



***Montana Fish,  
Wildlife & Parks***

## 2014 Missouri River – Holter Dam Tailwater Monitoring

Status Report for PPL-Montana  
FERC Project 2188

Prepared by

Jason Mullen, Montana Fish, Wildlife & Parks  
Grant Grisak, Montana Fish, Wildlife & Parks

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In 2014 Montana Fish, Wildlife & Parks received \$23,535 from Northwestern Energy for monitoring the Missouri River and the fishery below Holter Dam as part of FERC license 2188.

### **Missouri River trout populations**

Two sections of the Missouri River downstream from Holter Dam were electrofished at night using aluminum jet boats. The Craig section is 5.6 miles long and located from river mile (Rm) 2.5 to 8.1. The Cascade section is 4.1 miles long and is located from Rm 24.2 to 28.3. Jet propelled boats were equipped with headlights and fixed boom-type electrofishing systems using stainless steel cable droppers suspended from each boom. Electricity from 240-VAC generators was converted to smooth DC using Coffelt or Smith-Root rectifying units. Brown trout estimates were conducted in each section in spring between the 28<sup>th</sup> of April and the 8<sup>th</sup> of May. Two jet boats were used in the Craig section, but only one boat was used in the Cascade section. Rainbow trout estimates were conducted in fall between the 29<sup>th</sup> of September and the 16<sup>th</sup> of October and two boats were used in each section. Data are analyzed using the MFWP FA+ statistical software (Montana Fish, Wildlife & Parks (MFWP), 2004). Population estimates are calculated using the partial Log-likelihood or modified Petersen's methods. The significance level for all estimates was  $\alpha \leq 0.05$ .

#### 2014 Missouri River trout population summary

In spring 2014 in the Craig section, the estimate of brown trout  $\geq 10$  inches long was 592 (SD 11) per mile (Figure 1). The mean for years when population estimates were calculated based on data since 1982 ( $n = 30$ ) was 577 per mile. We sampled 68 walleye and 45 burbot. The largest burbot was 26.5 inches long and weighed 3.8 pounds. The largest walleye was 30.1 inches long and weighed 13.8 pounds.

In fall 2014 in the Craig section, the estimate of rainbow trout  $\geq 10$  inches long was 4,783 (SD 154) per mile (Figure 1). For the fourth year in a row there was a higher than normal number of hatchery fish in the Craig section which allowed us to calculate an estimate of hatchery fish for only the fourth time ever, which was 417 (SD 126) per mile. The estimate of wild trout was 4,366 fish per mile, which was 133% of the long term average of 3,284 fish per mile based on annual estimates since 1982. We sampled 80 walleye and 82 burbot in fall 2014 in the Craig section.

In spring 2014 in the Cascade section, the estimate of  $\geq 10$  inch brown trout was 586 (SD 22) per mile (Figure 2). This was 149% of the long term average of 393 per mile. We sampled 2 walleye and 16 burbot. The largest walleye was 16.7 inches long and the largest burbot was 20.8 inches long.

In fall 2014 in the Cascade section, the estimate of  $\geq 10$  inch rainbow trout was 2,071 (SD 123) per mile (Figure 2). This was 130% of the long term average of 1,591 per mile. We sampled 18 walleye and 24 burbot in the Cascade section. The largest walleye was 25.5 inches long and 7.6 pounds. The largest burbot was 24.7 inches long.

