YELLOW PICKEREL SPAWNING BED IMPROVEMENTS
AT PORT SEVERN AND WHITE'S FALLS - 1979

~~A large portion of the SPOF funds made available to Huronia District in 1979 were used to improve the~~ Yellow pickerel spawning grounds at Port Severn and White's Falls were improved using S.P.O.F. funds (Strategic plan for Ontario Fisheries) in the Huronia District in 1979. Since ~~entirely~~ different management techniques were used, each spawning ground improvement they will be reported separately.

PORT SEVERN

This spawning ground is located below and adjacent to Island K in Tug Channel of Georgian Bay near the last lock in the Trent Severn Waterway. An investigation done by Townes, ~~reported in 1975~~ (1975), showed the spawning area to be deficient in egg holding capacity. It was decided improvement to the site was required. However, funds were not available so the idea was placed on a priority list for future action. Research into spawning ground improvements failed to locate any reference to major improvements to yellow pickerel spawning grounds. However, several small experimental projects had proved successful. The literature showed that large scale improvements have been very successful with Salmonids.

In the spring of 1979 it appeared that SPOF funds might become available. We contacted all concerned ministries (both Provincial and Federal) and the one adjacent property with our general proposals and the necessary approvals obtained. A proposed plan to improve 2800 square meters (approx. 30,000 square feet) ~~in areas A4 and A6~~ was prepared and approved by District office by mid-July. This plan called for stock piling the material along both shores then slinging it into place by dragline. The amount of rock required was estimated at 3,000 tons. Funds were received in August and tenders called for the supply of 4,500 tons of gabian size rock ranging in size from 32 cm (5") to 130 cm (20"), ~~since any~~ excess rock could be utilized at White's Falls. Tenders were received for granite (field stone) and quarried limestone. The tender was for quarried limestone. After some discussion regarding changing the existing granite substrate to one basically limestone

and the fear of inhibiting factors ~~on nearby~~ in newly quarried material the lowest tender was accepted. Tendering for equipment rental revealed that equipment could be rented as cheaply from the supplier of the stone as from anyone else. As a result, we used their equipment, thereby relieving us of the responsibility of trying to schedule equipment as required.

During an ~~on~~ site inspection with a representative of the contractor it was decided to place all material into a ~~[illegible]~~ roadway or causeway across the entire area. It was apparent that this would allow us to treat a much larger area than originally planned ~~for a very small expenditure~~. On October 8, we commenced hauling with a fleet of seven trucks and in three and one half days had completed the causeway with three arms and 4,100 tons of material. The construction was relatively simple. The trucks would back out to the end of the causeway, dump their load, and when the material built up, a bulldozer would push it over and level it.

With the material in place, a dragline with a 60' boom was brought in and it ~~commenced~~ spreading the material from the outer end of the causeway. The instructions were to have the bottom rough to provide leave resting places for the spawning fish. An additional 90 tons of large boulders were spread randomly for the same purpose. The spreading took less than three days, leaving us with a very good egg holding area and a very little cleanup.

Our original plan was to increase the spawning area by approximately 2,800 square meters (30,000 square feet). However, by changing our methods we increased the area to approximately 4,650 square meters (50,000 square feet). The causeway method allowed the extra 1,860 square meters (20,000 square feet) to be constructed for an additional ~~estimated~~ cost of less than $2,000 which is less than the cost of the material used.) Because placement and spreading of the material was faster and easier, there was little expensive equipment waiting time and the cleanup and repair of lawn damage only took a small portion of the expected time (16 man hours).

When all of the logs were taken out of the spillway in the spring of 1980, we were pleased to discover a nice even ~~floor~~ flow over the entire spawning grounds. Gone was the whirlpool in area A6 and the heavy flow through A5 and A4.

need maps or eliminate

We then waited, not without some apprehension, for the 1980 spawning run to start. We anticipated a reduction in the numbers of fish utilizing the bed for a year or two because of its newness, etcetera. However, our fears were groundless. The fish arrived and took to the new bed without hesitation. In fact, no fish were observed spawning in areas of poorer egg holding capacity which in past years had been used quite heavily. Fish were observed resting and actively spawning throughout the entire treated area. Some of the heaviest concentrations were in areas where the heavy current previously made it impossible for the fish to remain in. Observations made during the 1981 spawning run confirmed those of 1980. Examination of the substrate disclosed eggs in various stages of development scattered throughout. With the large increase in egg holding capability, we are confident annual recruitment for the fishery will increase substantially.

