



Striped Bass Kill at N.A.

7/22/93

Al Philips began the situation by calling Carter on Saturday to tell him there were several large striped bass in the WHTF. He stated he would also call the Game warden. Carter attempted to call you and Bob Graham on Saturday and got NO ONE.

Game warden Joe Vallesio called Ed on Saturday and told him about Kill. Ed said "he was not surprised - that striped bass were not designed for 100° water." Neither of them investigated.

On Monday we were notified by Al Philips - a Kill of about eight striped bass were observed in the second lagoon (8 to 20 lb range) large bass. Called Carter - no concern - said heat related stress - perhaps O₂ problem also. Documented habitat 'garage' from 316(a). At this time the numbers were small and the only fish involved were large striped bass. Called Ed also - he was not concerned and repeated his comment that "striped bass were not designed for 100° water."

Re-contacted Al Philips and asked for the number he was seen now - on Monday. He said he would go out and count the dead fish. Al along with Jack Berton and George O'Connell surveyed the WHTF and found 33 dead striped bass - (5 to 20 lbs) - 24 to 40 lbs old. They were located in the second lagoon around the mouth of Millpond Creek - Elk. They found no fish in the 1st lagoon and 1 or 2 in the third lagoon.

DNNA 032769

Called Denny Jones on Monday - explained situation to him and he reported the Kill to the Water Control Board at Bridgeport.

This is what has happened - I went to the WHTF on Thursday and looked around - 2nd lagoon - saw no new fish - found approx 4 old dead - very dead fish in area. All were striped bass and ranged in size from 3 lb to maybe 15 lb.



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Calls that were received -

Red - received the original call on Sat. -

On Monday - Helen Regan - Elk Creek - reported
dead striped bass -

On Tuesday - a Mr. Godwin (Windmill Point) reported
22 dead SB over weekend - 5-to 20 lb.

George O'Connell - Received a report from Jordan Island on
Monday of 80 dead SB. -

What I think - See page attached from 316(A) - I think
the bass were in this thermal refuge or deep water locate
at mouth of Mill Pond Creek - (See map also) - 55+ ft. Only large
Stripers involved - We have had 3+ weeks of very hot
weather, no rainfall, and both North Anna Units have been
operating at 90+ percent of capacity. All these combined to
raise the water temperature - stress the basses fish and
kill them.

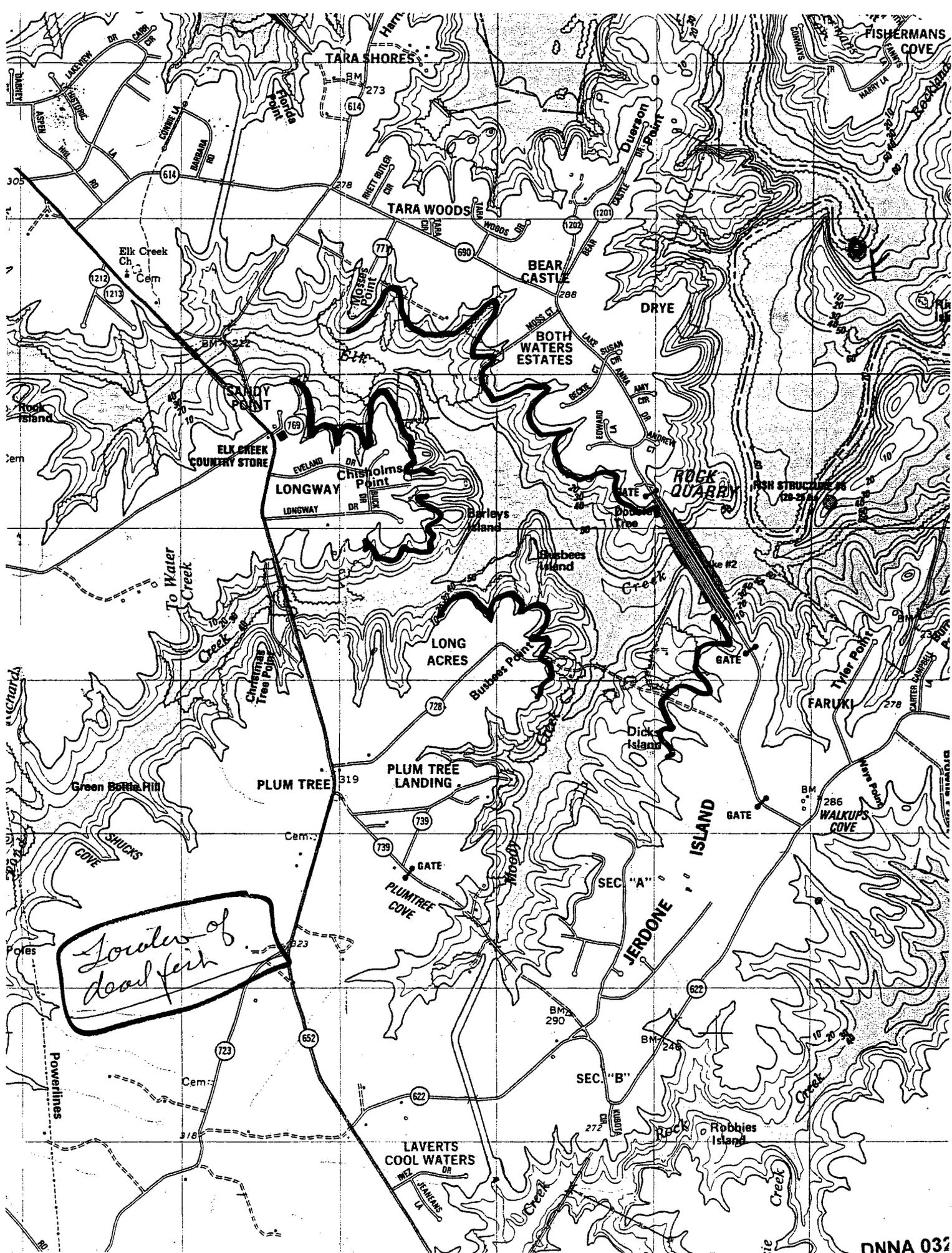
In the 316(A) section on Striped bass and thermal
limits these three factors are stated as the ^{major} influences of
stripes habitat control - Rain, Air Temp, and Station operation.
The longer the SB the less they can tolerate long exposures
to warm temperatures (Page 293 - 316(A)).