### Missouri River - Craig section

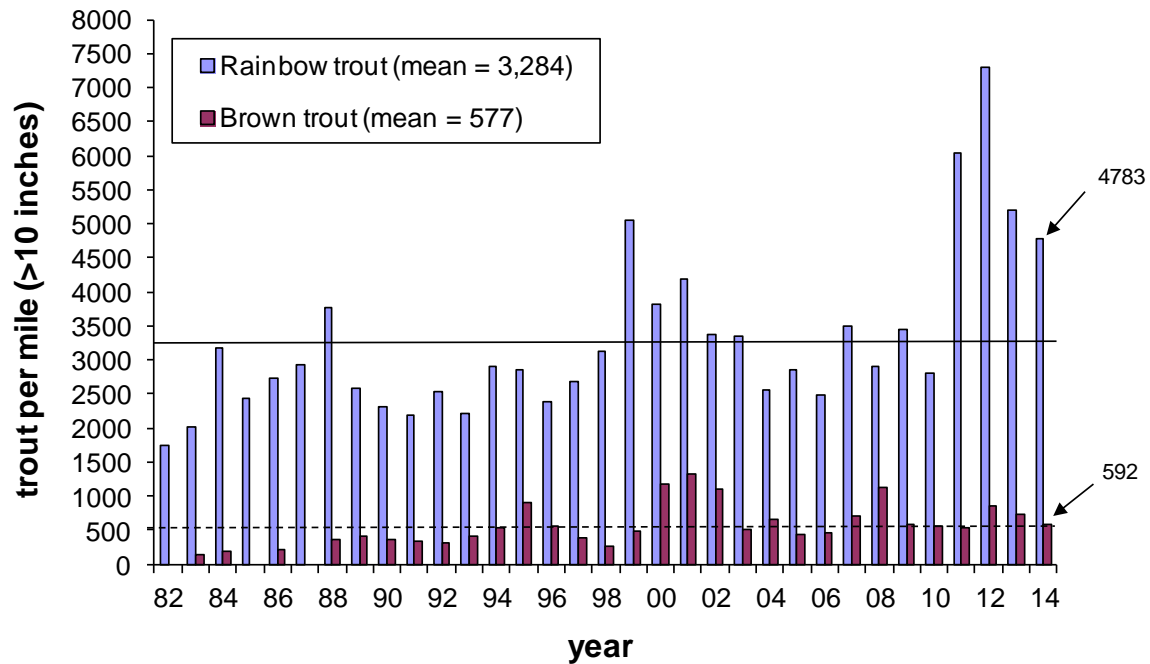


Figure 1. Estimated number of rainbow and brown trout greater than 10 inches per mile in the Craig section of the Missouri River 1982-2014.