WHITE'S FALLS

~~The major problem at~~ White's Falls ~~which~~ is located on Gloucester Pool upstream from Georgian Bay was the extremely heavy water flow averaging 4,000 cu.ft./sec. during the spring runoff. This heavy flow prevented the fish from utilizing some of the best available substrate.

The preliminary work (approvals, etc.) for here was done in conjunction with Port Severn. However, there was one important addition. When the dam was built in the early 1900's a large amount of waste rock was produced and was picked up and left at the site. The Trent Severn Waterway was kind enough to allow us to use this material for our project.

The plan of action here was to build an island to divert the current and allow the spawning fish access to the better substrate.

The 400 tons of Gabian stone left over from Port Severn had been stock piled here and some of it was used to build a causeway to where the island was to start. A front end loader with a four yard bucket was used to transport the material from the pile and place it where required. A high hoe was used to sort the pile and load this machine. After a base of approximately (40'x40') was in place the remainder of the Gabian stone was cast in the lee of the island to provide more egg holding capacity.

The island was then built up to approximately 2m (8') above the water surface using the heaviest possible material on the upstream side. The causeway was then dug out and cast downstream for the spring currents, hopefully, to wash into the lee of the island.

The spring of 1980 saw an extremely heavy flow of water and despite some of the boulders being all the large front end loader could handle, some were moved downstream, thereby decreasing the size of the island. However, enough remained in place to do most of what it was designed for. Because of the high water flows on both sides of the island, no observations of the fish were made but we are confident the mid 1980's will seean increase in recruitment to this fish population.

It is recommended that as soon as funds become available consideration be given to placing more suitable substrate below the island to further increase the egg holding potential.

Total costs for material, equipment rental, and manpower in these projects was slightly less than $24,500 with approximately $5,000 of this amount being the cost of the island.

ACKNOWLEDGEMENTS

I wish to express my appreciation to my supervisor, Alex Smith, and the rest of the District staff for their support. I know that if someone told me they wanted to build an island my approval wouldn't be almost immediate.

PORT SEVERN

PICKEREL SPAWNING GROUND INVESTIGATION

by
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Huronia District

ABSTRACT

This investigation was undertaken to collect information on the very important Port Severn pickerel spawning grounds. The spawning areas were mapped and photographed. Suggestions are made on the possible construction of artificial beds.

INTRODUCTION

Port Severn is located at the Georgian Bay end of the Trent-Severn waterway. The main spawning beds are located adjacent to the small spillway just north of the Port Severn locks (Map I).

The site is always covered with water and there is a swift current. The water is dark enough to preclude surface observations of the actual spawning beds. As a result, the investigation involved the use of diving gear and underwater cameras.

METHOD AND RESULTS

The project started during the summer of 1973 and was completed in the summers of 1974 and 1975.

The first dive was a real "eye opener". The areas of good egg holding capacity were very much smaller than expected. Surface estimates of 140,000 square feet of spawning area

proved inaccurate when underwater observation indicated only 10,000 square feet of the area actually had good egg holding material. The remainder of the area consisted of sand, bedrock, and clay.

A detailed map of the bottom types was drawn (Map II). This was a time consuming exercise hampered by the swift current and the lack of landmarks. However, we feel the map is reasonably accurate. A number of photographs were taken representing the various bottom types (Appendix I).

As discussed earlier, only a small percentage of what we had considered as spawning area actually is suitable for spawning.

Area A-8 (Map II) is interesting as it consists of waste that was dumped during the construction of the present locks. The high water levels of the past few years have covered the area and apparently provides an additional egg holding area. While observations have shown pickerel spawning in area A-1 we have few observations of pickerel on area A-8. Nevertheless, it does appear to have good egg holding capacity.

During the diving the following species were observed; American eel, silver lamprey, sea lamprey, rainbow trout, yellow pickerel, northern pike, gar, pike, pumpkinseed, rock bass, perch, log perch, small mouth bass, large mouth bass, carp, spottail shiners, map turtle and painted turtle.

