbow trout that had average length of 14.4 inches (TL) (range 12.4 – 16.5 in) with an average growth increase of 51%. Illipah Reservoir returned 13 marked Eagle Lake rainbow trout that had average length of 13.4 in (TL) (range 12.0 – 15.1 in) with an average growth of 35%.

BACKGROUND

The Nevada Department of Wildlife depends on hatchery-reared trout to maintain and enhance recreational fishing opportunities, as many times natural recruitment of trout is negligible and unable to sustain desired catch rates, desired sizes, and return to anglers. Approximately 160,000 catchable size (>8.0 in, FL) rainbow trout are planted each spring in the Eastern Region (Elko, Eureka, Lander, and White Pine Counties) to provide recreational angling for cold water fish species under various fisheries management goals and objectives.

NDOW's historical uses of particular strains of rainbow trout have recently become unavailable. Recent renovations and refurbishments of the State's hatchery system in 2006 has reduced the ability to maintain desired and proven strains of rainbow trout brood stock necessary for egg production to meet regional trout request and fisheries objectives. Removal of brood stock and loss of proven and successful strains of spring-spawned rainbow trout has left the Department dependent on outside sources (Federal, State, and private hatcheries) to provide and produce annual egg request to meet management objectives. New and unproven strains are now being utilized to replace previous strains of spring rainbow trout.

OBJECTIVES and APPROACHES

Objective: Evaluate the effects of the new spring strain of rainbow trout (Bel-Air strain) and compare sport fish attributes with existing (Eagle Lake strain) and previous strain (Tasmanian) through marked fish returns in Illipah Reservoir, South Fork Reservoir, Wildhorse Reservoir, and Wilson Sink reservoir.

Approaches:

- Set experimental gill nets for 2 net-nights in spring in Illipah Reservoir.
- Set experimental gill nets for 4 net-nights in spring in South Fork Reservoir (see South Fork Reservoir Fishery Study).
- Set experimental gill nets for 3 net-nights in spring in Wildhorse Reservoir (see Wildhorse Reservoir Fishery Study).
- Electroshock 2 established transects 1 night in late summer on Wilson Sink Reservoir (see Wilson Sink Reservoir Largemouth Bass Study) and set experimental gill nets for 2 net-nights in spring.
- Collect marked fish returns through opportunistic angler contacts on all four waters.
- Build a database and begin to analyze waters and trout strains.

PROCEDURES

Eagle Lake and Bel-Air strains of rainbow trout were graded by size at Spring Creek Rearing Station and Gallagher Hatchery. Subsequent to grading, fish were anesthetized, given an adipose or pectoral fin clip with scissors, counted and returned

to hatchery raceways. Bel-Air and Eagle Lake strain rainbow trout were marked at Gallagher Hatchery on October 13 and November 2, 2010. Subsequent to grading, 7,700 Eagle Lake strain rainbow trout were given a right pectoral fin clip in October 2010 at Spring Creek Rearing Station. These fish were stocked at Illipah Reservoir on April 26 and April 27, 2011 at an average size of 9.9 in. Trout were measured fork length in the hatchery and total length in the field.

A total of 30,569 Bel-Air strain rainbow trout were adipose fin clipped on October 13, 2010 at Gallagher Hatchery. of the surviving 28,976 clipped Bel-Air strain rainbow trout (94.6% of total fish clipped) were stocked equally at Wilson, Wildhorse, and South Fork reservoirs in April, May, and late June at an average size of 9.2 in .

A total of 19,506 Eagle Lake strain rainbow trout were left pectoral fin clipped on November 3, 2010 at Gallagher Hatchery. The surviving 18,973 clipped Eagle Lake strain rainbow trout (97.3% of total fish clipped) were stocked equally at Wilson and South Fork reservoirs in April and late June at an average size of 9.1 in.

FINDINGS

Wilson Sink Reservoir returned 11 marked Bel-Air strain that had an average length of 13.4 in (range 11.6 – 15.2 in), with an average growth of 32% since time of stocking. There was also returned 6 Eagle Lake strain that had an average length of 14.4 in (range 12.4 – 16.5 in), with an average growth of 51% since time of stocking.

