

MANAGEMENT PLAN FOR TABLE POINT ECOLOGICAL RESERVE



Parks and Natural Areas Division
Department of Environment & Conservation
Government of Newfoundland & Labrador
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1.01 TABLE POINT ECOLOGICAL RESERVE GEOLOGY AND PALEONTOLOGY INTRODUCTION

1.1 Location and Importance

Table Point is a minor headland located about 14 km northeast of the community of Daniel's Harbour on the Great Northern Peninsula of western Newfoundland (Figure 1). The site contains an unusual Early Ordovician graptolite horizon preserved in dolostone as well as one of the most diverse and well preserved assemblages of Middle Ordovician fossils in the world.

Interesting diagenetic alteration of the uppermost beds of the Catoche Formation of the St. George Group may also be observed within the reserve. The site also contains the formation stratotypes (i.e. type sections) for the Aguathuna Formation of the St. George Group and the Table Point and Table Cove Formations of the Table Head Group.

1.2 Regional Geology

The Port au Port and Great Northern Peninsulas of Western Newfoundland form part of the Humber Zone, one of the four major tectonostratigraphic subdivisions of the Appalachian Orogen in Newfoundland (Figure 2).

The geology of Western Newfoundland (Figure 3) records the opening, closing, subsequent infilling and uplift of the Early Paleozoic Iapetus

