

FISHERIES SAMPLING REPORT
Mill Brook and Tributaries - West Tisbury
Basin: Marthas Vineyard (97) SARIS Code: 63625
September 18, 2012



Figure 1. Wild brook trout (*Salvelinus fontinalis*) sampled in Mill Brook, West Tisbury, September 12, 2012.

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The purpose of the fisheries survey of Mill Brook (SARIS 97 – 63625) and its tributaries in West Tisbury, Marthas Vineyard was to officially document reported wild brook trout populations. Mill Brook is one of the major streams on the island and one of at least two Mill Brooks on Martha's Vineyard (There is another one in Chilmark (SARIS 97- 63550). The brook flows for at least 2.7 miles from its headwaters to Old Mill Pond at a gradient of 29.6 feet per mile. From Old Mill Pond it flows into Tisbury Great Pond, a brackish pond which is periodically opened to the sea.

Dr. Jerome V.C. Smith, a medical doctor and former mayor of Boston, referring to the brook trout of Mill Brook remarked:

"In no place, however, do we remember to have seen them in such abundance as in Duke's County, upon Martha's Vineyard... It was here in the month of November last, and of course in their spawning time; while returning home from a ramble among the heaths and hills of Chilmark and Tisbury, that crossing the principal brook of the island, our attention was attracted towards the agitated state of the water, and never do we recollect so fully to have realized the expression of its being "alive with fish," as on this occasion."
(Smith (1833), pages 346 and 347)

Mill Brook originates in springs and wetlands in Chilmark and flows eastward just south of North Road before being impounded by Fisher Pond, and then flows (along With Witch Brook) into Crocker Pond and then (Along with an unnamed tributary) into Priesters Pond, it then crosses South Road, is impounded by Berresfords Pond, and then flows into Littlefields Pond, crosses Scotchman's Lane and then flows into Old Mill Pond. Below Mill Pond, it flows for a short distance and receives numerous springs before entering Tisbury Great Pond.

Mill Brook has been annually stocked by the MDFW with about 200-300 catchable sized trout since at 1968. In recent years stocking of catchable sized brook and rainbow trout has been concentrated in Old Mill Pond. Although wild brook trout have been reported from this system, MDFW survey records did not reflect this and this survey was conducted to update fisheries survey information for this brook.

Methods

Sampling crew consisted of Steve Hurley, Jeff Breton, Aaron Best, Steve Wright and Prudy Burt. The river was sampled at multiple sites (Figure 2, Table 1) by sampling in an upstream direction with a Smith Root Model 12- B backpack electrofisher (500-700 volts, 0.2-0.5 amps, I5 switch settings). All fish captured were identified to species and measured for total length in mm. Sampling followed standard MassWildlife Stream survey protocols.

Results and Discussion

A total of eight fish species were sampled in Mill Brook and two small tributaries (Witch Brook and an un-named tributary to Priesters Pond (Table 2.) Reproducing wild brook trout were found in the upper reaches of Mill Brook and in the Witch Brook tributary (SARIS 97-63650) as well as in an un-named tributary to Priesters Pond. A single adult (apparently wild) brook trout was captured below a small impoundment (Berresfords Pond) on the river. No brook trout were found in the sampling area below Old Mill Pond and above the Town Cove section of Tisbury Great Pond. Brook trout were

not sampled in previous surveys of Mill Brook (Table 3).

Large numbers of American eels were captured in the lowest site surveyed on the river below the first dam (Old Mill Pond) above the brackish Tisbury Great Pond. American eel, anadromous and marine species have ready access to the Tisbury Great Pond during periodic man-made and natural openings of the pond to the sea (Taylor 2005) but the openings may not coincide with peak migration times for elvers. American eels were present at the majority of sites sampled but abundance appears to be reduced compared to a brook with unimpeded access to marine waters. Passage of eels and other fishes may be impeded by the numerous dams along the main stem of Mill Brook.

No American brook lamprey, a state listed species, were captured in this survey indicating they are confined to the lower reaches of the brook. In the Mashpee River, the occurrence of the loose detritus favored by the ammocoetes of the brook lamprey is found in the upper freshwater tidal areas of the brook.

Wild brook trout populations are persisting in Mill Brook watershed where suitable cold water habitat exists but their access to tidal areas is blocked by the numerous dams and barriers which do not allow the anadromous life history variant known locally as “salters” or in Smiths early 1800s as “sea trout”. The small stream coldwater habitats of Mill Brook are a habitat at risk due to climate change.