DISCUSSION

The Port Severn spawning beds are much smaller than we had previously thought. Any development, digging, etc., in the area will have to be carefully controlled and directed to maintain the beds. Recent rumors about construction of additional locks or marine railways at Port Severn could pose a serious threat to our pickerel fishery. Indications are that a good percentage of the Matchedash Sound pickerel fishery is being supported by this spawning population. Knowledge of the spawning areas is necessary before a case can be made to protect them.

If the construction should take place, there is the possibility that we could increase the size of the spawning area by utilizing construction materials to create artificial spawning beds. The interesting situation in area A-8 (Map II) might be repeated in other areas. We suggest area A-9 (Map II) might be an area to consider for a spawning bed. Map III indicates the location of a proposed bed. The area is an average nine feet deep and approximately 22,000 square feet in area. Filling the area with five feet of good spawning material would provide water levels of four feet over the bed. We estimate the amount of material to be used would be approximately 4,000 cubic yards.

A great deal of thought and study would be necessary to insure acceptance by spawning fish. The material would

have to be heavy enough to prevent being washed away in the swift current when the dam is open. Freshly quarried rock might have some inhibiting factor which may take some years to wash away. Ideally, material already underwater and removed by any new development would be used for a spawning bed.

RECOMMENDATIONS

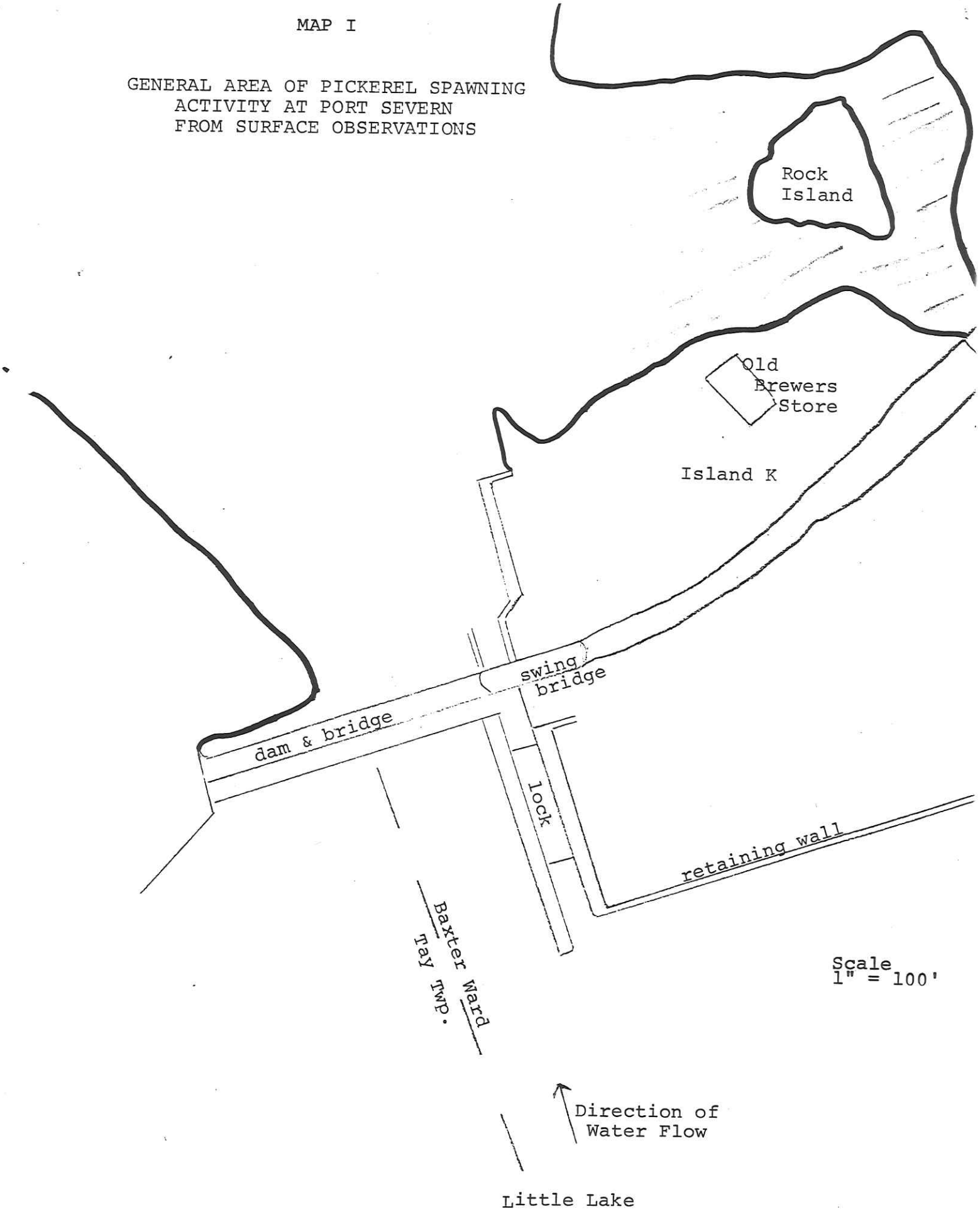
It is recommended that close liaison be maintained with Trent Canal personnel to ensure we are aware of any project which might affect this area. It is recommended that projects similar to this one be conducted on all our known spawning areas so we know exactly what we have and where it is.

