Jackson River Tailwater
Fishery Status Report
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Introduction/Background

The Jackson River Tailwater was born in 1982 with the creation of Lake Moomaw in Alleghany and Bath Counties, Virginia. The recreational portion of the tailwater is a 17 mile reach, from the stilling basin below Gathright Dam, to the water treatment plant intake in Covington. There is a two mile segment, from the water treatment plant in Covington to City Park in Covington that is legally navigable, but is not recommended for recreation due to heavy industry. Flows are carefully controlled by the U. S. Army Corps of Engineers to maintain downstream water quality, control flood events, and to provide recreation (Table 1). Negotiations during construction of Lake Moomaw resulted in an agreement to provide five public access areas to the river. At the same time, an agreement was struck to develop the tailwater into a self-sustaining trout fishery. An intake tower, consisting of ten, multi-level portals, was constructed to provide high quality water downstream of Gathright Dam.

From 1982 to 1989, surface water was exclusively released from Lake Moomaw into the Jackson basin. Summer water temperatures in the tailwater were too warm for a reproducing trout population. Smallmouth bass, rock bass, redbreast sunfish, chain pickerel, and stocked trout provided most of the angling during that 7 year period. Beginning in October, 1989 water was "pulled" from the cold, oxygenated layer of Lake Moomaw and the beginning of trout management in the Jackson River Tailwater was born. Water was taken exclusively from the thermocline until June, 1993, when it was "blended" from the warm, oxygenated surface of Lake Moomaw and the cold, anoxic layer deep in the lake. By doing this, the thermocline stayed intact much deeper into the summer, providing much needed habitat for trout in the lake. Today, water temperatures immediately downstream of Gathright Dam are usually between 58° and 60° F.

The first truckload of trout was stocked on an ice-cold day in December, 1989. Approximately 25,000 brown trout and 25,000 rainbow trout advanced fingerlings were stocked annually until 1997. Half-wild brown trout and Kamloops rainbows were stocked with Crawford browns and Wytheville rainbows to add genetic variety. After eight years of stocking, enough sexually mature trout remained in the tailwater, and natural reproduction began to take place. The current populations of rainbow and brown trout resulted from this aggressive stocking campaign.

The wild trout fishery is managed under a split regulation for rainbow and brown trout. Rainbow trout 12-16 inches are protected from harvest and brown trout <20 inches must be released. The daily creel limit is four trout (combined rainbow and brown). However, only one of four can be a brown trout over 20 inches. The intent of these regulations are to allow anglers to harvest the abundant rainbow trout <12 inches and by reducing the densities of these fish, increasing the growth of rainbows in the 12-16 inch slot. In addition, brown trout have the potential to reach trophy size and protecting them from harvest should increase the numbers of browns preferred by anglers. There are no gear restrictions for fishing in the Jackson River Tailwater.

Boat electrofishing has been the primary sampling tool to assess fish populations in the tailwater. A 14-foot jon boat has been specially designed to access and sample the small rivers of western Virginia. Originally, three permanent stations were established for long-term monitoring typifying the upper, middle, and lower reaches of the tailwater. Additional sampling sites were added over the past decade for various reasons. Current monitoring locations are approximately 0.2, 5.0, 6.3, 10.2, 15.5, and 17.0 miles downstream of Gathright Dam.

Status of the Fishery

Once the wild trout population became self-sustaining, stocking hatchery fish was discontinued in the mid 1990's. The rainbow trout population gradually increased in the upper portion of the tailwater and reached a plateau around 2005 (Figure 1). A decline in the rainbow population started to occur at DGIF's sampling station 5.0 miles downstream of the dam beginning in 2011 (Figure 1). The rainbow population has also fluctuated greatly over the past decade at DGIF's sampling station near Falling Spring (Figure 2). The rainbow population continues to increase in the lower reaches of the tailwater, but there has been a slight decline that began in 2013 (Figure 3). Rainbow densities immediately below the dam are highly influenced by spawning success and relative abundance of rainbows has dramatically increased over the past three years (Figure 4). Brown trout densities have steadily increased across the entire tailwater over the past 15+ years. However, brown trout numbers have always remained very low immediately downstream of the dam (Figure 4). The composition of brown and rainbow trout in the tailwater did not realistically change between 2013 and 2014 (Figure 5 & 6). Brown trout composition increases as you move downstream of the dam a few miles and then remains fairly consistent (Figure 7). The size distribution of both rainbow and brown trout has remained fairly consistent between over the past three years (Figure 8, 9, and 10). However, there was a statistical difference in the length frequency distribution for both adult rainbow and brown trout between 2013 and 2014. The trout fishery is currently dominated by rainbows <12 inches in length. Brown trout make up the majority of trout > 12 and 16 inches in the population. Browns >18 inches have become more numerous in recent years (Figure 10).

