The recovery rate of Brook Trout populations in the Loyalsock Creek watershed following catastrophic flooding.

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**Abstract**

In early September 2011, Tropical Storm Lee deposited over twelve inches of rain in the Loyalsock Creek watershed (north central Pennsylvania). Trees were uprooted, new substrate material was deposited and stream biota were decimated in this flooding event with peak flows reaching (69,100 cfs). As part of the PFBC Unassessed Waters Initiative, pre-flood brook trout populations were sampled in summer 2011 at 30 headwater stream study sites. Post flood samples were collected each summer at these sites between 2012 and 2015. After the September 2011 flood, results show the removal of most trout below 150mm in size across most of the study sites. 2012 yielded a large age-0 class, with low numbers of fish between 100 and 150mm in size. Results from 2013 show high recruitment of age-0 into age-1 year class, but continued low numbers of older fish. 2014 and 2015 yielded larger adult populations than previous years as young fish are recruited into older age classes. Results also show a decrease in the amount of age-0 fish since 2012. Results indicate that the age structure is recovering to pre-flood levels.

**Results**

- Total brook trout population has increased.
- Density has increased.
- Young of year make up most of the density in immediate years following flood.
- Many size classes were wiped out but are now returning.
- Slow recruitment into larger size classes.

**Conclusions**

2012
- Density increase was largely contributed to by the young of the year.
- Little competition which allowed a majority of the YOY to make it to year 1.
- Age classes between 75 and 150 mm were essentially eliminated.
- Majority of the population was young of the year.
2013
- Density shifted towards adult trout.
- Many YOY recruited into the next size class.
- Some of the other size classes began to appear again.

2014
- Density shifted towards adult trout again.
- The larger size classes became more prevalent in the population.
- Density shifted toward YOY.
- Most fish that survived after the flood are able to spawn, contributing to increased population.
- The size class distribution is continuing to shift back to the larger size classes.

Further analysis
- Location on watershed
- Amount of rainfall
- Changes in Age class size

**Sponsors and Support**


**References**

