2005 & 2006 Fairmount Fish Ladder

Passage Data Compared to Historical Counts

The Schuylkill River in southeastern Pennsylvania once supported massive spring runs of anadromous fishes until the construction of dams in the early 1800's. American shad (*Alosa sapidissima*), striped bass (*Morone saxatilis*), and river herring (alewife *Alosa pseudoharengus* and blueback herring *A. aestivalis*) ascended the Schuylkill River as far upstream as Pottsville (160 rkm), but have not done so since 1820, when Fairmount Dam (13.6 rkm) was built. The dam served as a physical barrier to migratory fishes, completely blocking upstream movement and access to critical spawning grounds.

In 1979, a vertical slot fish passage facility was constructed on the west side of Fairmount Dam, however, very few anadromous species were utilizing the passage and the fishway was abandoned by 1984. No fish counts were conducted from 1984 to 2004, until Philadelphia Water Department biologists took responsibility for maintenance and operation of the fishway and developed a digital video monitoring system to record fish passage. An underwater viewing room and window allows direct observation of fishes swimming through the fishway and is the primary means for evaluating fish passage.

In 2004, there were 6,438 fish of 23 species that ascended Fairmount fishway, including 91 American shad, 161 striped bass, and 2 river herring. A total of 8,017 fishes representing 25 species were counted passing through the fishway in 2005, including 41 American shad, 127 striped bass, and 5 river herring.

In 2006, a total of 16,850 fishes representing 26 species were counted passing through the fishway including 345 American shad, 9 hickory shad, 61 striped bass, and 7 river herring, marking an astonishing 279% increase in American shad passage from 2004 to 2006. The interannual trend in relative abundance of American shad below Fairmount Dam increased, as did overall shad passage trends in the fishway. Continued monitoring of fish passage will be a critical component in assessing anadromous fish restoration efforts on the Schuylkill River.

Scientific Name	Common Name	Status	2004[a] Number Passed	2005[b] Number Passed	2006[c] Number Passed
Alosa mediocris	hickory shad	NA	0	0	9
Alosa sapidissima	American shad	NA	91	41	345
Ameiurus catus	white catfish	NR	6	1	6
Ameiurus spp.	bullhead catfish	NR	0	0	2
Ambloplites rupestris	rock bass	IR	0	1	0
Anguilla rostrata	American eel	NC	32	70	34
Catostomus commersoni	white sucker	NR	731	1767	2887
Carpiodes cyprinus	quillback	NR	1807	2042	2631
Ctenopharyngodon idella	grass carp	I	2	0	1
Cyprinella analostana	satinfin shiner	NR	0	2	0
Cyprinus carpio	common carp	IR	401	1197	2215
Dorosoma cepedianum	gizzard shad	NR	691	553	2899
Ictalurus punctatus	channel catfish	IR	1816	1663	3421
Lepomis auritus	redbreast sunfish	NR	13	3	4
Lepomis gibbosus	pumpkinseed sunfish	NR	0	7	1
Lepomis macrochirus	bluegill sunfish	IR	22	147	276
Lepomis species	unknown sunfish		72	10	2
Micropterus dolomieui	smallmouth bass	IR	143	124	1225
Micropterus salmoides	largemouth bass	IR	11	10	42
Morone americana	white perch	NR	55	105	112
Morone saxatilis	striped bass	NA	161	127	61
Morone saxatilis x Morone chrysops	hybrid striped bass	IR	20	16	48
Oncorhynchus mykiss	rainbow trout	I	7	13	16
Pylodictis olivaris	flathead catfish	IR	68	43	466
Alosa aestivalis or pseudoharengus	River Herring	NA	2	5	7
hybrid trout	hybrid trout	I	0	8	40
Salmo trutta	brown trout	I	4	7	5
Stizostedion vitreum	walleye	IR	57	33	84
	unknown		172	14	11
	unknown catfish		12	0	0
	unknown minnow		3	7	0
	unknown shad		32	0	0
	unknown trout		7	1	0
TOTAL			6438	8017	16850

NA = native anadromous
NC = native catadromous
NR = native resident
IR = introduced resident
I = introduced

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Passage Data Compared to Historical Counts

1. American shad

2006 counts of 345 American shad were the highest ever. Previous high from counts made from 1979-1984 over various time periods and months was 22 in 1981 when counts were made from 10 AM to 8 PM, 3/30/81 to 6/13/81. The only previous 24 hr. counts were in 1979 when two shad were counted between 4/30/79 and 5/31/79.

2005 counts of 41 American shad were lower than 2004 (91 shad) but still higher than counts from the 1970's and 1980's. The missing video from several critical days in May and June is a likely explanation for the reduced numbers.

2. Striped bass

A record high count of 161 striped bass was observed in 2004. The 2005 and 2006 counts were slightly less with 127 and 61 respectively, but still much greater than the historical count of only one striped bass counted from 1979-1984.

3. Striper hybrids

The 20 hybrid striped bass observed in 2004 represented a new species for Fishway counts. Sixteen striper hybrids were counted in 2005, and a record count of 48 in 2006.

4. Quillback

The previous record count of 1807 quillback from 2004 was surpassed in 2005 with a record number of 2042 quillback and again in 2006 with 2631 passing through the Fishway. The previous high count was 99 in 1982 when counts were made from 10 AM to 8 PM, 4/12-6/25/82.

5. River herring

Two river herring seen in 2004 and five in 2005 were the lowest number ever counted. There was some improvement with seven counted in 2006. Highest previous count was 305 in 1981. Large groups of 400 to 500 herring have been observed in the lower pools of the Fishway, however, few of them make it past the viewing window. Several river herring have been found in the stomach contents of flathead catfish removed from the Fishway, suggesting possible predation of herring.

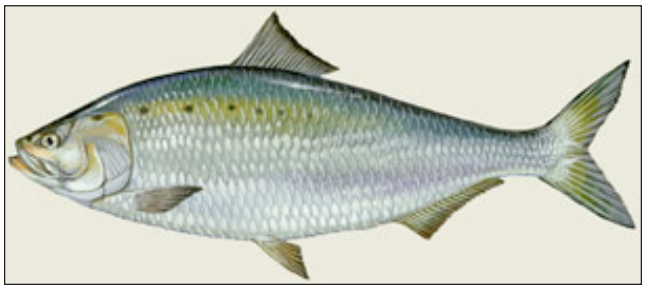
6. Flathead Catfish

A new species in 2004 for Fishway counts, there were 68 observed in 2004, 43 in 2005, and 466 in 2006. This commonly observed "resident" is believed to enter the Fishway and not leave, in order to take advantage of the abundant supply of easily available prey fishes.

7. Grass Carp

Two observed in 2004, a new Fishway species. No grass carp were observed in 2005, but one was observed in 2006.

8. Low **brown bullhead** counts (none in 2004 and 2005; two in 2006) and low **sunfish** counts may be something to watch in the future because of flathead catfish predation. We have had these low counts in the past as well as much higher counts, so we will need more information through future counts.



9. Walleye

Schuylkill River walleye population is growing, as reflected in the count of 57 in 2004, 33 in 2005, and 84 in 2006. The previous high count was 21 in 1981.

10. Channel catfish

In 2004 1816 were counted, with 1663 in 2005, and a record 3421 in 2006. The previous high count was 1436 in 1979, the only other year when 24 hr. counts were done. Channel catfish are prevalent at night in the Fishway.

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Philadelphia Water Department