It can be difficult for biologists to determine if trout populations are indeed changing significantly. Trout numbers can change dramatically from year to year due to natural causes. In addition, biologist's capture numbers can vary greatly for many reasons. While the recent decline in both rainbow and brown trout abundance at several of DGIF's sampling stations is apparent, biologists find it difficult to answer two questions: 1) Is this decline significant compared to past fluctuations in trout abundance? 2) What factor(s) could be the cause?

Wild trout populations are primarily driven by spawning success. Stream flow can impact spawning success. Brown trout spawn from November to early December and rainbow trout March through early April in the Jackson River. Releases from Lake Moomaw through Gathright Dam are regulated and are predominantly consistent throughout the year. However, one of Gathright Dam's intended purposes is flood control and increased flow releases into the tailwater can occur anytime. The timing and duration of these increased releases can negatively impact spawning success of trout. Trout are most vulnerable to these high stream flows from the time they hatch up to a few months of age. This process is a common and natural occurrence in un-dammed streams with wild trout populations. Therefore, wide fluctuations in wild trout numbers from year to year in these streams can be common.

Age 0 brown trout (left) and rainbow trout (right) collected from the Jackson River Tailwater September 2014.

Angler harvest can also influence trout populations. However, angler harvest is not believed to influence trout populations in the Jackson River Tailwater. The most recent angler creel survey conducted by VDGIF on the tailwater (2007) indicated that 96% of the trout caught by anglers are released. Overall, wild trout populations are very dynamic and substantial changes in fish abundance from year to year are not uncommon. Biologists try to electrofish with the same equipment, at the same locations, and under similar environmental conditions each year to reduce any variability or sampling bias. Deviations from these "constants" can sometimes help explain changes in sampling data.

Pulsed Releases

The Jackson River downstream of Covington, Virginia to the confluence with the Cowpasture River was recently classified as "impaired" by the Virginia Department of Environmental Equality (VDEQ) through an EPA statewide assessment program. The impairment was benthic in nature and being caused by excessive attached algae and periphyton on the bottom of the river. The increase of benthic algae negatively impacts water quality and aquatic macroinvertebrates important at the bottom of the food chain. Scientists with VDEQ, VDGIF and the U.S. Army Corps of Engineers developed a plan to periodically release "pulses" of water from Gathright Dam to increase water velocity and flush or reduce the algae attached to the bottom of the river. These pulses were designed to mimic rain events that cause "flushing" flows in natural streams. The Jackson River downstream of Gathright Dam does not receive these periodic flushing flows because of the dam. Considerable research and planning went into determining the amount of water to release, the duration of each release, and the number of releases necessary to reduce the bottom algae. Timing of the pulsed releases was chosen to not interfere with spawning activity of trout in the cold tailwater below the dam or warmwater species in the warmwater reach of the Jackson River downstream of Covington. The timing and magnitude of the pulses were also developed to minimize impacts to recreational river users and adjacent landowners. These pulse releases only lasted for approximately one day at a time. VDEQ and VDGIF are monitoring the river to determine if these pulse releases are improving benthic habitat and aquatic organisms in the impaired reach of the Jackson River downstream of Covington. The dates of pulsed releases and flood control releases from Gathright Dam in 2013 and 2014 are listed in Table 1.

Table 1. Dates of pulse releases and flood control releases from Gathright Dam 2013-2014.