ACKNOWLEDGEMENTS

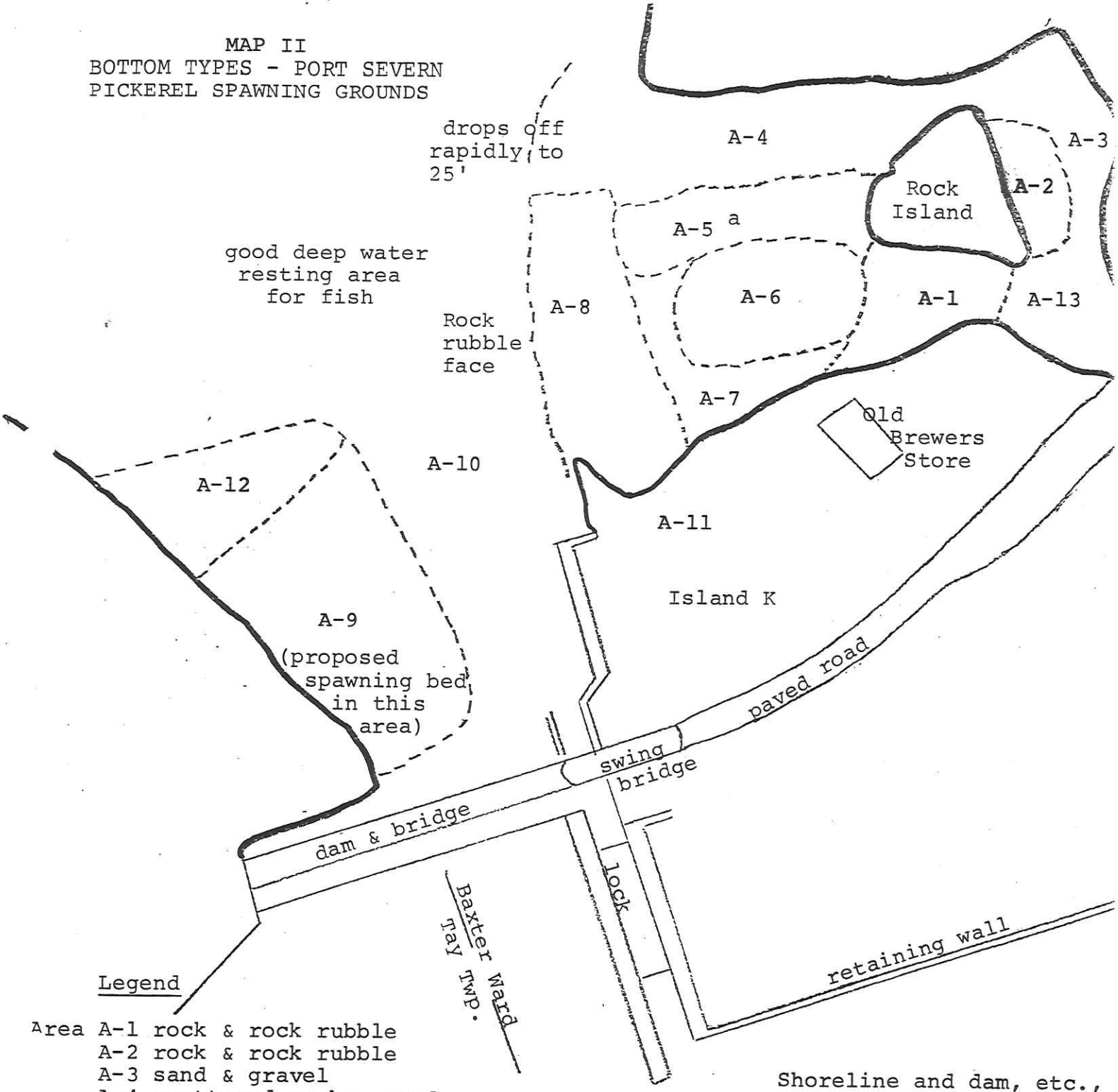
I wish to thank all those who assisted me in this project, particularily Fish and Wildlife Supervisor A. J. Stewart, who encouraged and backed this project. Special thanks to Mont Richardson who dove with me and assisted with the photography.

