NORTH BRANFORD - CONSERVATION

000901

ANATOMY OF A DYING POND

(ATTACHMENT TO NORTH BRANFORD [illegible])

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INTRODUCTION

The conservation study which was undertaken by myself and approximately fifteen of my students started out as a project to analyze the school campus and make careful comparisons as to the ecological significance of each area. One such area which is located at the east side of the school between the building and the baseball field is a pond. Just to the north of this pond lies a fairly dense wooded area with a small brook running from a black topped parking lot to the pond. It was here that our study started and it was here that it ended. We discovered this area to be so overly rich in ecological conservational lessons that we abandonded our original plan to study the entire campus and instead concentrated out efforts on this one area.

The area covers approximately two acres of land and is generally left to nature by the school population. This affords a great opportunity for a naturalist to see nature at its best in its own surroundings. To a person not aquainted with the area a question of value arrises. What is this piece of land doing here? What purpose does it serve? Why aren't the trees removed and the area put to good use? These and more like them are some of the questions which I get and anyone would get at first impression of the land. To a practicing conservationist the anserrs are simple; to someone like me the questions are not easily answered; and to those who ask out of ignorance there are no answers.

BACKGROUND OF AREA

The North Branford High School which lies between Route 80, Mill Road, Route 22, and Caputo Road was completed in 1963. At this time plans were made for an extension of the building to produce a Y shaped building when the addition was completed. This was started and completed in 1967. The addition ran to the South end of the school and bordered the pond to the east.

To partially provide a base for the building much fill was used for the area around the school shows evidence of this. To construct the blacktop parking area which was to be between two high level ridges the use of fill also played a role. Our study area was left intact for a purpose. Mr. Gene F. Marra Principal of the High School wanted this feelling that the area could be put to use for a purpose such as a nature study area at some later time. The area to the north of the running brook also contains a lowland marsh environment much like our study area. Evidence shows that when the blacktopped area was filled in a large drain pipe was laid connecting the North marsh area with our study area. (See map inserts.)

GENERALIZED STUDY OF AREA

In order to gain full knowledge of the ecological significance of our study area the students and I took several long observational walks around, through, and in some cases into the land. The more we looked the more we realized how much there was to observe, catagorize, and study. The area is so complex that we decided to make observation stations showing what we could as a beginning. The next step in our planned operation will be discussed in a later section of this paper.

I think that the one thing all realized at the time was the fact that our pond was no ordinary pond. We discovered that through observation and reasoned deduction our pond was and still is actually dying. We feel that over the period of several years through man's influence the pond has continually dried up and will continue to dry up until such time as there is none left.

What is to follow is a study of the generalized area in the form of a station observation breakdown. It was hoped that each station could bring together some general knowledge of the entire area since it all has a basic significance with what happens to our nature area.

STATION #1-BLACKTOP DRAIN

This station shows some definite evidence as to the development of the land and man's influence on it. The drainpipe that you see is buried in the ground. As you can also see it is covered with blacktop. Was this always as high in elevation as it is now? How can you tell? Where is the drain going or coming from? Look across the blacktop to the other side. What is there? How does it compare with this area? Do you see any evidence that this area and that were originally the same? What therefore is the purpose of the drain connection? Is it serving its purpose?

The area to the front of the drain shows some significant things also. Notice the bubbling churning sand and water. This is a small underground spring, these are prevalent here at this time of year when the water underground tends to surface. They gradually disappear as summer comes. Why ? By looking at the water you can tell there is a definite current. How can you tell? Because of the current only special vegetation can stay rooted. What does this tell about the root systems of the plants in the water? Along the banks of the stream other vegetation is shown. What trees or saplings do you see. What do you know about these trees?

STATION #2 BASIN OUTSIDE EXIT 4

This station shows further evidence of man's influence on the area. Why is this drain here? What is it draining? Notice how the area has been built up to lay the foundation for the school. Here is a fact which may surprise you. The school basement is actually below the water table of this area. Evidence of this lies in the fact that whenever a heavy spring rain occurs the basement becomes flooded. The area was not built up enough to allow drainage. Notice the small stream. How does it compare with the stream at station #1? What do you see on top of the water? Did you notice this in station 1? Why not? What evidence of tree life do you see here? Can you identify the trees? Identify the leaf structures and branching for each tree. How many trees have alternate branching and how many have opposite?

Notice the ground vegetation in this area. Is this considered to be a swamp? What constitutes a swamp? How is this different? Is the brook you see here natural or man made? How can you tell? What purpose does it serve? Notice the skunk cabbages which are prevalent in the area. What do you know about the skunk cabbage? How does this relate to the area in general?