Pulse Releases 2013	Pulse Releases 2014	Flood Storage Releases 2013	Flood Storage Releases 2014
July 23	June 25	March 14-15	February 5-8
August 13	July 23	May 8-12	February 22-24
September 3	August 13	December 30-31	May 16-20
September 24	September 3		
October 15	September 24		

Fish Kill

On June 18, 2014 an angler reported seeing several dead and lethargic trout in the Jackson River Tailwater from upstream of Falling Spring downstream to Indian Draft. Rainbow trout, brown trout and fallfish were the species reported. VDEQ investigated and concluded in their report that trout mortality was estimated at seven fish per mile of stream. Water quality parameters measured during the investigation on June 19 were normal. VDEQ estimated that approximately 89 trout were killed in this event. VDEQ could not definitively determine the cause of the fish kill. The U.S. Geological Survey conducted a flow gage calibration on June 18 and to do so the water released from Gathright Dam was reduced for several hours. This activity also coincided with the warmest air temperature of the year to date in the mid 90's. One theory is that some trout became stranded in shallow side channels of the river and died from thermal stress. However, the exact cause of the fish mortality could not be determined. VDGIF and VDEQ have coordinated with the USACOE and taken steps to minimize the chance of this occurring in the future.

Summary

Either of these two events could be responsible for declines in trout numbers at specific reaches in the tailwater over the past 2-3 years. However, biologists do not feel that these declines are outside the limits of how wild trout populations could fluctuate naturally. A small increase in electrofishing catch rate of rainbow trout at Big Rock (5.0 miles from Dam), and a significant increase of fish directly below the dam in 2014 do not support the theory that trout numbers are down throughout the entire tailwater. Nor do these observations signify that pulsed releases or the fish kill in June 2014 are the cause of declines in fish abundance. It must be mentioned that DGIF conducted electrofishing surveys at Big Rock and Falling Springs sample stations the day after a planned pulse release in September. Even though stream flow returned to normal, electrofishing catch rate of trout could have been lower at these sites because trout had been temporarily displaced from their normal locations within the stream channel. DGIF plans to conduct future electrofishing surveys away from any unnatural flow augmentations. Annual monitoring will be conducted by VDGIF to track changes in the wild trout population.

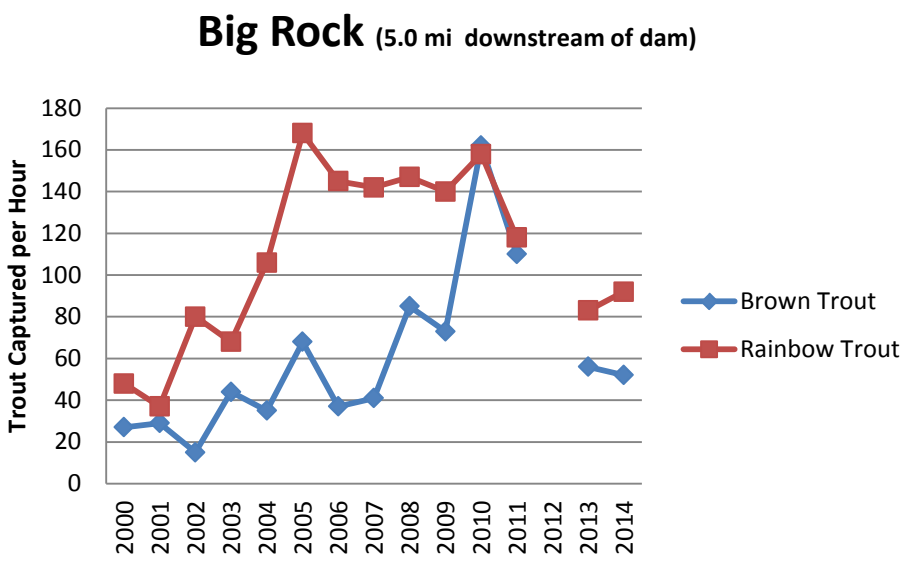


Figure 1. Annual relative abundance of trout at DGIF's Big Rock sampling station.