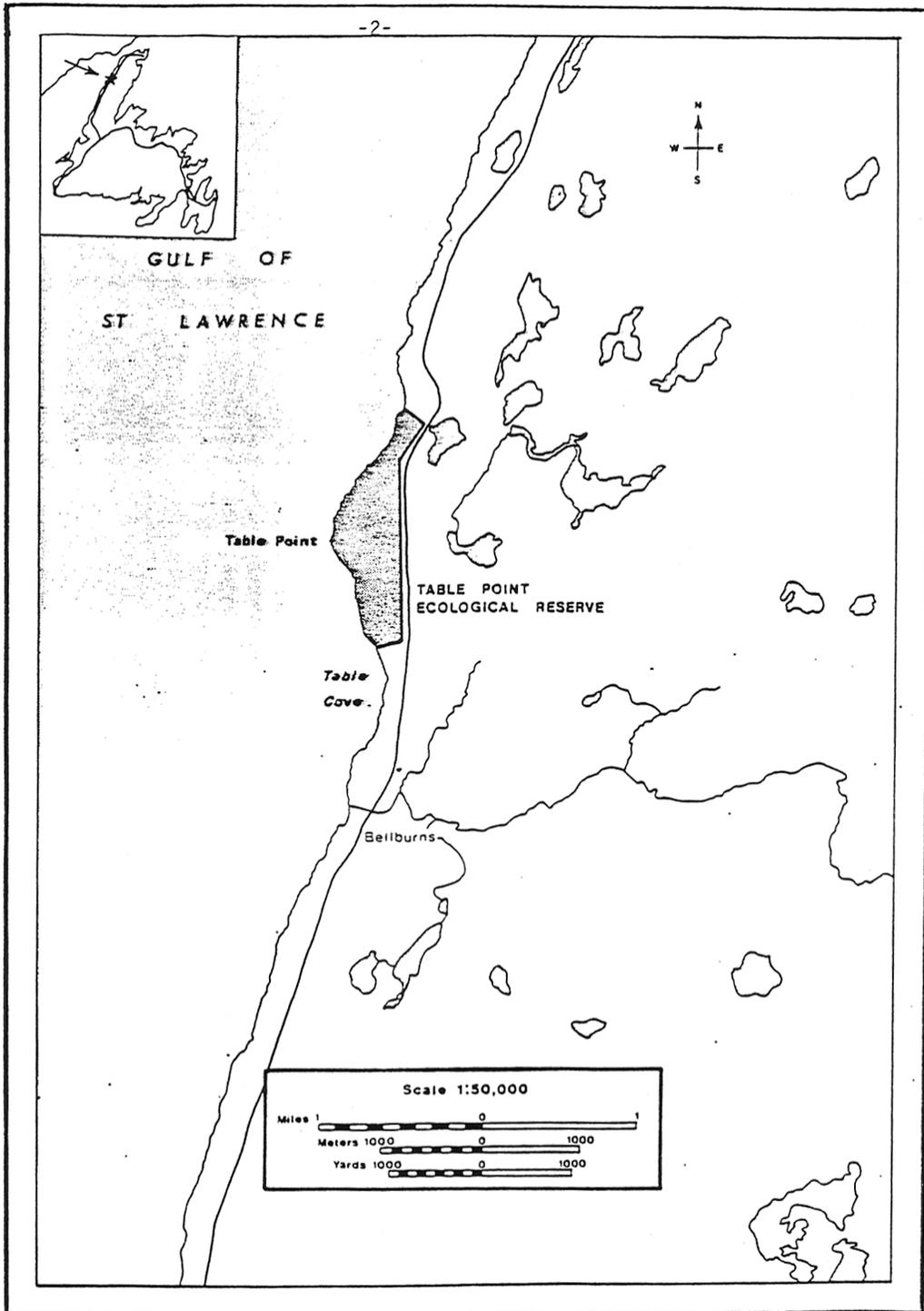


Figure 1: Location of Table Point

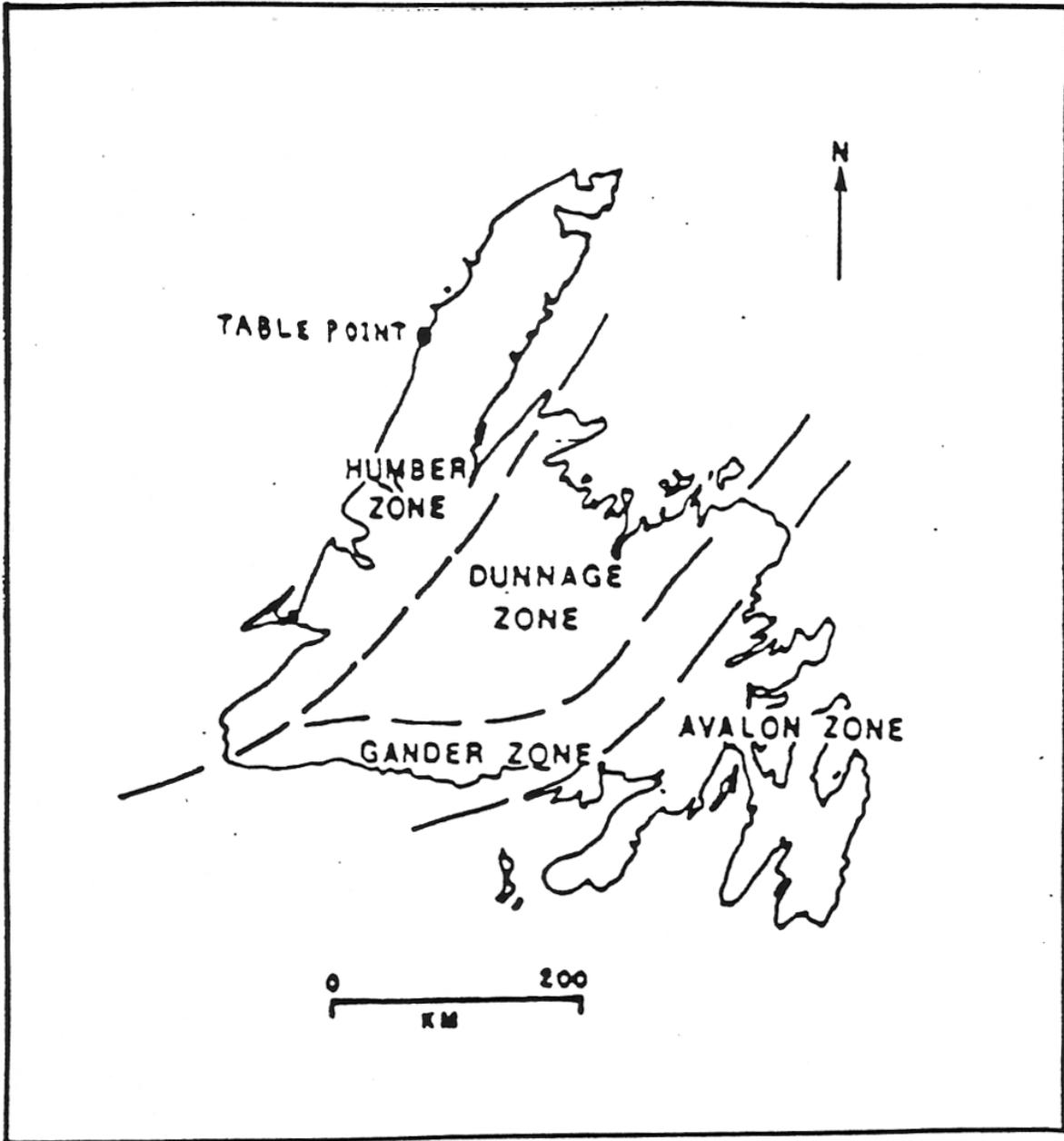


Figure 2: Major Tectonostratigraphic