MAP I

GENERAL AREA OF PICKEREL SPAWNING
ACTIVITY AT PORT SEVERN
FROM SURFACE OBSERVATIONS



MAP II
BOTTOM TYPES - PORT SEVERN
PICKEREL SPAWNING GROUNDS



Legend

Area A-1 rock & rock rubble
A-2 rock & rock rubble
A-3 sand & gravel
A-4 scattered rocks, sand, bedrock and small patches of rock & rubble
A-5 solid bedrock
A-6 sand bottom
A-7 clay & gravel, scattered rock
A-8 rock rubble fill, some slabs on top
A-9 bedrock with large boulders well scattered
A-10 sand & bedrock
A-11 Trent Canal property
A-12 bedrock shoal
A-13 mostly solid rock

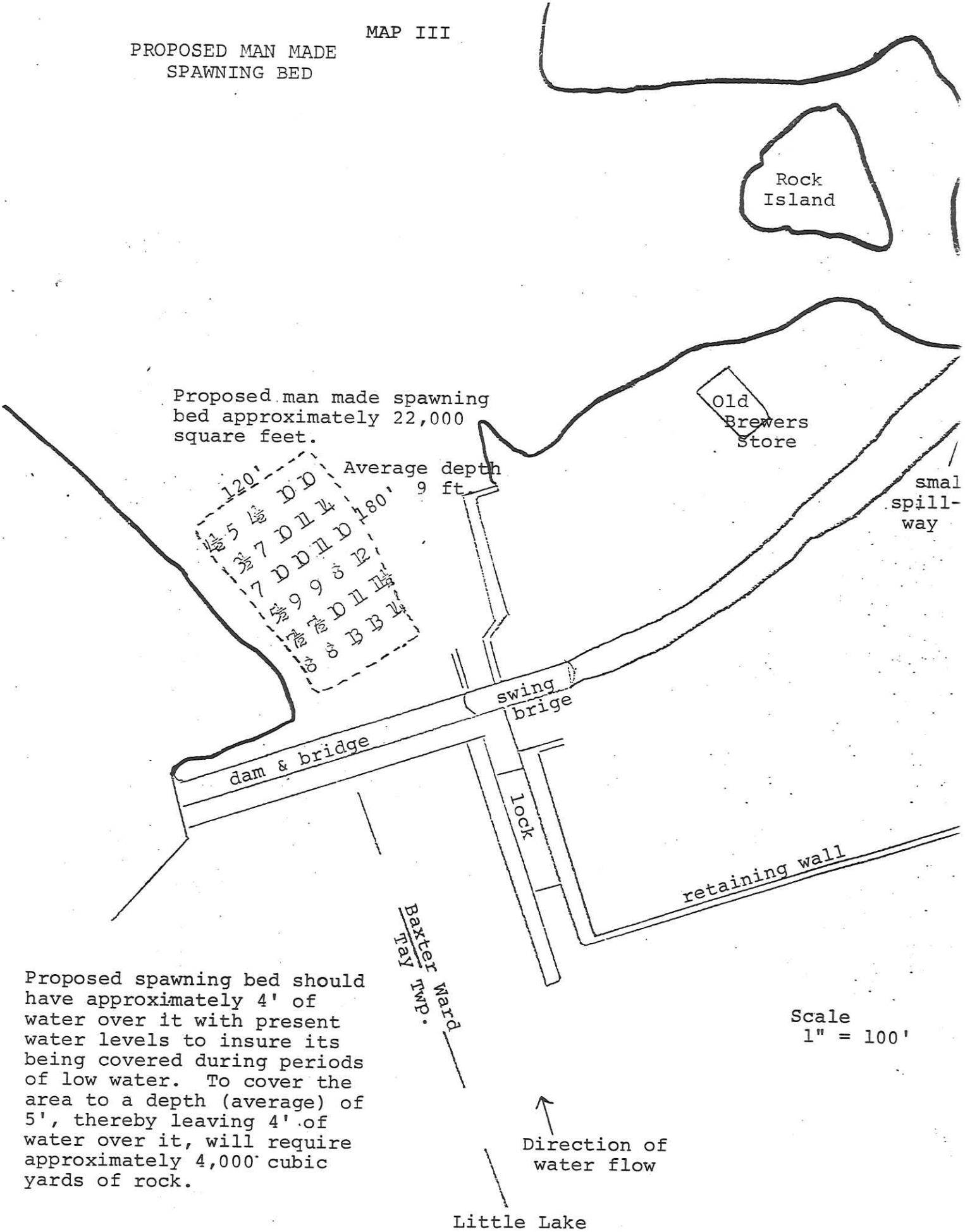
Shoreline and dam, etc., to scale from D.H.O. map
Scale
1" = 100'