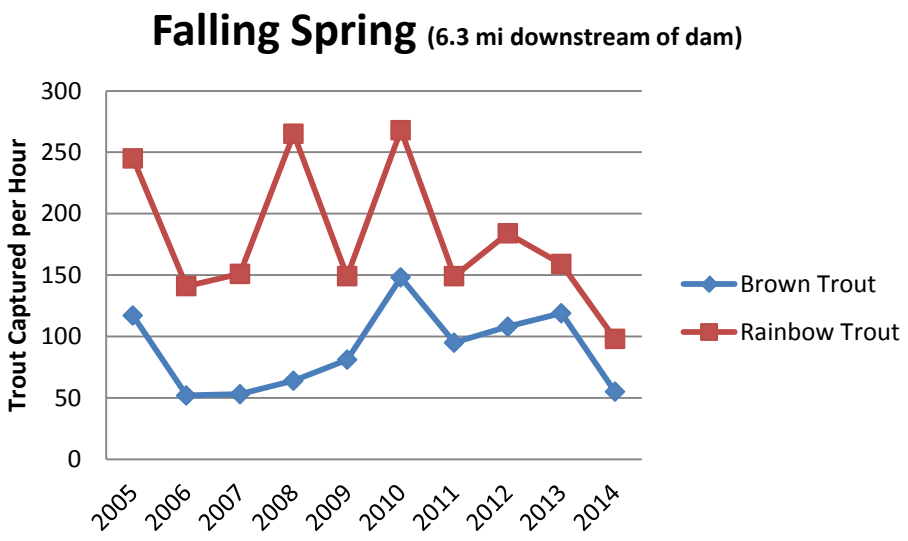


Figure 2. Annual relative abundance of trout at DGIF's Falling Spring sampling station.

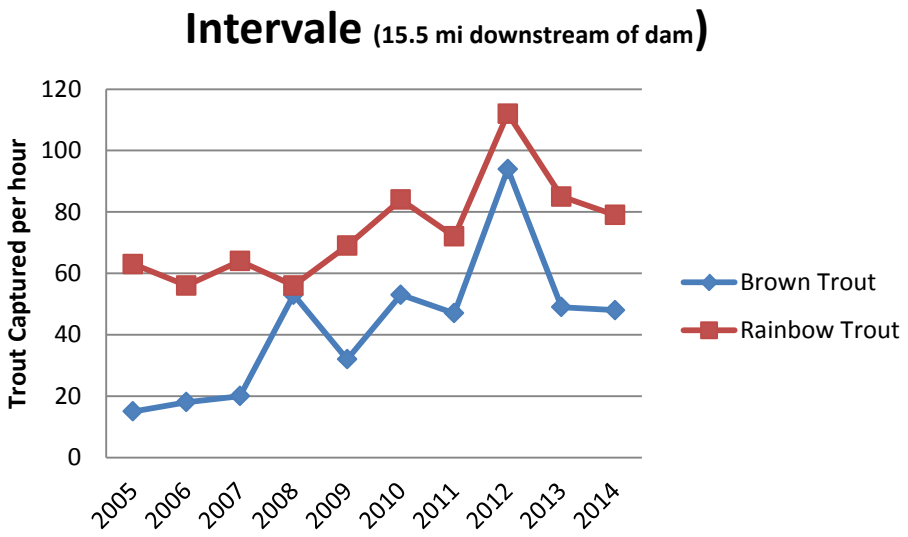


Figure 3. Annual relative abundance of trout at DGIF's Intervale sampling station.