Although the 2012 Wilson Sink Reservoir sample size was relatively small (17 fish), Eagle Lake strain exhibited substantial growth of almost 2 in (Avg. 5.57 in per year versus 3.69 in for Bel-Air strain) since time of stocking. Figures 1 and 2 illustrate the growth of the two strains in the second year of the on-going 3-year study. The majority of tagged fish were sampled during 2012 electrofishing and gill net surveys on May 16 (Table 1).

South Fork Reservoir returned 6 Bel-Air strain that had an average size of 17.0 in (range 16.1 – 17.9 in) and an average growth of 84% since time of stocking. South Fork Reservoir also returned 8 Eagle Lake strain that had an average length of 17.3 in (range 14.4 – 19.8 in) with an average growth of 90% since time of stocking. Figures 3 and 4 illustrate this strain comparison, with larger fish being caught at South Fork compared to other test reservoirs.

Both strains of rainbow trout performed well in South Fork Reservoir showing similar yearly growth, but captured Eagle Lake strain had an average residency of 405 days (1.11 years) since initial stocking compared to 486 days (1.33 years) for the Bel-Air strain rainbow trout. Extrapolating out the average growth rate exhibited in 2012 by the Eagle Lake strain equates to approximately 7.1 in per year, compared to only 5.6 in for the Bel-Air strain (Table 2).