Direction of water flow

Little Lake

MAP III

PROPOSED MAN MADE
SPAWNING BED

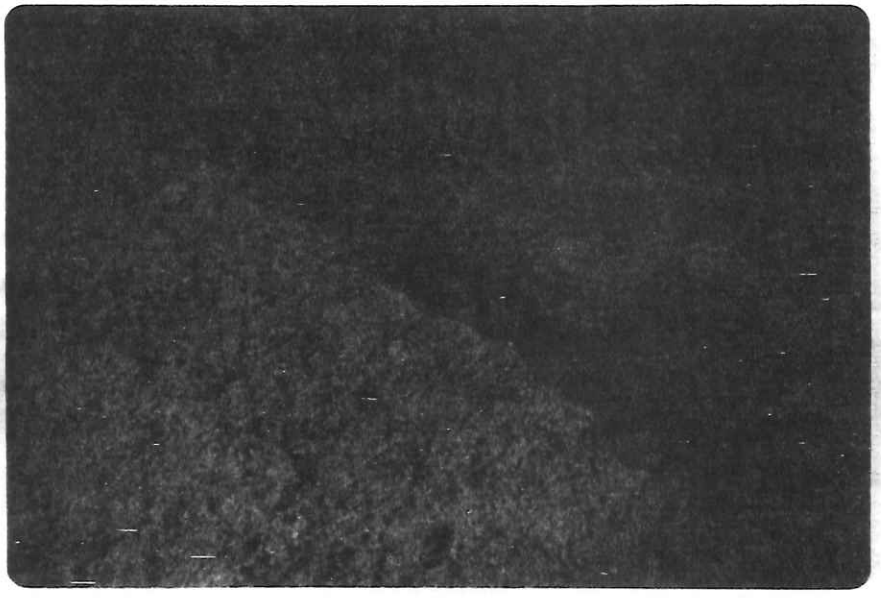


Proposed spawning bed should have approximately 4' of water over it with present water levels to insure its being covered during periods of low water. To cover the area to a depth (average) of 5', thereby leaving 4' of water over it, will require approximately 4,000 cubic yards of rock.

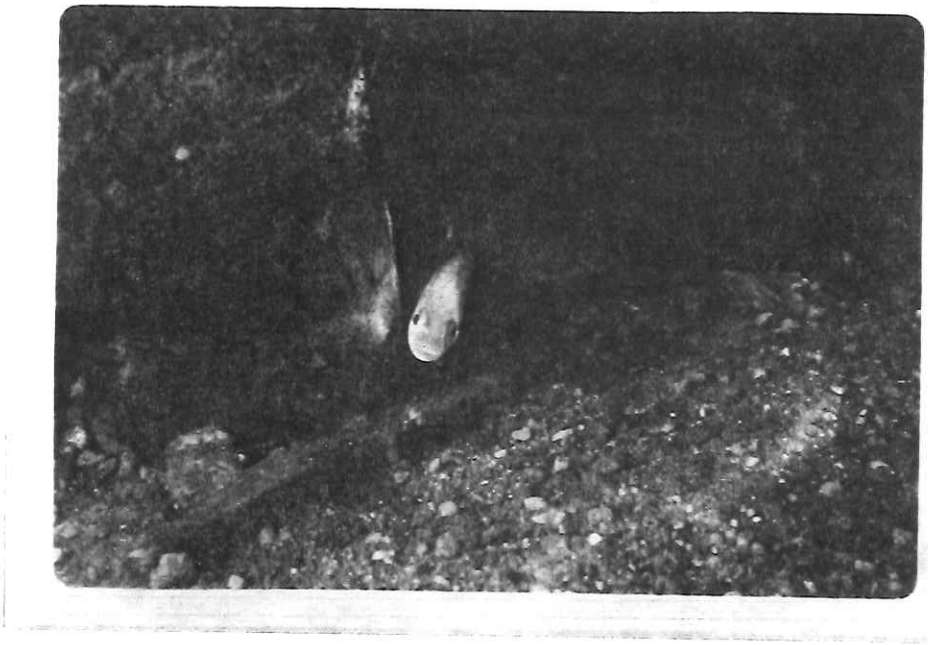
Scale
1" = 100'