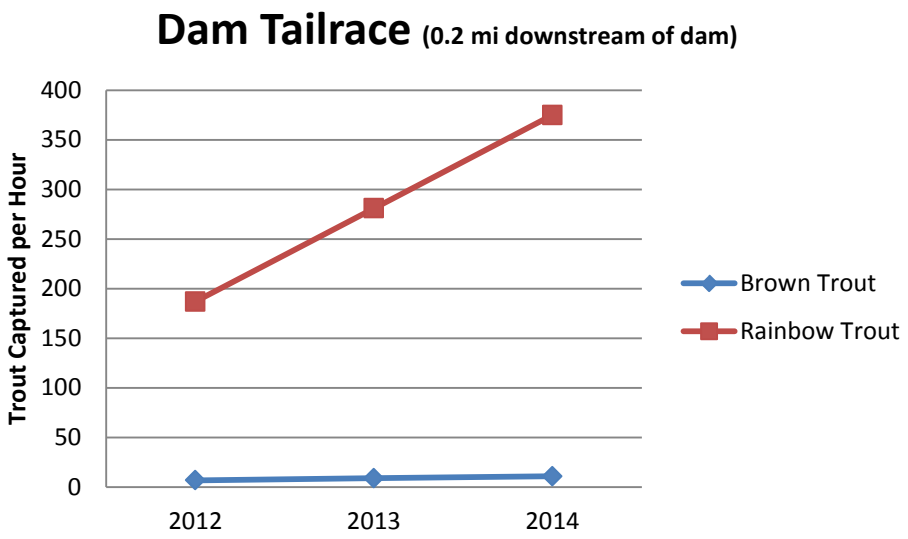
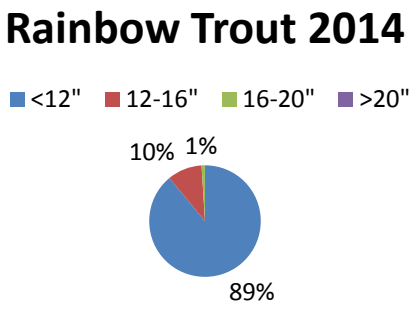


Figure 4. Annual relative abundance of trout at DGIF's dam sampling station.



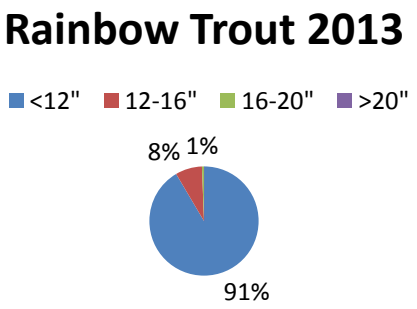
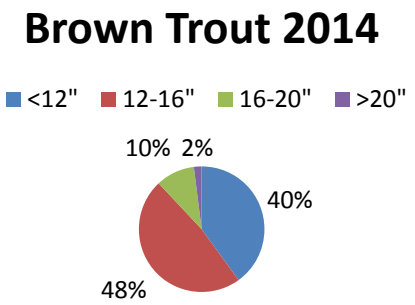


Figure 5. Size distribution of rainbow trout in the Jackson River Tailwater 2014 & 2013.



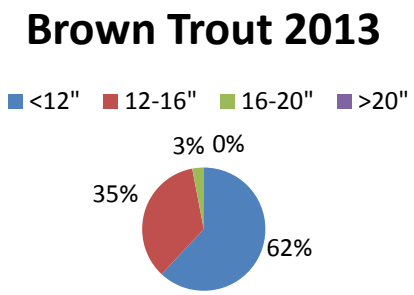


Figure 6. Size distribution of brown trout in the Jackson River Tailwater 2014 & 2013.

Typical brown trout (left) and Rainbow Trout (right) captured by DGIF during electrofishing surveys on the Jackson River Tailwater.