Mill Brook has been highly modified with the presence of numerous impoundments that warm the waters of the brook, trap sediment, increase habitat fragmentation and reduce fish passage.

Recommendations:

- Mill Brook (SARIS 97-63625), Witch Brook (SARIS 97-63650) and the un-named tributary to Priesters Pond should all be listed as CFRs (Coldwater Fisheries Resources).
- Establish stream temperature logging stations at multiple sites in the Mill Brook Watershed to assess present status and long term trends.
- Consideration should be given to removing un-needed dams or culverts and updating road culverts to Massachusetts Stream crossing

standards in the Mill Brook system to increase river connectivity and fish passage and improve cold water stream habitats.

- An inventory of dams and culverts in the Mill Brook watershed should be made with ownership status, condition, fish passage, etc.
- Landowners should be encouraged to increase riparian buffer zones to improve shading and woody structure in Mill Brook and its tributaries.
- Fisheries surveys should be conducted on the upper reaches of Mill Brook to further document the existence of brook trout in this area.

References

Taylor, Jo-Anne, 2005. Here Today, Gone Tomorrow: Tisbury Great Pond - Breach the Beach. Marthas Vineyard Times, September 1 - 7, 2005. Available at: http://www.mvtimes.com/news/09012005/weekly_stories/beaches.html

River and Stream Continuity Partnership. 2012. Massachusetts River and Stream Crossing Standards. Wildlife Habitat Protection Guidance, Appendix E. Available at: http://www.streamcontinuity.org/pdf_files/MA%20Crossing%20Stds%203-1-11%20corrected%203-8-12.pdf

Stream Crossing data form: http://www.streamcontinuity.org/pdf_files/Continuity%20Project%20Road-Stream%20Crossing%20Data%20Form%205-14-12.pdf

MassWildlife Climate Change: http://www.mass.gov/dfwele/dfw/habitat/cwcs/cwcs_climate_change_reports.htm

Smith, Jerome V.C. 1833. Natural history of the fishes of Massachusetts, embracing a practical essay on angling. Allen and Ticknor, Boston. Available at: http://books.google.com/books/about/Natural_history_of_the_fishes_of_Massach.html?id=BwE_AAAAYAAJ

Data Files (In Southeast Wildlife District Files)

GPS tracks
GPS waypoints
Raw Data Sheet Scans
Excel File

[Pictures](#)
[Figure and Table showing sampling sites](#)
[Table showing result of 2012 surveys](#)
[Table of previous surveys in Mill Brook](#)



Figure 2. Young-of-year brook trout captured in Mill Brook showing that this is a self-sustaining population of wild brook trout.



Figure 3. Top view of a tessellated darter from Mill Brook, West Tisbury.



Figure 4. Sampling section in upper reaches of Mill Brook showing good riparian canopy.



Figure 5. American eel from Mill Brook, West Tisbury, September 18, 2012.



Figure 6. Chain pickerel young-of year (note nearly vertical bar below eye, in a redfin pickerel this angles backward).



Figure 7. A brook trout, American eels and tessellated darter.



Figure 8. Banded killifish.



Figure 11. Golden shiner from Mill Brook



Figure 9. Habitat where adult brook trout was collected below small impoundment.









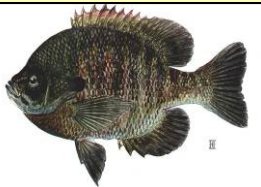



Figure 10. A nice wild brook trout from the Mill Brook West Tisbury watershed, September 2012.



Figure 11. Typical fish passage obstruction caused by a dam in Mill Brook Watershed, Old Mill Pond, West Tisbury (photo courtesy of Michael Chelminski).