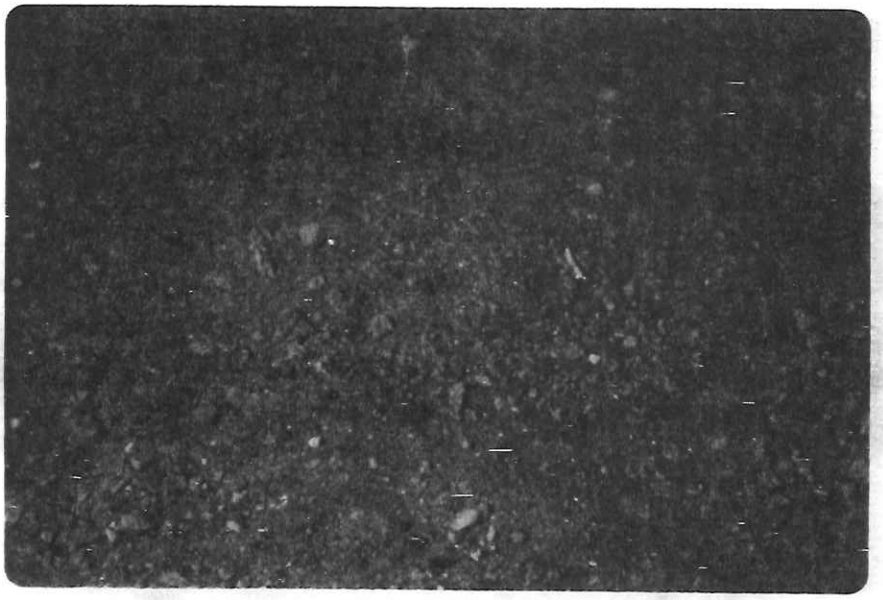
Area A-3 - Note fine sand.
Some similar material in A-4.



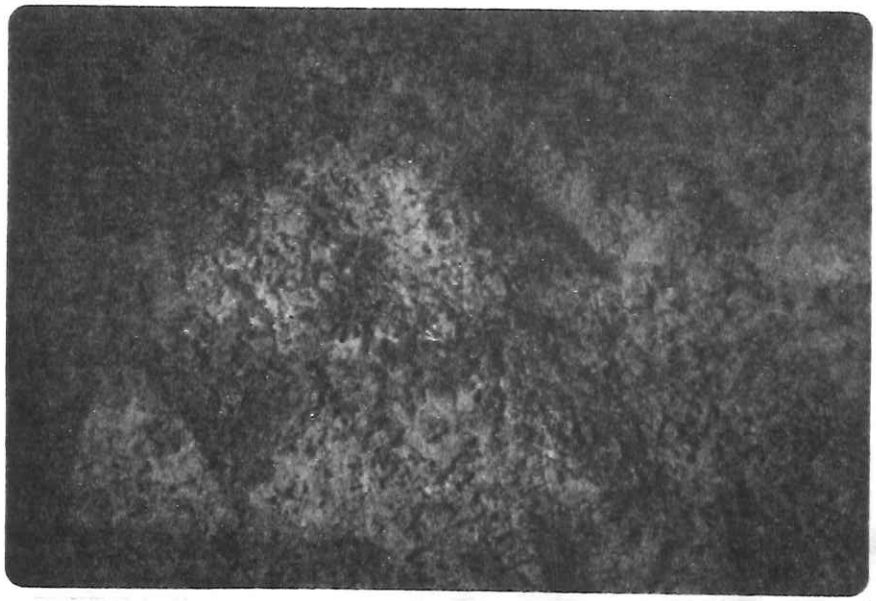
Area A-5 - Bedrock showing one fracture.