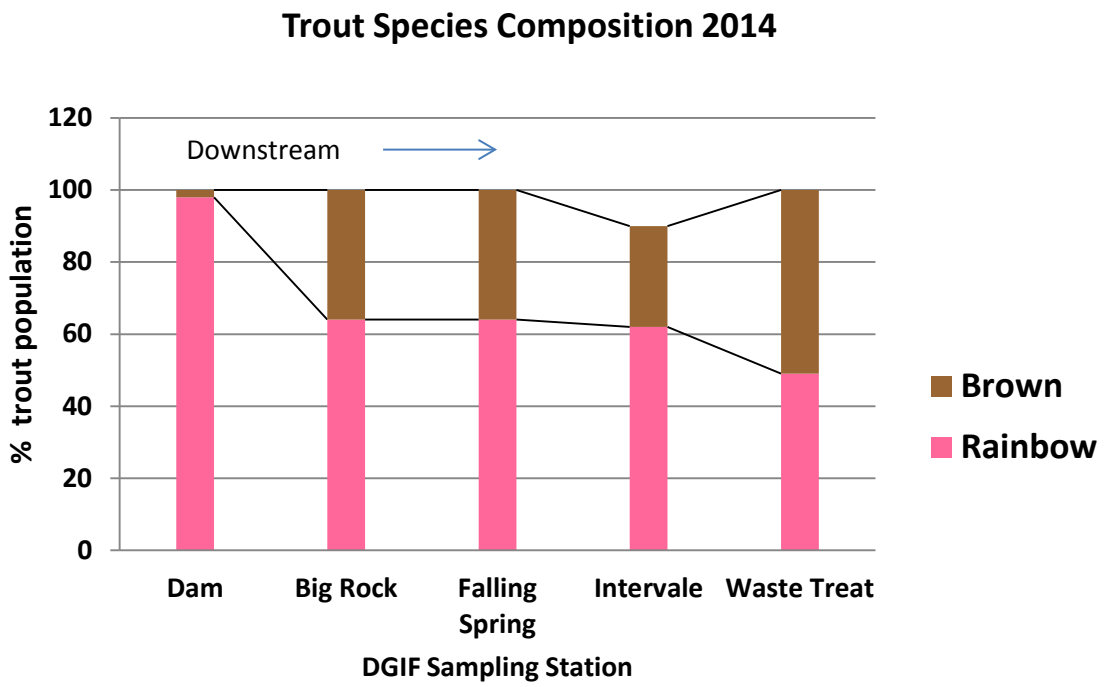


Figure 7. Trout composition by species at DGIF sampling station on the Jackson River Tailwater in 2014.

Jackson River Tailwater September 2014.