Figure 1. Eagle Lake Strain Rainbow Trout – Wilson Sink Reservoir

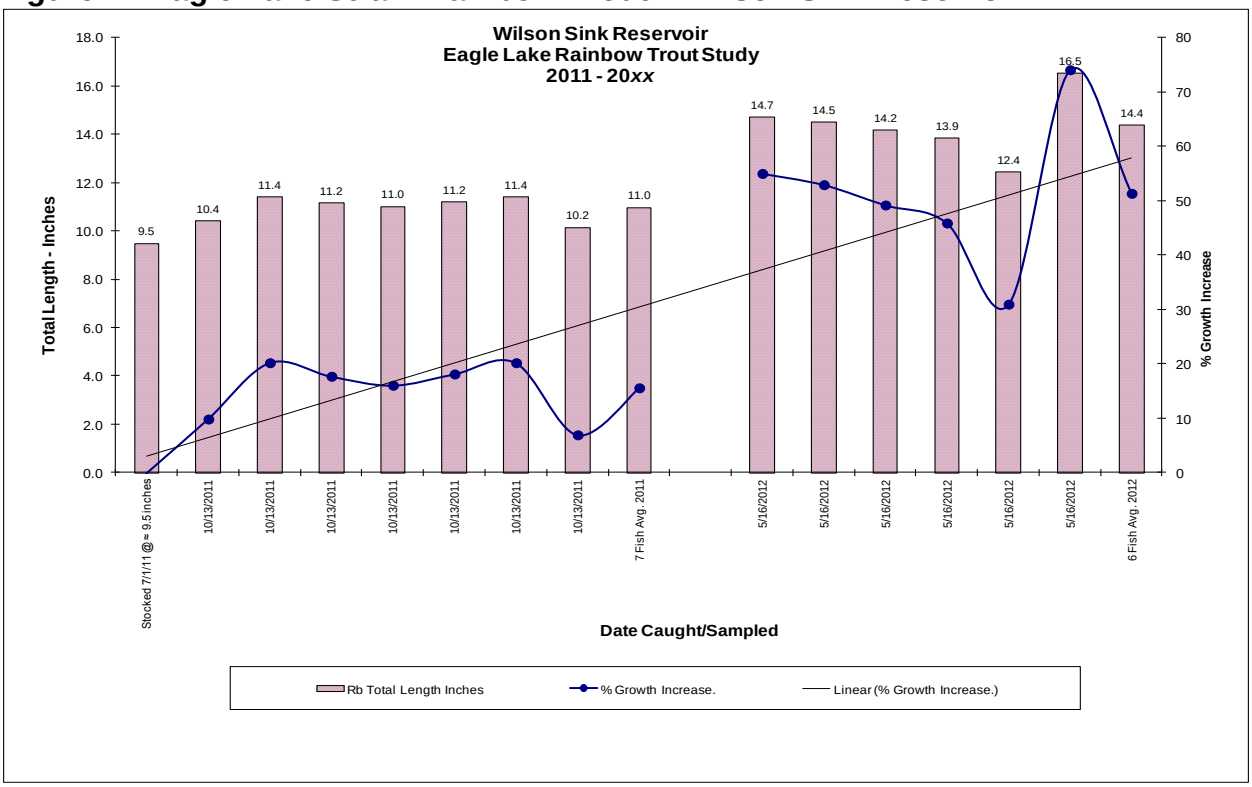