STATION #3 WOODED AREA

This station shows the predominance of a larger type vegetation. What is the predominant vegetation of this area? Look at the large sugar maple. How old would you say this tree is? How does the sugar maple relate to the general environment? If this tree is more than 50 years old what does this tell you about the area 50 years ago? Notice the skunk cabbage growth here. How does this relate to the area in station # 2?

STATION #4 ENTRANCE OF STREAM TO POND

Here is a very interesting ecological situation. Notice how the stream which is considerably wider at this point shows clarity and definite movement. Notice how the movement seems to cease when the stream water enters the pond. Vegetation in the stream bed again must be deep rooted to hold fast and allow for general growth. The banks of the stream are very soft and boggy. Why? What type of ground vegetation do you see growing? Taking into consideration all the effects of the environment what will this bank bog become in a few years? Why? Do you see any trees here? Notice the Red Maple branches growing here? Why did this grow to this pattern? Do you think seed dispersal had anything to do with the pattern of growth? Will this tree survive and grow to any considerable size? What final effect will it have on the general area?

Looking out over the pond from this angle you can get a general idea of the conditions out in the pond area. Would you say the water is deep? Why not? What evidence do you have or can you see to support your answers? Do you see any evidence of animal life here? How about

the bird life in the area? Evidence shows at least 6 species of birds living in this immediate area. That crying sound is that of the Tern. The Tern lives in the swamp area building the nest in the grass above the water. The female is a curious specimen. If you could approach the well hidden nest when she is perched on the eggs she will immediately fly away from it and try to draw your attention from the nest by pretending she has a broken wing. She is quite an actress. Other bird life in the area include the Red-Winged Blackbird, a typical marsh bird, swallows, blackbirds, and even a family of what we believe to be Mallard Ducks.

As the water is drained into the pond it is in the process of stagnating. Evidence of drying is also shown with the vegetation growth. Notice the isolated pockets of water. Were these always here? What evidence is there that the water level had dropped? In each isolated pocket you can see other evidence of stagnation. What is it? Do you see the scum on top of the water? What type of Algae growth is shown? Analysis shows great amounts of spirogyra growing here. This is a green alga prevalent in the spring and fall months. During sunny days photosynthesis takes place rapidly and oxygen is produced causing the plant to rise. Floating colonies of spirogyra are seen during the daytime.

STATION #5 POND BANK

This is another interesting station showing more evidence of the changing environment. What new vegetative growth do you see here? What type of plant is a cattail? The cattail is a monocot. What does this mean? How do thay differ from dicots? Both belong to the phylum Spermatophyta. The cattail belongs to the class Angiospermae. The cattail is a flowering plant. Notice where the seeds are produced. What type of dispersal is shown. What other plant can you show which has this same type dispersal?

Notice how the land shows a definite pitch to the pond. The grass growing around the cattails is typical marsh grass. Now look to where the water is and see if you can see similar vegetation. Notice how the grass grows beneath the water surface. Is it similar to the marsh grass located to the left? How does this show that the water level was different many years ago. Do you see a pattern emerging? How will this area look in the future? Notice how the outgrowth has taken place in several spots pushing the grass upward creating pockets of grass. These are commonly known as "Mummy heads" and are excellent places for animal invasion and survival. What animals would you expect to see living in these structures.

STATION # 6 ALDER BUSH

This station shows again the edge of the pond and its relationship to the immediate surroundings. The small branching tree on the bank is an Alder Bush. Notice the cone like growths on the branches. What type branching is shown? How does it compare with the other types you have seen? Look out over the pond. Do you notice how the water has gradually disappeared from here? Look at the evidence of bird life mentioned in previous sections. It is out on these low moist flatlands that the Tern and other birds will nest. Listen for birdcalls and see if you can identify any songs.

Now look over at the high bank of the pond. Notice the digging which has gone on here. What animal is living here? Notice the number of holes. Estimate how many animals you think are here. What do you see in the digging? Can you see which hole is the entrance and which the exit? The Woodchuck is a burrowing animal living in a series of underground tunnels. This and other evidence should be apparent to all that this land is of definite value.

STATION # 7-DRAIN AT SOUTH END

The drain you see here is taking the water running from the pond and carrying it underground across the Junior High School field to Rt. 80. It empties into the small stream on the other side of Route 80. What type of seedling is growing here? The weeping willow is an excellent moist area plant because it is so thirsty. It is also a rapid grower. Notice the branches of the seedling. What does this tell you about the way the tree was germinated? This is one evidence of how nature tends to change things from wet to dry and dry to wet. The weeping willow will absorb more and more moisture as it gets larger and larger.

Notice the current in the water as it enters the drain. It is much quicker than the almost stagnated condition seen in other parts of the pond. Since the water is moving so rapidly here it should suggest something about the level of this area compared to other areas of the pond. What is it? Do you see any evidence of vegetation such as seen in previous stations? Why is this area so different?