Zones of the Newfoundland Appalachians.

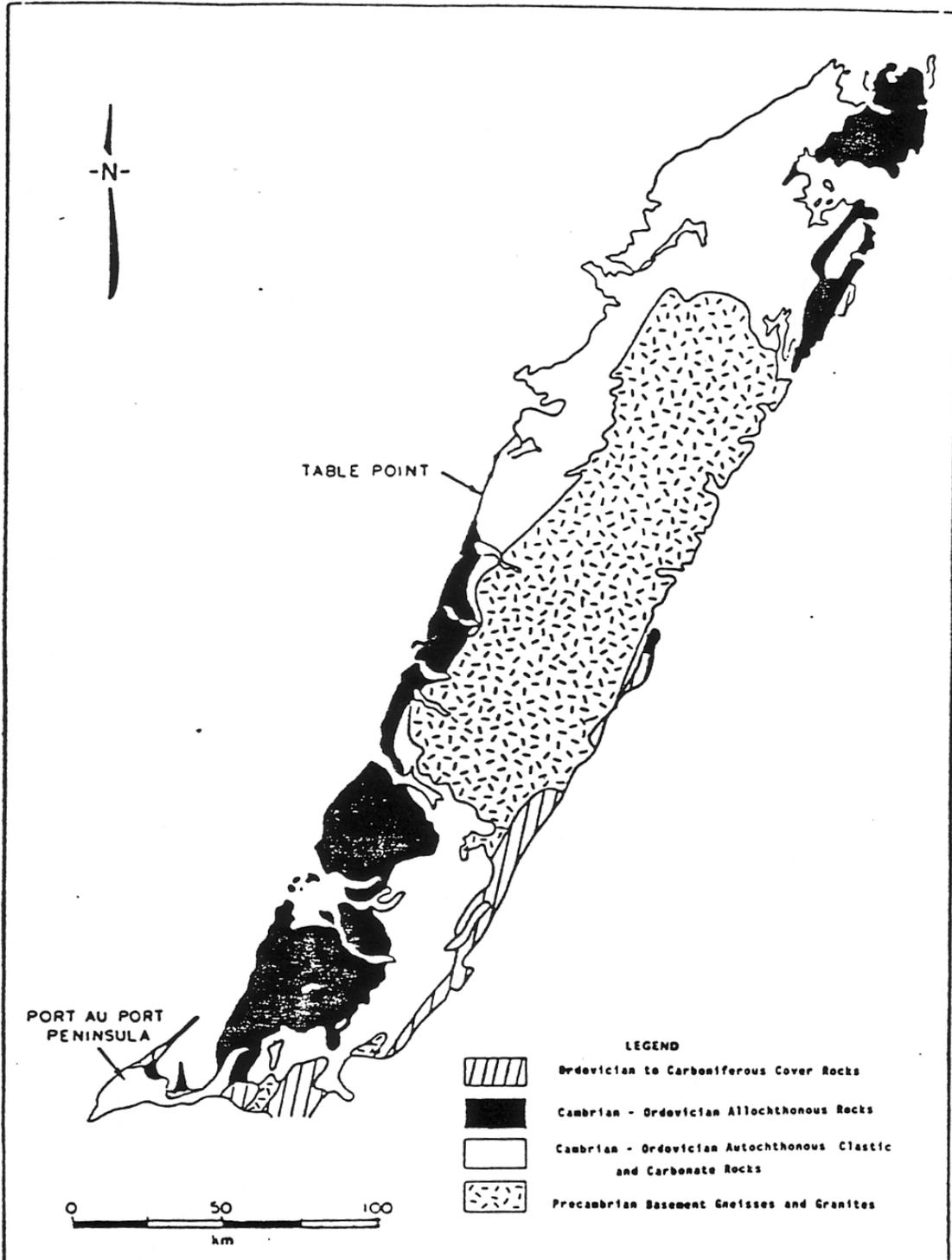


Figure 3: Generalized geological map, Western Newfoundland.