Figure 2: Bel-Air Strain Rainbow Trout – Wilson Sink Reservoir

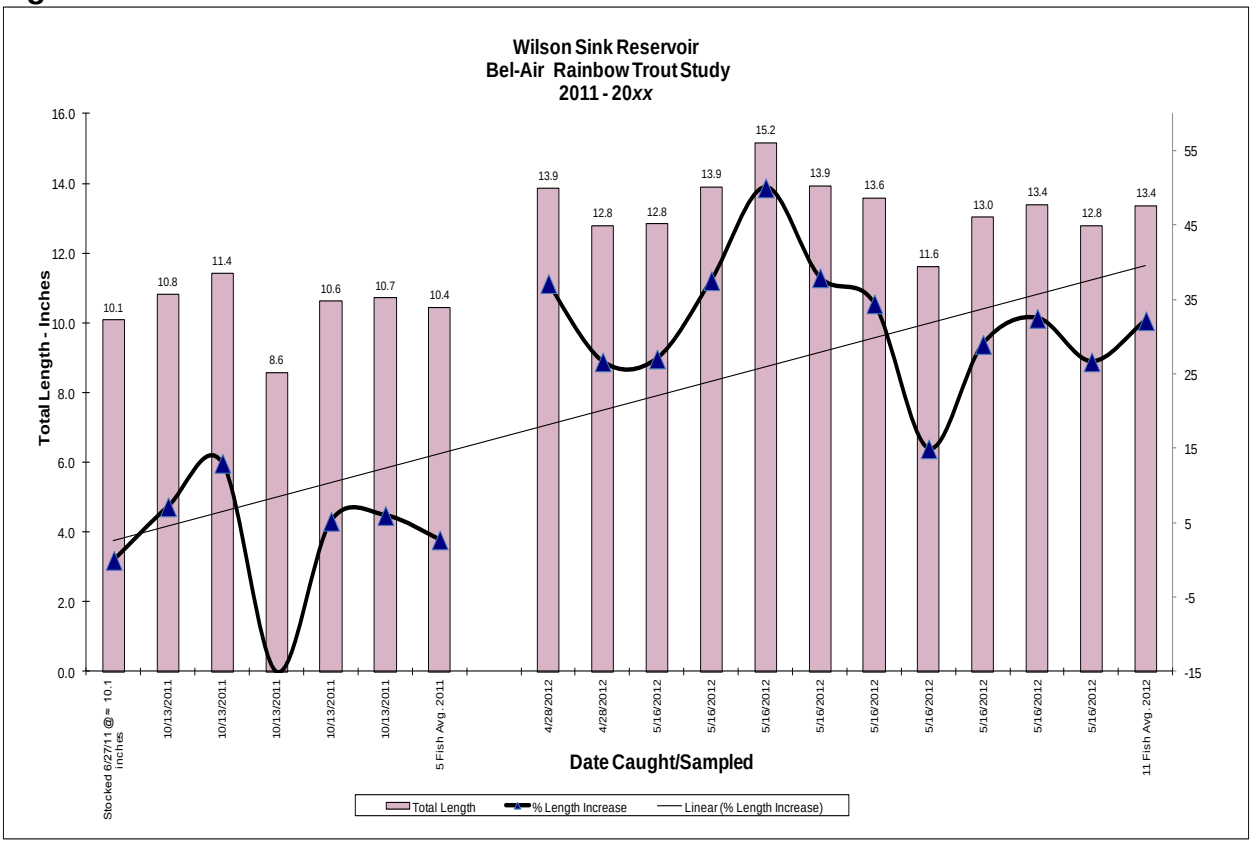


Figure 3. Eagle Lake Strain