Table 2. Fish Species of Mill Brook, West Tisbury, Martha's Vineyard

Fish Illustrations courtesy of New York Department of Environmental Conservation and Cornell University http://fish.dnr.cornell.edu/nyfish/fish.html		
	Common Name	Family –Family Common Name Scientific Name
Petrymyzontidae – lampreys		
	American brook lamprey	<i>Lampetra appendix</i>
(picture of silver lamprey, a similar species)		
Anguillidae - freshwater eels		
	American eel	<i>Anguilla rostrata</i>
Ictaluridae - bullhead catfishes		
	Brown Bullhead	<i>Ameiurus nebulosus</i>
Salmonidae – trouts		
	Brook trout	<i>Salvelinus fontinalis</i>
Esocidae – pikes		
	Redfin pickerel	<i>Esox americanus</i>
	Chain pickerel	<i>Esox niger</i>
Cyprinodontidae – killifishes		
	Banded killifish	<i>Fundulus diaphanus</i>
Cyprinidae - carps and minnows		
	Golden shiner	<i>Notemigonus crysoleucas</i>
Centrarchidae – sunfishes		
	Bluegill	<i>Lepomis macrochirus</i>
Percidae – perches		
	Tessellated darter	<i>Etheostoma olmstedii</i>

Factories and saw-mills have done their part towards the work of extermination, and the destructive *net* bids fair to do the rest. But though much diminished from these causes, there are more or less waters all over this state, and particularly in Plymouth county, and Barnstable county on Cape Cod, where the fish live and thrive in the undisturbed possession of their element.

In no place, however, do we remember to have seen them in such abundance as in Duke's county, upon Martha's Vineyard ; and it is perhaps from this very circumstance that they are held in so little estimation, the preference, as an article of food, being given to the silvery " neshaw eel," as it is called ; neither has the pleasure of taking them ever entered into the minds of the people. It may well be supposed then, how favorable these circumstances must have proved, not only to their preservation and wonderful increase, but also to their attaining that respectable growth which entitles them to the name of "*old settlers*." It was here in the month of November last, and of course

in their spawning time, while returning home from a ramble among the heaths and hills of Chilmark and Tisbury, that crossing the principal brook of the island, our attention was attracted towards the agitated state of the waters, and never do we recollect so fully to have realized the expression of its being "alive with fish," as on this occasion. As we carelessly descended the course of the brook, they were constantly rushing before us, but on a closer and more careful inspection, they might be discerned lying dormant in the gravelly shallows with their back fins out of water, watching their spawn, occasionally darting out, as danger in the shape of some unwelcome intruder approached the object of their care.

Departing once more from the intention of confining these remarks to the trout of Massachusetts alone, it may be here stated that with the exception of the Vineyard alone, there is no place within our knowledge where they appeared to be so numerous as in the river at *Dennysville*, in the state of Maine. They were in all respects like those we have been describing. They were found in all parts of the river, but more particularly in certain spots where a cold brook entered and mingled with its waters, called *trout-holes*; in such places they were congregated in immense numbers.



Figure 1. Fisheries sampling sites on Mill Brook in West Tisbury.

Table 1. Locations of sites sampled in the Mill Brook Watershed, September 18, 2012.

Site	Waterbody	Location	Description	Effort (m)	Effort (Secs)	Ave. Width (m)	Latitude	Longitude	Temperature (C)	Conductivity (uS)
1a	Mill Brook	below cart crossing	Deep pool below culvert			2	41.39808	70.69862	15.4	87
1b	Mill Brook	Above Cart crossing in Woods Preserve	Nicely shaded, gravel bottom, less than on inch average depth	60	301	2	41.39808	70.69862		
2	Mill Brook	Below Fisher Pond	Wide, shallow, gravel and sand bottom	100	551	3	41.39929	70.68969	18.8	75
3	Mill Brook	Head of town cove	Widestream burr-reed patches, sand and silt with some cobble, numerous spring seeps	60	496	4	41.38042	70.67004	17.9	85
4a	Mill Brook	Above Berresford Pond	Pooled above pond, heavy silt deposits then silt over cobbles	100	377	2	41.398671	70.673191	20.8	75
4b		Below Pond	Trout taken below undercut bank with root wad	25	215	2	41.39842	70.67328	19.7	75
5	Witch Brook	North Road crossing upstream	Small tributary, partially cleared to stream edge upstream of culvert	60	203		41.40350	70.68595	18.1	67
6	Un-named tributary to Priesters Pond	Pool below North Road and Upstream of Road	Small tributary, deep pool below culvert	80	241	2	41.40393	70.68050	16.1	85

Table 2. Number of Fish (and lengths in mm) of Fish Species captured in Mill Brook, West Tisbury, September 18, 2012.