Ocean. Six distinct rock packages record this history. They are as follows:

(1) Precambrian Basement Rocks

The Late Precambrian Grenville age crystalline rocks, which form the core of the Long Range Mountains on the Great Northern Peninsula, unconformably underlie the Early Cambrian to Middle Ordovician autochthonous sedimentary sequence.

(2) Early Cambrian to Middle Ordovician Autochthonous Sedimentary Sequence

The Early Cambrian to Middle Ordovician autochthonous sedimentary sequence includes the Labrador, Port au Port, St. George and Table Head Groups of westerly derived sediments, and the easterly derived Goose Tickle Formation/Mainland Sandstone.

The Early Cambrian to Early Middle Cambrian Labrador Group consists predominantly of clastic sedimentary rocks, but also includes the rift facies flood basalts of the Lighthouse Cove Formation. This group records the initial rifting and opening of the Iapetus Ocean.

The Middle to Late Cambrian Port au Port Group reflects the change from clastic to carbonate deposition and with the Early to Middle Ordovician St. George Group documents the buildup of a rimmed carbonate platform or bank from a carbonate ramp.

The early Middle Ordovician Table Head Group records the submergence

and breakup of the carbonate platform caused by the relatively rapid subsidence of the continental margin prior to the over thrusting or abduction of more oceanward sediments and oceanic crust and mantle, associated with the closing of Iapetus during the Taconic Orogeny.

The easterly derived Goose Tickle Formation/Mainland Sandstone reflects the increasing proximity and erosion of the transported rocks between the early and late Middle Ordovician.

(3) Early Cambrian to Early Ordovician Allochthonous Sedimentary Sequence

The Early Cambrian to Early Ordovician allochthonous sedimentary sequence of the Humber Arm Supergroup consists of two structurally distinct packages. The lower and presumably least transported package consisted of continental edge and proximal to increasingly distal continental slope lime turbidite deposits of the Middle Cambrian to late Early Ordovician Cow Head Group. The higher and presumably more transported package consists of more distal continental slope and deep sea fan clastic turbidite deposits of the Early Cambrian to Early Ordovician Curling Group. The Curling Group was deposited contemporaneously with and farther to the east of the Cow Head Group during the Cambrian—Ordovician; during the Taconic Orogeny the two groups were thrust into juxtaposition over the contemporaneous autochthonous rocks of the carbonate platform.

(4) Allochthonous Cambrian Ordovician Ophiolite Complexes

The rocks of the Bay of Islands and Little Port Complexes and the Lewis Hills Massif represent the structurally highest and furthest transported Cambrian-Ordovician rocks emplaced during the Taconic Orogeny. These rocks represent remnants of oceanic crust and mantle originally situated more oceanward of the most distal sediments of the Curling Group. During the Taconic Orogeny these rocks were obducted over the allochthonous and autochthonous Cambrian-Ordovician sediments.

(5) Parautochthonous Late Middle Ordovician to Early Late Ordovician Sedimentary Cover Rocks

The late Middle Ordovician to early Late Ordovician shallow water carbonate deposits of the Long Point Group unconformably overlie the transported Humber Arm Supergroup rocks on the Port au Port Peninsula. Slightly to the west, these rocks conformably overlie the autochthonous Mainland Sandstone.

The position of the allochthonous Humber Arm sediments between the autochthonous early Middle Ordovician Table Head Group and the Parautochthonous late Middle to Late Ordovician Long Point Group constrains their final emplacement to sometime between the early and late Middle Ordovician.

(6) Neautochthonous Late Silurian to Pennsylvanian Sedimentary Cover Rocks

Unconformably overlying the Middle to Late Ordovician Long Point Group is the Late Silurian and/or Early Devonian Clam Bank Formation, dominated by very shallow water clastic sediments. The time gap between the Long Point and the Clam Bank probably represents the time at which the Long Range was uplifted during the early part of the Acadian Orogeny.