Rainbow Trout – South Fork Reservoir

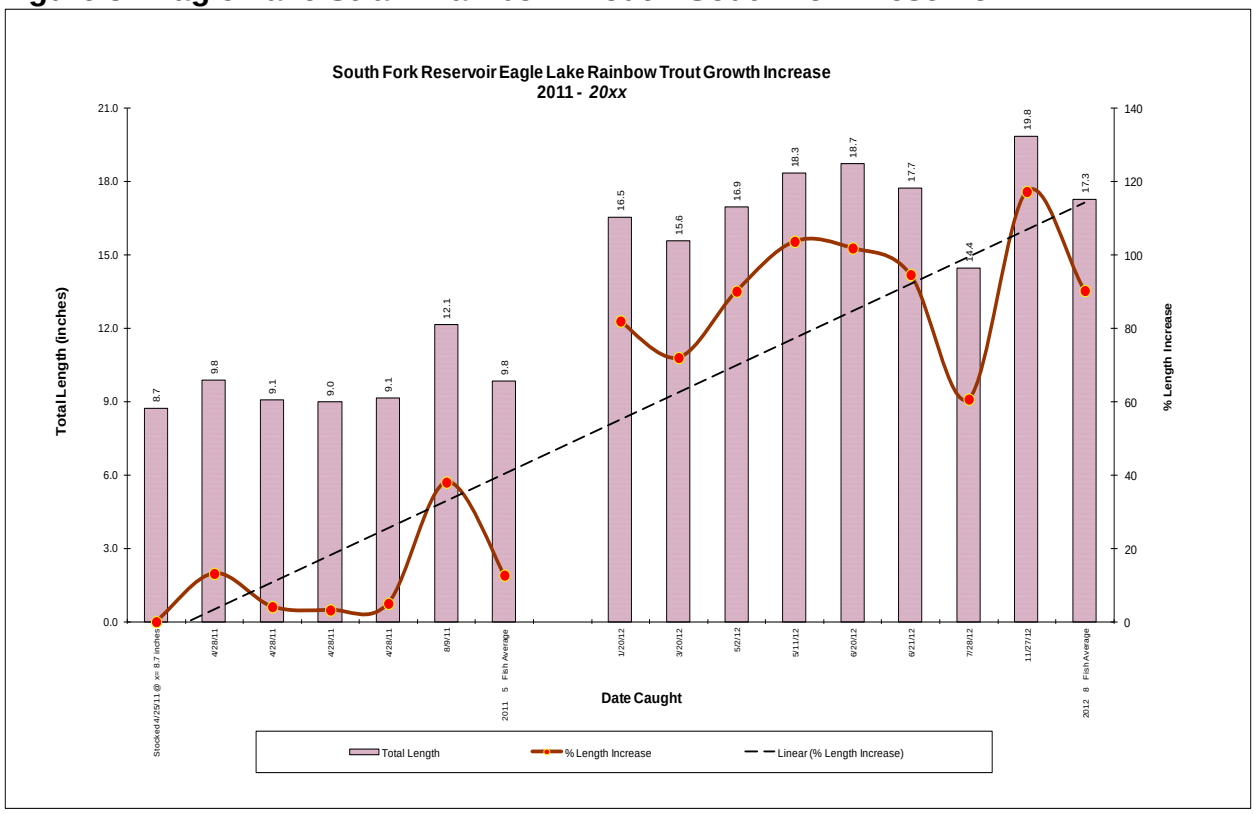
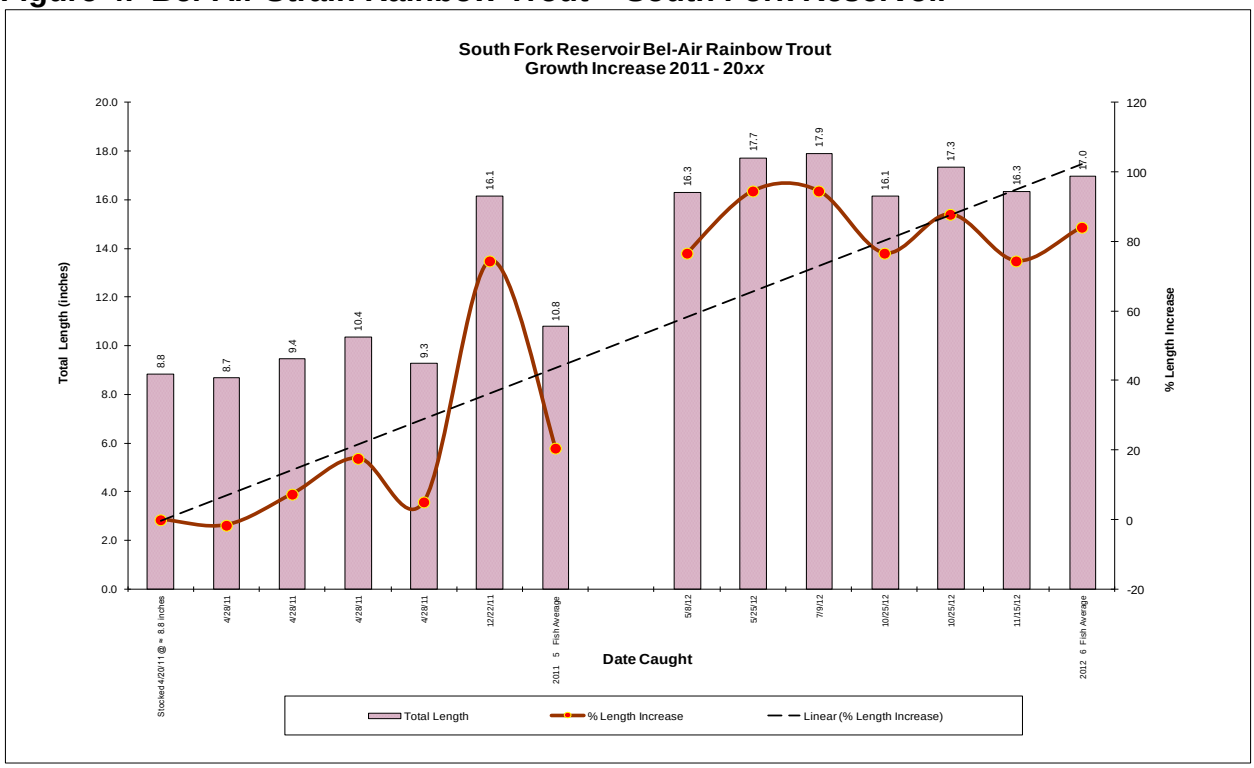