Habitat has been shown to be sub-optimal - temperature and D
in the 316(A) check for the WATF during summer months. I think
we had a long period of hot, dry, max station operation resulting
in a temperature / DO "squeeze" which resulted in the death of
the longer - less tolerant striped bass.



Other Questions you had -

- 1- There have to my knowledge or how I found any record of a fish kill this year. There have been - occur to just - large stumps that have been seen during the hot summer - both in lake and w HFF. But on this morning at once.
- 2- There is no statement in 316(A) where we say this might happen - at all - the information is there and is presented but no statement of potential fish kills is made.
- 3- We have no Temperature data for this time period other than Enders data. The instruments were changed the week before so if data is wanted we will have to change the Enders.
- 4- Yes the Procedure Manual was followed -



the boundary between the anoxic hypolimnion and the oxygenated epilimnion (12m - 13m) during July and August. Similar behavior has been reported for other southern reservoirs containing striped bass (Mathews et al. 1985) and (Lewis 1973).

The boundary layer usually has a temperature range of less than 1-2°C but can have a D.O. range of 0.0-4.0 ppm. Striped bass congregated in the Mid-Lake area of Lake Anna (Rt. 208 bridge to the Lower Lake end of Dike 2) and the area at the mouth of Millpond Creek in WHTF-2 (Appendix B-Figs. 15-38). This congregating reflects refuge seeking behavior. As striped bass follow schools of shad during the spring and early summer they eventually encounter the aforementioned temperature/D.O. "squeeze". To escape this "squeeze" they continually move to the best available refuge. The fish in the WHTF-2 - Millpond Creek area best exemplify this. These striped bass moved into Millpond Creek during the spring. As the shallower head waters warmed they were moved gradually down toward WHTF-2. By the time they reached WHTF-2 the morphometrics and temperature regimen of the canal between WHTF-2 and WHTF-3 had sealed off any migration route to WHTF-3 and the lower lake. The canal is stepped in such a way that it effectively pools the deeper, cooler water in WHTF-2 and skims the warmer surface waters off into WHTF-3.

The tracking data confirms the importance of cool summer rains and the opportunity they provide for increased movement out of the best available refuges and through the

Table 4.4-9 Comparison of temperature -dissolved oxygen profiles before and after a period of precipitation (13.6cm from 8/18-8/19)

W H T F -2 - Millpond Creek Area

	<u>8/14/1985</u>			<u>8/19/1985</u>	
	<u>Depth</u> (m)	<u>Temp.</u> (°C)	<u>D.O.</u> (ppm)	<u>Temp.</u> (°C)	<u>D.O.</u> (ppm)
	Surface	33.4	7.0	30.0	6.1
	1.0	32.6	7.1	30.0	6.1
	2.0	32.0	7.2	29.9	6.6
	3.0	31.9	7.1	29.9	6.5
	4.0	31.5	7.0	29.7	6.5
	5.0	31.4	6.8	29.4	6.5
	6.0	30.6	6.8	29.3	6.5
	7.0	29.2	5.9	29.2	6.1
	8.0	29.0	5.5	29.1	6.1
	9.0	28.7	4.5	29.0	5.7
	10.0	28.5	4.3	28.7	5.0
	11.0	28.3	4.1	28.5	4.9
D.O. Limit Before Rain →	11.5	28.1	3.4		
	12.0	27.6	1.2	28.3	4.7
	12.5	27.3	0.2		
	13.0	26.3	0.2	27.6	4.0
D.O. Limit After Rain →	13.5	25.6	0.2	26.6	3.7
	14.0	24.2	0.2	26.4	0.3
	15.0	22.6	0.2	22.2	0.0
	16.0	21.8	0.2	22.2	0.0

	<u>8/18/1985</u>	<u>8/19/1985</u>
Average Air Temperature	70.1°F	75.1°F
Minimum Air Temperature	68.2°F	67.0°F