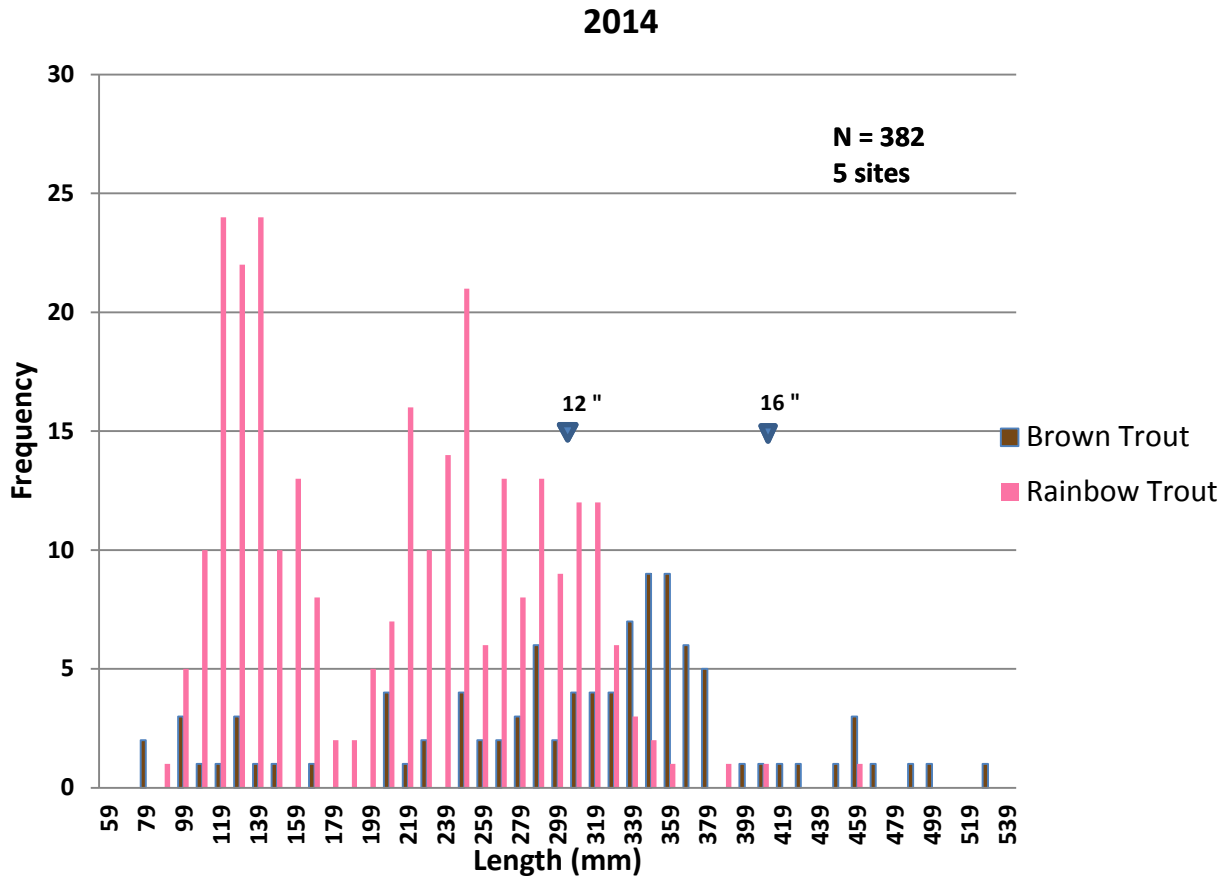


Figure 8. Length frequency of trout collected by DGIF from the Jackson River Tailwater in 2014.

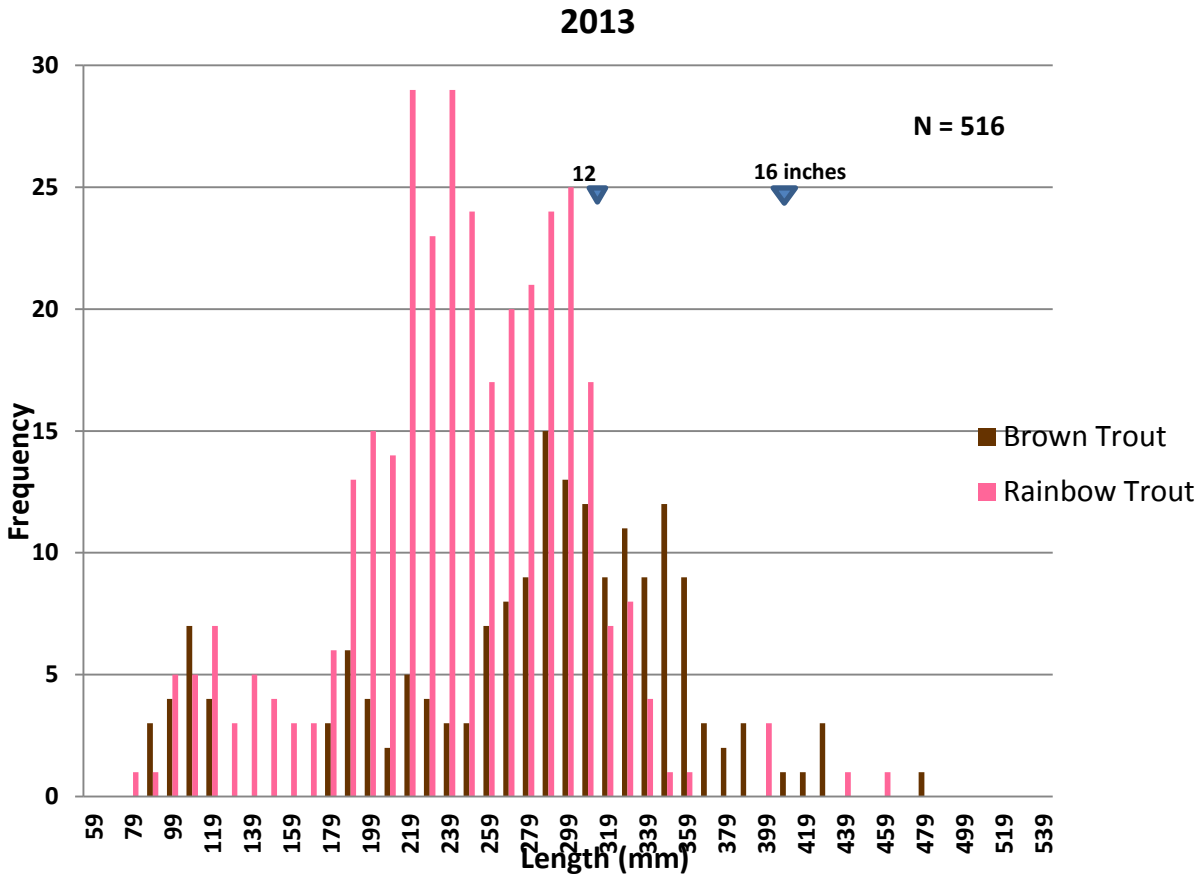


Figure 9. Length frequency of trout collected by DGIF from the Jackson River Tailwater in 2013.