Figure 4. Bel-Air Strain Rainbow Trout – South Fork Reservoir



Illipah Reservoir returned 13 marked Eagle Lake strain through May 2012 that had an average length of 13.4 in (range 12.0 – 15.1 in) and average growth of 35%, or 3.5 in since initial stocking. A position vacancy for that reservoir limited data collection during the summer of 2012.

MANAGEMENT REVIEW

All approaches for the Eastern Region Rainbow Trout Strain Evaluation Study except the gill netting survey of Illipah Reservoir were completed in 2012. The Illipah survey will be completed in the spring of 2013.

No marked fish returns from Wildhorse Reservoir in 2012 was a concern, since 167 rainbow trout were contacted during creel and population surveys. The marked Bel-Air strain should be of desired size in 2013 for anglers to harvest, so expectations are for more returns in the 2013 surveys.

RECOMMENDATIONS

- Continue the electroshocking and gill netting surveys for Illipah, South Fork, Wildhorse and Wilson Sink reservoirs in 2013 to collect marked fish in association with other fishery objectives.

- To collect marked fish returns through opportunistic angler contacts on all four waters associated with the Eastern Region Rainbow Trout Strain Evaluation Study and maintain a Regional Fisheries database for further analysis.

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Date: February 2013

Table 1

Wilson Sink Reservoir 2011 -- 20*xx* Creel & Population Survey Sample Lengths & Weights -- Bel-Air Rainbow Trout with Adipose fin clip

Fish Number	Creel/Sample Date	Fork Length(mm)	Total Length(mm)	Weight (g)	Fork Length (In.)	Total Length(In.)	Weight (ounces)	Date Planted	Avg. Size @ Stocking	Days in Lake	Growth Increase(inches)	%Length Increase
Control Fish	Stocked 6/27/11 @ ≈ 10.1 inches	**256**	**256**	**190**	**10.1**	**10.1**	**6.7**	**June 27, 2011**	**10.1**			0
2011 Electrofish Survey Capture 1	10/13/2011		275			10.8	0.0	June 27, 2011	10.1	108	0.73	7.2
2	10/13/2011		290			11.4	0.0	June 27, 2011	10.1	108	1.32	13.0
3	10/13/2011		218			8.6	0.0	June 27, 2011	10.1	108	-1.52	-15.0
4	10/13/2011		270			10.6	0.0	June 27, 2011	10.1	108	0.53	5.2
5	10/13/2011		272			10.7	0.0	June 27, 2011	10.1	108	0.61	6.0
Total Fish Return 2011	**5 Fish Avg. 2011**		**265**			**10.4**				**108**	**0.33**	**2.7**
										2011 x = 0.29 yrs	***2011 x = 1.14 inch / yr (Extrapolated/Projected)***	
6	4/28/2012	340	352		13.4	13.9		June 27, 2011	10.1	306	3.8	37.2
7	4/28/2012	310	325		12.2	12.8		June 27, 2011	10.1	306	2.7	26.7
8	5/16/2012		326	445		12.8	15.7	June 27, 2011	10.1	324	2.7	27.1
9 **Gill Net** / Electro Survey	5/16/2012		353	510		13.9	18.0	June 27, 2011	10.1	324	3.8	37.6
10 **Gill Net** / Electro Survey	5/16/2012		385	745		15.2	26.3	June 27, 2011	10.1	324	5.1	50.1
11 **Gill Net** / Electro Survey	5/16/2012		354	505		13.9	17.8	June 27, 2011	10.1	324	3.8	38.0
12 **Gill Net** / Electro Survey	5/16/2012		345	405		13.6	14.3	June 27, 2011	10.1	324	3.5	34.5
13 **Gill Net** / Electro Survey	5/16/2012		295	285		11.6	10.0	June 27, 2011	10.1	324	1.5	15.0
14 **Gill Net** / Electro Survey	5/16/2012		331	430		13.0	15.2	June 27, 2011	10.1	324	2.9	29.0
15 Gill Net / **Electro** Survey	5/16/2012		340	465		13.4	16.4	June 27, 2011	10.1	324	3.3	32.5
16 Gill Net / **Electro** Survey	5/16/2012		325	430		12.8	15.2	June 27, 2011	10.1	324	2.7	26.7
Total Fish Return 2012	**11 Fish Avg. 2012**		**339**	**469**		**13.4**	**16.5**			**321**	**3.25**	**32.2**
										2012 x = 0.88 yrs	***2012 x =0. 69 inch / yr (Extrapolated/Projected)***	
	16-Fish AVG. to date 2011 -- 20xx AVG.		***302.1***	***468.9***		***11.9***	***16.5***	***June 27, 2011***	***10.1***	***214.4***	***1.79***	***17.8***
										Avg x = 0.59 yrs	***x =3.05 inch / yr (Extrapolated/Projected)***	

Total clipped fish stocked in 2011 = 9,240

Wilson Sink Reservoir 2011 -- Creel & Population Survey Sample Lengths & Weights -- Eagle Lake Strain Rainbow Trout with Left Pectoral fin clip