STATION # 8-CEMENT CASING DRAIN

Look down here at the curious separation of the earth. What do you think caused this? Do you see that it could not have been caused by an animal? It is possible that this separation was the work of a surface stream running into the pond. The main vegetation here is grass. It is extremely high and thick. The soil has a definite richness allowing such thick growth.

Look out over the pond again. Here is more of the swamp grass growth both under and above the water. Cattails are also in evidence here. In this case the Cattail may be a climax plant. What does this mean?

The reed growth in this area also shows some interesting things. The area is prevalent with plant galls. What is a gall? How is it produced? What produces it? What is the interaction between plant and animal in the story of the gall. The plant gall has a biological significance. It was in the 18th. century that Francesco Redi observed and and recorded his interpretations of the gall. He used this observation of the gall in his theory an the spontaneous creation of life. He was wrong. Read his story and find out why.

STATION # 9 BANK ACROSS FROM SCHOOL

Notice the difference in the water here as compared to where we just left . The water here shows stagnation and a curious red color What is this red color? How did it get here? The water shows much evidence of algal life and probably protozoan life also. What kinds of protozoan life would you expect here? Look over at the wooded area just to our right. Do you see the red color there? How is the water similar to this?

The wooded area is a curious combination of several things . At the front edge you can see great indications of another moist tree growth called sumac. What kind of sumac is this? Notice the branching from the central main branch which occurs at the top. This is called stag-horn sumac. Do you see how it gets its name? During the winter and early spring the branching is very evident. The other tree growths in this wooded area are unusual. You can see at least 2 Dogwood trees here. Which are they? Spring and Dogwoods are great companions. Other trees here are elms, oaks and maples. Are all these trees considered to be typical of moist areas? What does this suggest about how the area is changing? What do you think it looked like before?

STATION # 10 WOODED AREA

Standing here in the thickly wooded area you can see several interesting patterns. Notice the largeness of the oaks and elms. These are very old trees. It should be clear to you that this entire area is and was heavily wooded for many years. Look down at the old barbed wire fence and the empty rusting trash barrels. What connection do these have with the area of water we just left?

Here you can see excellent areas of skunk-cabbage growth as well as "mummy heads" which we were introduced to before. This time however you can actually see and touch them because of the drier conditions here. Notice the small white flowers growing here. What are they? They are extremely abundant in this area as are violets and buttercups. The white flower is called a bloodroot. If you remove the flower by the root it takes on a pale red color. The area here shows abundant growth of wild rose bushes. You can all recognize them by the vine like brush growth with the rose thorns. How often do these blossom?

DRAWING CONCLUSIONS

I think what we have tried to bring out in this paper is certainly not anything in the way of a finished product. The project is just beginning. We have continued our work much beyond just simple observations We have tried to analyze, converse, and draw conclusions as much as possible. These conclusions and observations were brought out as much as possible in the text of the paper. The paper draws conclusions but does not try to lead the students to fit into a pattern. Much room is left for the teacher to lead or try to lead the student to draw their own conclusions. Many of the questions are asked and then answered immediately after. The teacher has the option to leave the answer for the students or answer the question himself. In the later it would be wise for the teacher to illustrate the answer using the surroundings. The teacher is not bound to this study or its approach at all. The topics illustrated here are merely suggestive. The teacher may use these questions or any of their own. The teacher may use this as a guide but is by no means tied to this approach.

FUTURE PLANS FOR THE AREA

Being that the area is in such a natural state and so rich in its ecological significance, it would be wise to use the area as much as possible for general observation and use. Several different possibilities arise for the study of this area. I would like to illustrate or explain a few possibilities which could be undertaken by myself.