The Mississippian and Pennsylvanian Age Anguille, Codroy and Barchois Groups overlie all the older formations with pronounced unconformity. The sediments of this mixed fluvial-marine molasse sequence include clastic redbeds, limestones and evaporites. They were deposited after the final uplift of the area in the late part of the Acadian Orogeny and the Alleghenian (or Variscan) Orogeny, which subjected all the older formations to erosion as well as further uplifting the Long Range Mountains.

1.3 **Geology of the Reserve Area**

The Table Point Ecological Reserve is underlain by the uppermost units of the St. George Group, most of the Table Head Group and the basal beds of the Goose Tickle Formation. These units, between two major northeast trending faults, form the southern flank of a minor faulted syncline, the axis of which plunges southwestward. The strata within the reserve in general strike northwest and dip southwest at angles ranging from 10 to

45 degrees. Figure 4 shows the geology of the Reserve area.

1.4 **Stratigraphy**

The stratigraphy of the Table Point Ecological Reserve is summarized in Table 1. Description of the rock units follows Schuchert and Dunbar (1934), Whittington and Kindle (1963), Knight (1977), Klappa, Opalinski and James (1980), James and Stevens (1982) and Stouge (1982).

ERA	SYSTEM	SERIES	GROUP	FORMATION
P A L E O Z O I C	O R D O V I C I A N	L L A N V I R N		GOOSE TICKLE 67
				BLACK COVE 16
			T A B L E H E A D	TABLE COVE 94
				TABLE POINT 256
		A R E N I G	S T. G E O R G E	AGUATHUNA 87
				CATOCHE 17

Table 1: Lithostratigraphic Succession, Table Point Ecological Reserve

The oldest rocks exposed within the reserve area comprise the uppermost 20 metres of the Catoche Formation, the second highest unit of the St. George Group. The Catoche Formation normally consists of dark blue-gray lime mudstones, wackestones, packstones and grainstones, which are light blue-gray weathering, thin and rubbly bedded and bioturbated. Here they have undergone extensive diagenesis and have almost entirely been transformed into dark gray dolostone, which are light gray to yellow weathering, massive and coarsely crystalline. The diagenetic fronts are observed to clearly crosscut bedding. The Catoche Formation is conformably overlain by the Aguathuna Formation.

The Aguathuna Formation (the uppermost unit of the St. George Group) is 87 metres thick within the reserve. It consists of buff and blocky weathering, hard, dark gray, argillaceous and siliceous primary dolostone. Sedimentary structures in the dolostone include false and thin bedding, massive and thick bedding, planar and cross-laminates, bioturbation, scours, ripple-marks and mud-cracks. Crypt algal laminates and local stromatolites also occur. A breccia bed within the formation may represent a disconformity. The Aguathuna Formation is conformably overlain by the Table Point Formation, the lowest unit of the Table Point Group.

The Table Point Formation is 256 metres thick within the reserve. It consists of massive, dark blue-gray limestones with minor dolostone and interbedded limestone-dolostone units. The limestones comprise mostly intercalated lime mudstones, bioturbated bioclastic wackestones and

packstones and lenticular and peloidal grain stones, which are light blue-gray and rubbly weathering, internally thin and irregularly bedded, locally stylolitic, occasionally hard and often bituminous. The Table Point Formation is conformably overlain by the Table Cove Formation.

The Table Cove Formation is 94 metres thick within the reserve. The basal beds comprise light blue-gray and rubbly weathering, dark blue-gray limestones, which are thin, irregularly and rubbly bedded. These pass upward into interbedded dark blue-gray to black limestones and black shales. The limestones comprise extremely fine grained, shale lime mudstones, which are light blue—gray and rubbly to hackle weathering, thin and irregularly bedded. Slump folds and lime breccia lenses are locally developed. The Table Cove Formation is conformably overlain by the Black Cove Formation.

The Black Cove Formation is 16 metres thick within the reserve. It consists of dark gray to black graptolitic siltstones, mudstones and shales, which are dark gray to black and blocky weathering, fissile and locally pyrite-rich. Circular mudstones concretions and nodules are also present. The Black Cove Formation is conformably overlain by the Goose Tickle Formation.

The Goose Tickle Formation is at least 67 metres thick within the reserve. It consists of 2 to 30 centimetre thick interbeds of green sandstone and green and greenish gray siltstone and shale. The sandstone is fine to medium grained and slightly calcareous. The siltstone and shale are

micaceous. Minor thin (10-15 centimetre) interbeds of coarse grained green and greenish gray sandstone also occur; these contain gravel-sized chert and limestone clasts, which are angular to well rounded.