Fish Number	Creel/Sample Date	Fork Length(mm)	Total Length(mm)	Weight (g)	Fork Length (In.)	Total Length(In.)	Weight (ounces)	Date Planted	Avg. Size @ Stocking	Days in Lake	Growth Increase(inches)	%Length Increase
Control Fish	**Stocked 7/1/11 @ ≈ 9.5 inches**	**241**	**241**	**157**	**9.5**	**9.5**	**5.5**	**July 1, 2011**	**9.5**	**0**	0.0	0
2011 Electrofish Survey Capture 1	10/13/2011		265			10.4		July 1, 2011	9.5	104	0.9	9.8
2	10/13/2011		290			11.4		July 1, 2011	9.5	104	1.9	20.2
3	10/13/2011		284			11.2		July 1, 2011	9.5	104	1.7	17.7
4	10/13/2011		280			11.0		July 1, 2011	9.5	104	1.5	16.0
5	10/13/2011		285			11.2		July 1, 2011	9.5	104	1.7	18.1
6	10/13/2011		290			11.4		July 1, 2011	9.5	104	1.9	20.2
7	10/13/2011		258			10.2		July 1, 2011	9.5	104	0.7	6.9
Total Fish Return 2011	**7 Fish Avg. 2011**		**279**			**11.0**				**104**	**1.5**	**15.6**
										2011 x = 0.29 yrs	***2011 x = 5.17 inch / yr (Extrapolated/Projected)***	
Gill Net /Electro Survey 8	5/16/2012		374	560		14.7	19.7	July 1, 2011	9.5	320	5.2	55.0
Gill Net /Electro Survey 9	5/16/2012		369	505		14.5	17.8	July 1, 2011	9.5	320	5.0	52.9
Gill Net /Electro Survey 10	5/16/2012		360	550		14.2	19.4	July 1, 2011	9.5	320	4.7	49.2
Gill Net /Electro Survey 11	5/16/2012		352	460		13.9	16.2	July 1, 2011	9.5	320	4.4	45.9
Gill Net /**Electro** Survey 12	5/16/2012		316	310		12.4	10.9	July 1, 2011	9.5	320	2.9	31.0
Gill Net /**Electro** Survey 13	5/16/2012		420	605		16.5	21.3	July 1, 2011	9.5	320	7.0	74.1
Total Fish Return 2012	**6 Fish Avg. 2012**		**365**	**498**		**14.4**	**17.6**			**320**	**4.9**	**51.3**
										2012 x = 0.88 yrs	***2012 x = 5.57 inch / yr (Extrapolated/Projected)***	
	13-Fish AVG. to date 2011 – 20xx AVG.		***322.0***	***498.3***		***12.7***	***17.6***	***July 1, 2011***	**9.5**	***212.0***	***3.2***	***33.4***
										Avg x = 0.58 yrs	***x = 5.52 inch / yr (Extrapolated/Projected)***	

Total clipped fish stocked in 2011 = 9,065

Table 2

South Fork Reservoir 2011 -- 20*xx* Creel & Population Survey Lengths & Weights -- Bel-Air Rainbow Trout with Adipose fin clip

Fish Number	Creel/Sample Date	Fork Length(mm)	Total Length(mm)	Weight (g)	Fork Length (In.)	Total Length(In.)	Weight (ounces)	Date Planted	Avg. Size @ Stocking	Resident Days in Lake	Growth Increase (inches) / Year	Growth Increase (mm)	%Length Increase
Control Fish	**Stocked 4/20/11 @ ≈ 8.8 inches**	**224**	**224**	**126**	8.8	8.8	4.4	**April 20, 2011**	**8.8**	**0**	0.0	0.0	0.0
Gill Net 1	4/28/11	220	220		8.7	8.7		April 20, 2011	8.8	8	-0.1	-3.5	-1.6
Gill Net 2	4/28/11	240	240		9.4	9.4		April 20, 2011	8.8	8	0.6	16.5	7.4
Gill Net 3	4/28/11	263	263		10.4	10.4		April 20, 2011	8.8	8	1.6	39.5	17.7
Gill Net 4	4/28/11	235	235		9.3	9.3		April 20, 2011	8.8	8	0.5	11.5	5.1
?? 5	12/22/11	390	410		15.4	16.1		April 20, 2011	8.8	246	6.6	166.5	74.5
	2011 5 Fish Average	**270**	**274**		**10.6**	**10.8**				**55.6**	**1.8**	**46**	**21**
									Years =	***0.16***			
Electrofished 6	5/8/12	395	414	920	15.6	16.3	32.4	April 20, 2011	8.8	384	6.8	171.5	76.7
7	5/25/12	435	450	1,150	17.1	17.7	40.5	April 20, 2011	8.8	401	8.3	211.5	94.6
8	7/9/12	435	455	1,075	17.1	17.9	37.9	April 20, 2011	8.8	446	8.3	211.5	94.6
9	10/25/12	395	410	750	15.6	16.1	26.4	April 20, 2011	8.8	554	6.8	171.5	76.7
10	10/25/12	420	440	895	16.5	17.3	31.5	April 20, 2011	8.8	554	7.7	196.5	87.9
11	11/15/12	390	415	1,100	15.4	16.3	38.8	April 20, 2011	8.8	575	6.6	166.5	74.5
	2012 6 Fish Average	**412**	**431**	**982**	**16.2**	**17.0**	**34.6**			**485.7**	**7.4**	**188.1**	**84.2**
									Years =	***2012 x = 1.33 yrs***	***2012 x = 5.6 inch / yr -->***	***Extrapolated/Projected****	
11 fish reported to date South Fork Res. Bel-Air Rb Summative:		***340.6***	***352.1***	***981.7***	***13.4***	***13.9***	***34.6***	***April 20, 2011***	***8.8***	***270.6***	***4.6***	***117.1***	***52.4***