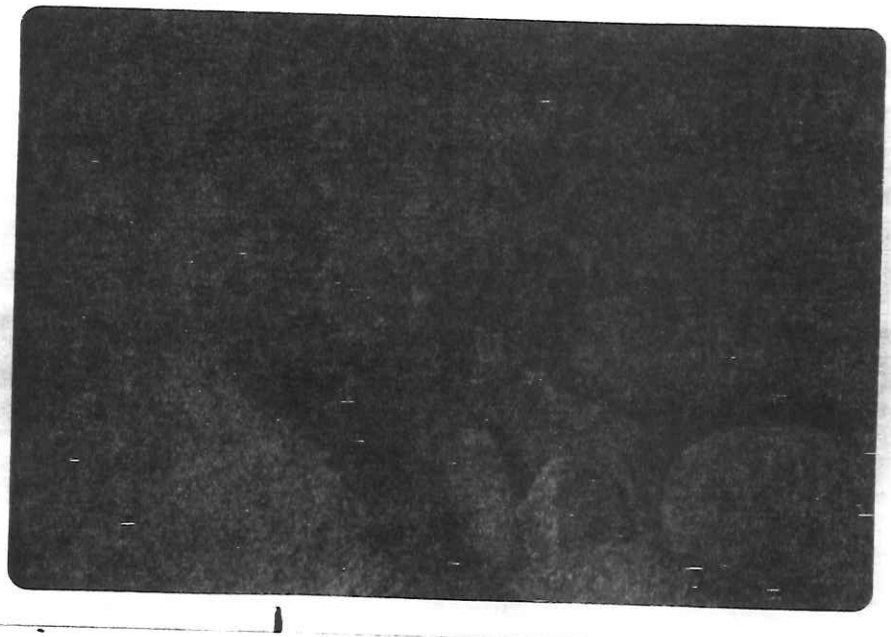
Joining of A-1 and A-6.
Note abrupt change.



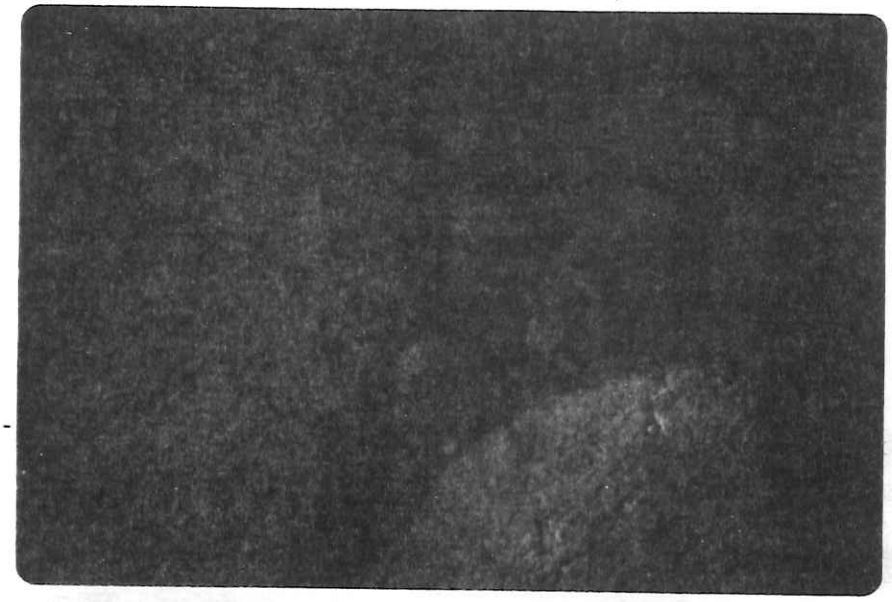
Area A-6 - Note slightly large material
than A-3.



Area A-7 - Clay. At first glance appears to be weathered limestone.



Area A-1 - Good egg holding area.



Area A-1 - Good egg holding capacity.



Area A-2 - Note smaller material than in A-1.
Currents move sand around cleaning stones.
Effect on eggs?