### Missouri River - Cascade section

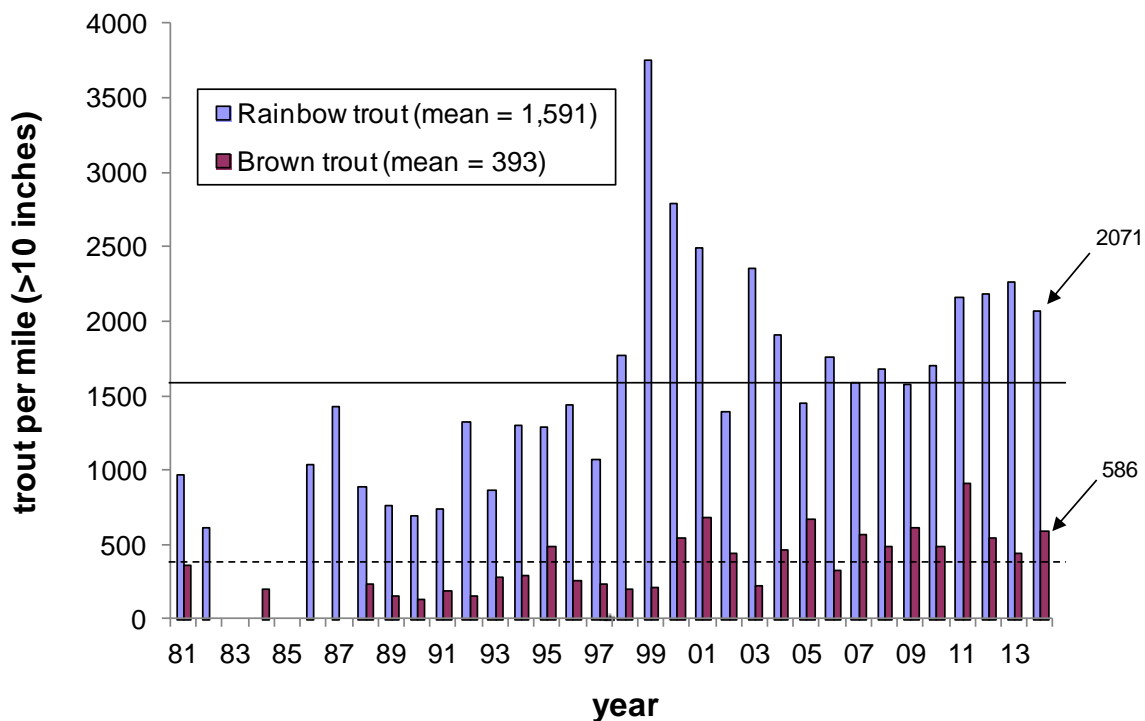


Figure 2. Estimated number of rainbow and brown trout greater than 10 inches per mile in the Cascade section of the Missouri River 1981-2014.

## Water flow

For the 2014 calendar year the Missouri River below Holter Dam had a mean discharge of 5,140 cfs, which was 96% of the 68 year mean ( $\bar{x}=5,335$  [3,120-8,493]) (Figure 3). This flow year ranked in the 50<sup>th</sup> percentile for the 68 year period of record. The maximum discharge in 2014 was 11,100 cfs, which occurred on May 30<sup>th</sup> through June 1<sup>st</sup> (Figure 4, Table 3).

## Water temperature

When monitoring water temperature of the Missouri River, regional personnel rely on the information provided from the USGS gauging stations as the ‘first line’ of notification. When temperature reaches the critical threshold of 70°F, we switch to data monitored by several thermographs located at strategic locations in each of the Missouri, Smith, Sun, and Dearborn rivers. These thermographs are used in making management decisions that could include providing recommendations to the regional Fish, Wildlife & Parks Commissioner to institute time of day angling restrictions of certain fisheries to reduce stress from angling on the trout populations. It is the policy of MFWP to request such closures when “...daily maximum water temperature reaches or exceeds 73° F (23° C) for at least some period of time during three consecutive days...”

In 2014 the USGS Wolf Creek Bridge site below Holter Dam recorded a maximum daily temperature of 68.9°F in August (Table 3). While temperatures were relatively high in August they did not warrant recommending angling restrictions on this valuable fishery.