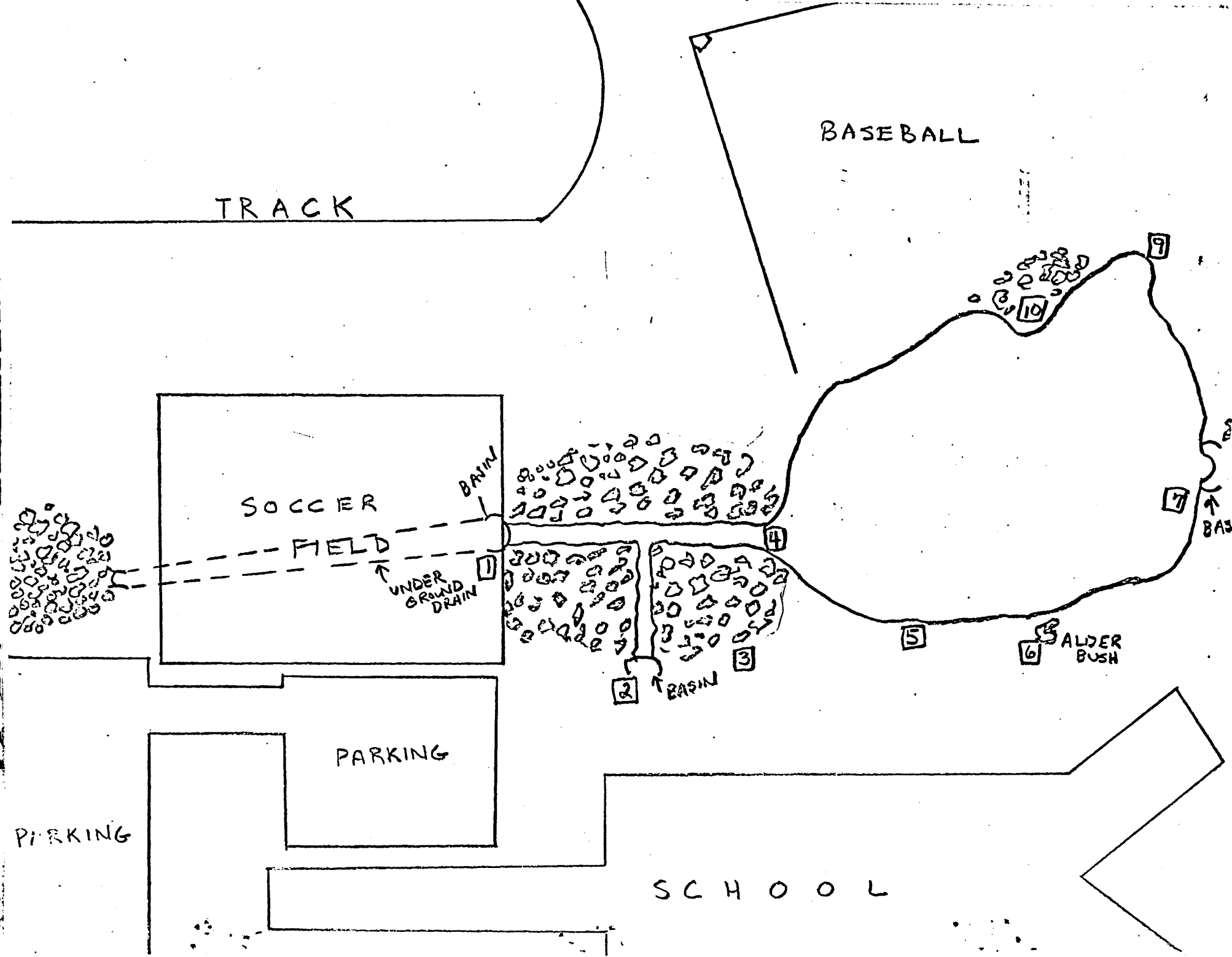
A) Since the area contains a pond, a running brook, and a wooded area the first temptation is to allow nature to proceed at her own pace and leave the area to be observed as it changes. I personally like this approach. The pond is dying. It affords everyone the opportunity to see exactly what it looks like now and what it will look like in the future. The area is changing. Ask yourself: What will it look like a year or 5 years from now? What will happen to the wildlife living here when the pond dies? How will the animal life be altered? How will the vegetation change? Will man's influence on the area speed up or slow down the change? This is one possibility for a study project of the future. Along with this of course would be the study of the area in a natural state at different seasons of the year. How does the area differ in winter and in spring or how does it differ in fall and summer? The realm of possibilities existing here are endless with the comparative workup of the area in each seasonal change.

B) A second possibility is to make use of the natural areas given us in an intense study of the many aspects of the ecology. Examples co could be: Water analysis of different areas of the pond and brook, classification and catagorizing of the life of the Protozoology of the pond and the collection and study of its algal life. Soil testing can be done with samples taken from the heavy woodland and compared to

soil of the pond bank. Complete workups can be done as to alkalinity and acidity tests, mineral content, soil temperature, and type of vegetational ecology. Classification of trees and saplings of the area including the background of the trees found here. Leaf collections, seed collections, branchings and bark identification, and the relationship of the tree vegetation to the area as a whole could be done. The study of the wildlife of the area would be another possibility including the animals mentioned in the text as well as those present here which do not make their presence so obvious. Another possibility is a complete grouping and classification of the wild flowers, and plants of the area including mosses, ferns, liverworts, lichens, shrubs, vascular plants and flowering plants.

In this suggestion I think the students could be taught the significance of the area so quickly that questions such as were asked at the beginning of this paper would have so much more value to them.

As for my own opinion I would like to try a combination of both approaches. Students using the area should be briefed on the balance of nature and the significance of not disturbing it. They, I believe, also should be aware of the uses the area affords such as explained in Suggestion B.


TRACK
BASEBALL
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1
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PARKING
PARKING
SCHOOL