Total clipped fish stocked in 2011 = 9,864

South Fork Reservoir 2011 -- 20*xx* Creel & Population Survey Lengths & Weights -- Eagle Lake Rainbow Trout with Left Pectoral fin clip

Fish Number	Creel Date	Fork Length(mm)	Total Length(mm)	Weight (g)	Fork Length (In.)	Total Length(In.)	Weight (ounces)	Date Planted	Avg. Size @ Stocking	Resident Days in Lake	Growth Increase (inches) / Year	Growth Increase (mm)	%Length Increase
Control Fish	**Stocked 4/25/11 @ x= 8.7 inches**	**221**	**221**	**120**	8.7	8.7	4.2	April 25, 2011	**8.7**	**0**	0.0	0.0	0.0
1	4/28/11	250	250	120	9.8	9.8	4.2	April 25, 2011	8.7	3	1.1	29.0	13.1
2	4/28/11	230	230	120	9.1	9.1	4.2	April 25, 2011	8.7	3	0.4	9.0	4.1
3	4/28/11	228	228	120	9.0	9.0	4.2	April 25, 2011	8.7	3	0.3	7.0	3.2
4	4/28/11	232	232	120	9.1	9.1	4.2	April 25, 2011	8.7	3	0.4	11.0	5.0
5	8/9/11	305	308	315	12.0	12.1	11.1	April 25, 2011	8.7	106	3.3	84.0	38.0
	2011 5 Fish Average	**249**	**250**	**159**	**9.8**	**9.8**	**5.6**			**23.6**	**1.10**	**28**	**13**
									Years =	***0.07***			
6	1/20/12	402	420	740	15.8	16.5	26.1	April 25, 2011	8.7	270	7.1	181.0	81.9
7	3/20/12	380	395	711	15.0	15.6	25.1	April 25, 2011	8.7	330	6.3	159.0	72.0
2012 Gill Net fish 8	5/2/12	420	430	800	16.5	16.9	28.2	April 25, 2011	8.7	373	7.8	199.0	90.1
Weight ?? 9	5/11/12	450	465	1,500	17.7	18.3	52.9	April 25, 2011	8.7	382	9.0	229.0	103.6
10	6/20/12	446	475	1,100	17.6	18.7	38.8	April 25, 2011	8.7	422	8.9	225.0	101.8
11	6/21/12	430	450	915	16.9	17.7	32.2	April 25, 2011	8.7	423	8.2	209.0	94.6
12	7/28/12	355	367	670	14.0	14.4	23.6	April 25, 2011	8.7	460	5.3	134.0	60.6
13	11/27/12	480	504	1,475	18.9	19.8	52.0	April 25, 2011	8.7	582	10.2	259.0	117.2
	2012 8 Fish Average	**420**	**438**	**989**	**16.6**	**17.3**	**34.9**			**405.3**	**7.85**	**199.4**	**90.2**
									Years =	***2012 x = 1.11 yrs***	***2012 x = 7.1 inch / yr -->***	***Extrapolated/Projected****	
13 fish reported to date South Fork Eagle Lake Rb Summative:		***334.7***	***343.9***	***573.9***	***13.2***	***13.5***	***20.2***	***April 25, 2011***	***8.7***	***214.4***	***4.5***	***113.7***	***51.5***

Total clipped fish stocked 2011 = 9,728