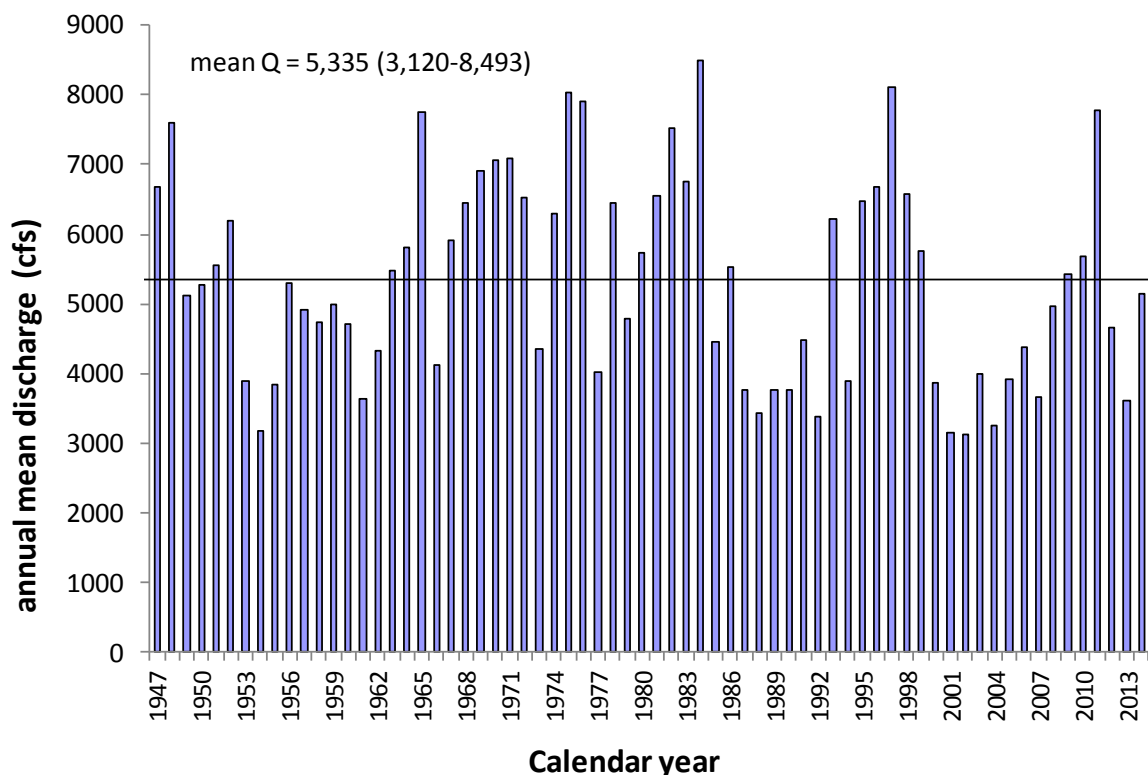


Figure 3. Mean annual flow for Missouri River below Holter Dam, 1947-2014.

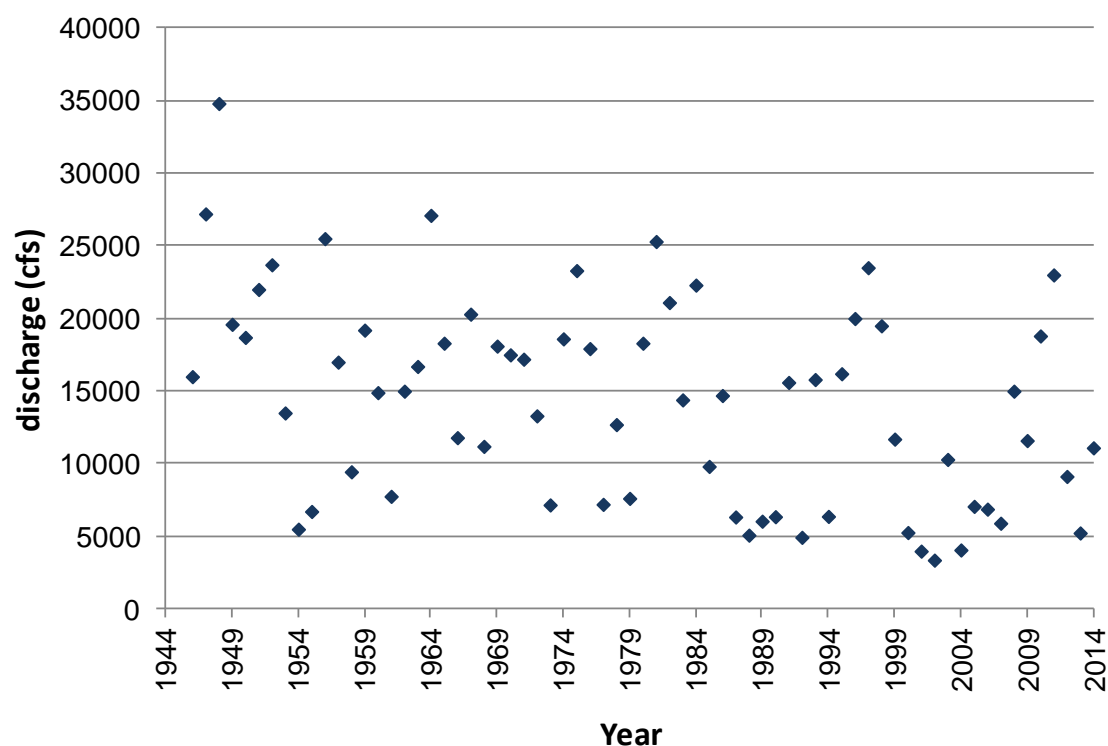


Figure 4. Maximum annual flow for the Missouri River below Holter Dam, 1946-2014.

Table 3. River flow (cfs) and temperature ( $^{\circ}\text{F}$ ) recorded at USGS station 06066500 (Missouri River below Holter Dam near Wolf Creek, Montana) for the calendar year 2014.