Common Name	Family – Family Common Name <i>Scientific Name</i>	Mill Brook Pool below cart crossing	Mill Brook Woods Preserve above cart road	Mill Brook Below Fishers Pond	Witch Brook	UT-Priesters Pond	Mill Brook Above Berresford Pond	Mill Brook Below Berresford Pond	Mill Brook Head of Town Cove
	Effort (meters)		60	100	60	80			60
	Effort (seconds)	42	301	551	203	241	377	215	496
	Latitude	41.39808	41.39808	41.39929	41.40350	41.40393	41.398671	41.398242	41.38042
	Longitude	70.69862	70.69862	70.68969	70.68595	70.68050	70.673191	70.67328	70.67004
	Site Number (by time)	1a	1b	2	5	6	4a	4b	3
Anguillidae - freshwater eels									
American eel	<i>Anguilla rostrata</i>	observed	2 (150-300)		1		2 (160-170)	2 (170-290)	55+ Less than half caught
Ictaluridae - bullhead catfishes									
Brown Bullhead	<i>Ameiurus nebulosus</i>						2 (46-105)		1 (133)
Salmonidae - trouts									
Brook trout	<i>Salvelinus fontinalis</i>	8 (67-163)	33 (57-151)	33 (58-169)	3 (110-184)	5 (88-221)		1 (195)	
Esocidae - pikes									
Chain pickerel	<i>Esox niger</i>								7 (125-221)
Cyprinodontidae - killifishes									
Banded killifish	<i>Fundulus diaphanus</i>					4 (61-70)		1 (82)	
Cyprinidae - carps and minnows									
Golden shiner	<i>Notemigonus crysoleucas</i>					3 (102-118)	22 (80-122)		
Centrarchidae - sunfishes									
Bluegill	<i>Lepomis macrochirus</i>						2 (95-103)		2 (92-93)
Percidae - perches									
Tesselated darter	<i>Etheostoma olmstedii</i>	1 (60)	12 (34-67)		6 (32-70)	2 (32-37)	11 (30-75)	1 (70)	17 (26-87)
	<i>Total</i>	9	47	33	10	14	39	5	82+

Table 3. Previous fisheries surveys in the Mill Brook, West Tisbury Watershed.

<i>Common Name</i>	<i>Family –Family Common Name</i> <i>Scientific Name</i>	<i>Mill Brook Above Berresfords Pond</i> 10/09/2008 Norman-deau Assoc.	<i>Mill Brook Berresford s Pond</i> 10/09/2008 Norman-deau Assoc.	<i>Mill Brook Below Berresfords Pond</i> 10/09/2008 Norman-deau Assoc.	<i>Mill Brook Up from Scotchman's Road</i> 06/19/2000 MDFW	<i>Mill Brook Below Old Mill Pond</i> 06/19/2000 MDFW	<i>Mill Brook Scotchmans Road</i> 04/10/1988 MV88-20 MDFW	<i>Mill Brook South Road</i> 04/10/1988 MV88-21 MDFW	<i>Mill Pond Off Garden Club</i> 05/10/1988 MV88-32 MDFW No fish?	<i>Witch Brook North Road</i> 04/10/1988 MV88-22 MDFW	<i>Priesters Pond Upper end</i> 05/10/1988 MV88-37 MDFW	<i>Witch Brook Crocker Pond inlet</i> 05/10/1988 MV88-38 MDFW
Effort (meters)					80	65						
Effort (seconds)		327	1244	647	393	844						
<i>Petromyzontidae - lampreys</i>												
American brook lamprey	<i>Lampetra appendix</i>				5 (48-125)	1 (132)	6					
<i>Anguillidae - freshwater eels</i>												
American eel	<i>Anguilla rostrata</i>	2 (115-171)	7 (110-2110)	4 (112-610)	4 (140-220)	69 (40-300)	1	3		2		
<i>Ictaluridae - bullhead catfishes</i>												
Brown Bullhead	<i>Ameiurus nebulosus</i>					9 (64-224)				2		
<i>Esocidae - pikes</i>												
Redfin pickerel	<i>Esox americanus</i>									1		2
<i>Cyprinidae - carps and minnows</i>												
Golden shiner	<i>Notemigonus crysoleucas</i>				3 (71-85)	4 (65-92)		2				
<i>Percidae - perches</i>												
Tesselated darter	<i>Etheostoma olmsted</i>	3 (55-61)	3 (35-36)	4 (47-75)	6 (46-66)	5 (49-67)		45		8	10	
Total		5	10	8	13	88	7	50	0	13	10	2

Table . Locations of previous surveys in Mill Brook, West Tisbury in MassWildlife stream survey database.