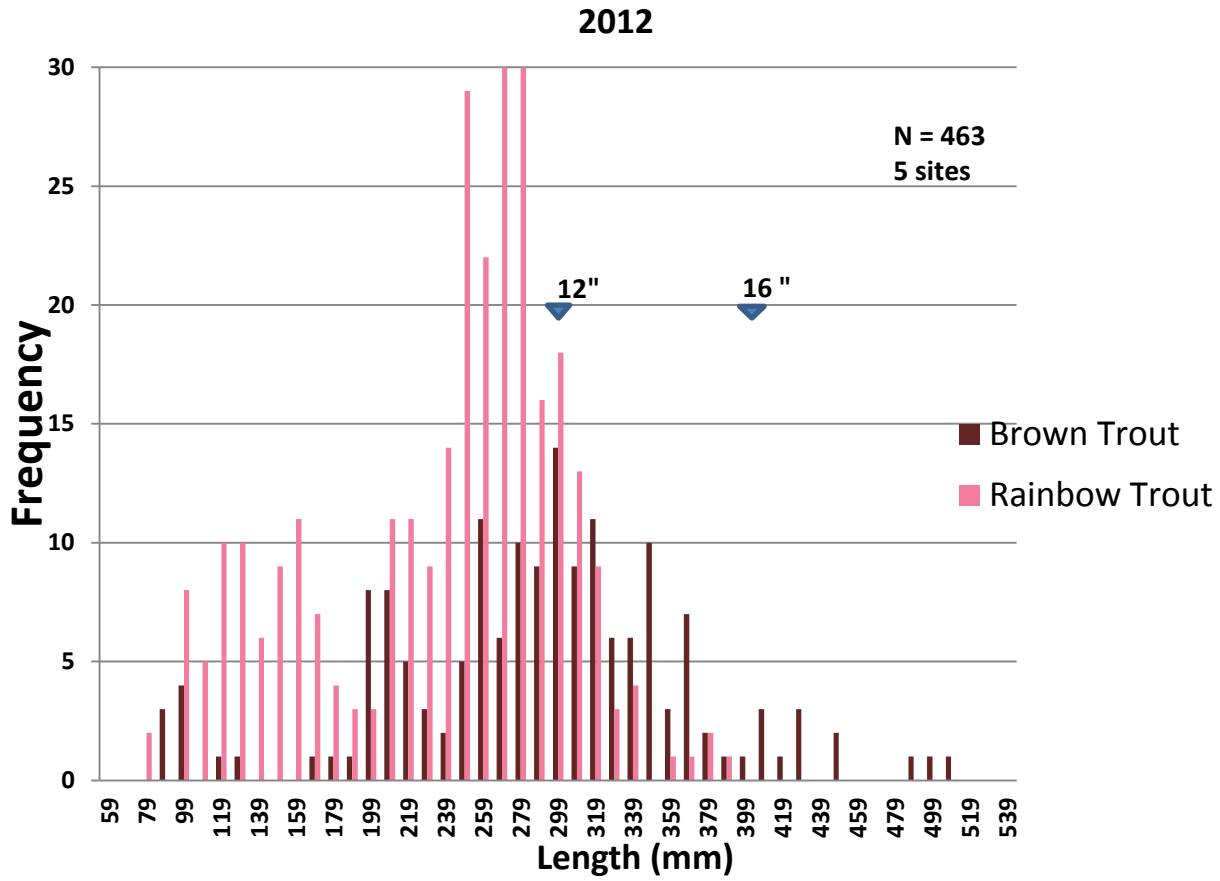


Figure 10. Length frequency of trout collected by DGIF from the Jackson River Tailwater in 2012.