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>Missouri temp 2014</b>	mean	34.4	34.2	35.7	41.3	48.6	56.6	62.2	65.0	60.7	55.9	46.2	36.5
	min	33.8	33.8	34.0	37.2	44.1	51.6	57.6	61.0	58.6	52.7	38.5	34.3
	max	34.9	34.9	37.9	45.0	54.9	61.0	66.9	68.9	64.4	59.4	52.9	38.7
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>Missouri flow 2014</b>	mean	3170	3533	5698	7670	8893	5195	5263	4229	4194	4401	4639	4681
	min	3120	3080	4070	6740	8300	4030	4050	4020	4040	3900	4480	4470
	max	3360	4240	6910	8680	11100	11100	6850	4630	4700	4740	4850	5450

### Missouri River YOY walleye survey

We conducted 48 seine hauls in 2014 to evaluate young of the year (YOY) walleye abundance at 12 sites in a 47 mile-long reach of the Missouri River between Cascade and Great Falls. The protocol and site descriptions have been described by Grisak and Tribby (2011). Young of the year walleye abundance has been variable at these sites over the past six years. Overall abundance of YOY in 2014 was less than in the previous four of five years. (Figure 6). In 2009 and 2010, YOY abundance was highest in the upper sites (1-4). In 2011 there was a change in abundance where YOY walleye numbers were highest in the middle sites (6-9). In 2012 the highest abundance of YOY walleye occurred at sites (1-4). In 2013, YOY walleye were found

only at sites 3 and 12. In 2014, YOY walleye were collected from 6 of the 12 sites; however, 51 of the 60 walleye were collected from three sites (sites 2, 6, and 9).

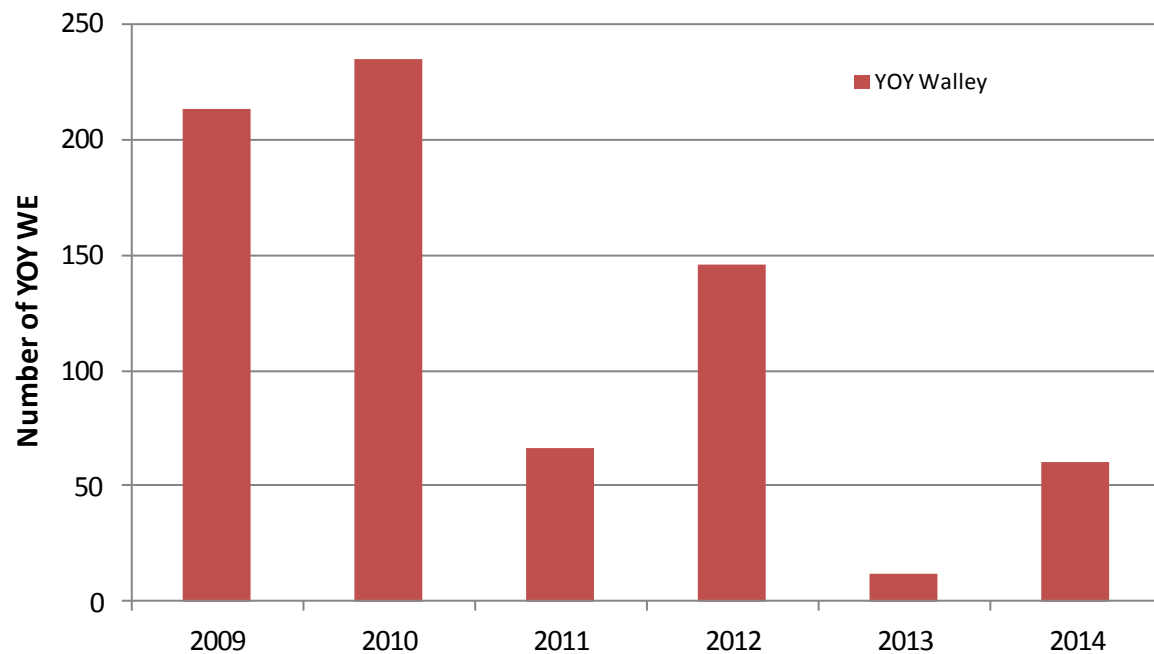


Figure 6. Total abundance by year, of young of the year walleye from seining sites along the Missouri River from Cascade to Great Falls, Montana.

### Missouri River trout spawning

In an effort to evaluate trout production in the main stem Missouri River, trout redds are counted when flows conditions are suitable for viewing and counting redds by helicopter. In 2010 and 2013, visibility was adequate to conduct rainbow trout redd counts. The protocol follows that described by Grisak et al. (2012) and the survey area spans from Holter Dam to the Pelican Point FAS (26.2 miles). In 2010, 1,644 rainbow trout redds were counted in this reach of river, compared to 3,113 rainbow trout redds in 2013 (Figure 7). Rainbow trout redd count surveys were not conducted in 2014. An attempt was made to count brown trout redds in the same stretch of the Missouri River in December 2014; however, conditions were too turbid for accurate counts.

## Missouri River Rainbow Trout Redds

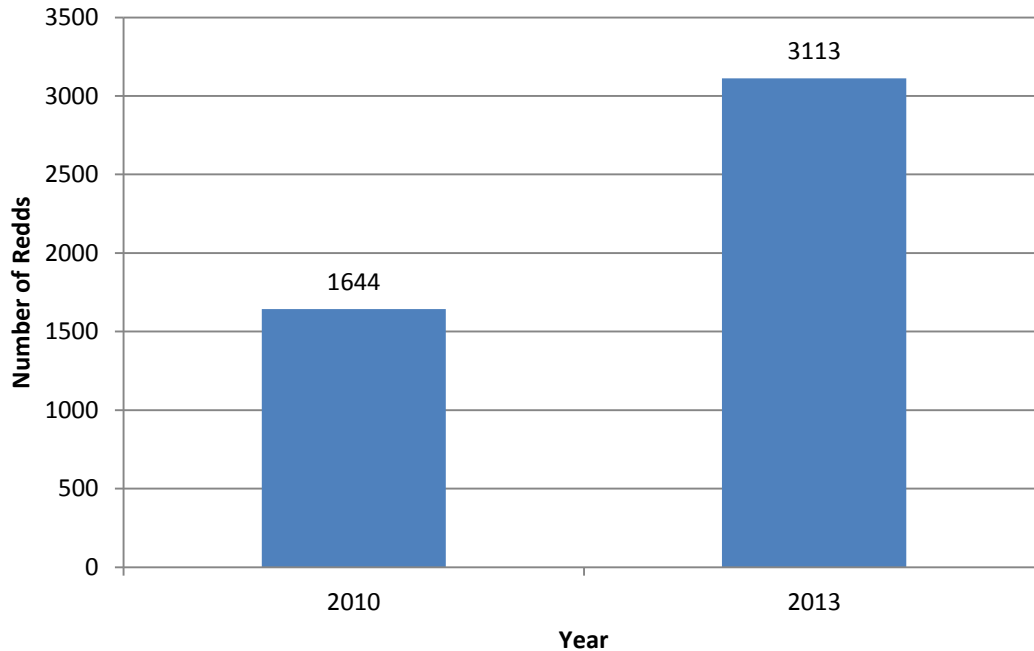


Figure 7. Rainbow trout redd counts from the Missouri River near Craig, Montana 2010, 2013.

Submitted by; Jason Mullen      October 2015

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## REFERENCES

- Grisak, G., B. Tribby and A. Strainer. 2012. An Evaluation of walleye in the Missouri River between Holter Dam and Great Falls, Montana. PPL-Montana MOTAC projects 771-09, 771-10, 759-11, 771-11 and Fisheries Bureau Federal Aid Job Progress Report Federal Aid Project Number F-113-R9, R10, R11, R12. Montana Statewide Fisheries Management. Great Falls.
- Grisak, G. and B. Tribby. 2011. 2010 Missouri River – Holter Dam tailwater monitoring report. Status report for PPL-Montana FERC Project 2188. Montana Fish, Wildlife & Parks, Great Falls.
- Montana Fish, Wildlife & Parks. 2004. Fisheries analysis + program. Version 02152005-VB6-A2K-CR85. Montana Fish, Wildlife & Parks, Bozeman, MT.