1.5 Paleontology

Introduction

The Reserve area historically has been a focus of concerted paleontological investigation because the fossils in the Table Head Group here are so abundant, well preserved and easy to find. In fact, past workers have concentrated on the faunas here generally to the detriment of paleontological investigations into other rock units in western Newfoundland.

Billings (1865) was the first paleontological investigator of the Reserve area. He dealt with the total fauna; in fact, his study remains the most comprehensive treatment of the gastropods. Subsequent workers have been more specialized. They have concentrated on specific groups of organisms. These include:

- (1) brachiopods - Cooper (1956), Ross and James (in press)
- (2) cephalopods - Flower (1968a, 1968b, 1975, 1976a, 1976b, 1978)
- (3) conodonts - Fahraeus (1970), Stouge (1980, 1982, 1984), Stouge in Stouge and Boyce (1983)
- (4) graptolites - Ruedemann (1947), Erdtmann (1971), Boyce (1985), Williams, Boyce and James (in press)

- (5) problematica - Pacquette, Stern and Klappa (1983)
- (6) sponges - Klappa. and James (1980)
- (7) trilobites - Raymond (1925), Whittington (1953, 1961, 1965, 1968), Whittington and Kindle (1963), Boyce (1985), Williams, Boyce and James (in press)

Faunal Elements Present in Reserve Area

The Faunal elements present in each rock formation within the Reserve area are summarized below in order of decreasing stratigraphic position:

Goose Tickle Formation

- fossils not yet recovered

Black Cove Formation

- graptolites, trilobites

Table Cove Formation

- articulate and inarticulate brachiopods, cephalopods, conodonts, echinoderms, graptolites, ostracodes and grilobites

Table Point Formation

- articulate brachiopods, bryozoans, cephalopods, conodonts, echinoderms, gastropods, ostracodes, problematic sponges and trilobites

Aguathuna Formation

- conodonts, gastropods, graptolites (at base), ostracodes (at top) and trilobites (at top)

Catoche Formation

- articulate brachiopods, cephalopods, conodonts, echinoderms, gastropods, ostracodes and trilobites

Age

The uppermost Catoche Formation and the lower part of the Aguathuna Formation below the “breccia bed” are early Ordovician, late Arenig in age (Stouge, 1982; Boyce, 1985). The Aguathuna Formation above the “breccia bed” and the Table Head Group are early Middle Ordovician, early Llanvirn in age (Stouge, 1982). The Goose Tickle Formation also may be of early Middle Ordovician, early Llanvirn age (or younger) within the Reserve, but, so far, no fossils have been recovered to confirm or deny this.

2.0 MANAGEMENT POLICIES

2.1 Introduction

Ecological reserves are established under the Wilderness and Ecological Reserves Act (1980) for the preservation of areas of the province which contain unique or representative species, ecosystems or natural phenomena.

The Table Point Ecological Reserve contains one of the most diverse and well preserved assemblages of Middle Ordovician fossils in the world. This site is of particular interest to students of North American paleontology because it is generally considered to be the type locality for the Middle Ordovician Whiterock Stage of Cooper (1956). Furthermore, the Middle Ordovician faunas of Table Point are well established as representative of the circumcratonic Toquima - Table Head Faunal Realm (Ross and Ingham, 1970).

Table Point encompasses one square kilometer of coastline about 3 km northeast of the community of Bellburns (Fig. 1).

2.2 Management Goal

Table Point is established as an ecological reserve in order to prevent further damage (like that documented by Stouge and Knight, 1981) to an internationally significant and renowned Middle Ordovician biostratigraphic reference section. This management plan will provide guidelines for that protection and for the use of the site for controlled, long term scientific

research and education.

2.3 Management Policies

The overall approach of resource management at the Table Point site will be one which emphasizes the maintenance of the integrity and quality of the fossil-bearing outcrops, and the retention of the reserve area in as natural a state as possible. In keeping with this approach, the following overall management policies are established:

- (a) Within the regulations, scientific research at the site will be permitted and encouraged;
- (b) There will be no removal of materials from the site for other than scientific research purposes and there will be no development within the area;
- (c) Use of the site for educational purposes will be encouraged;
- (d) Use of the site for purposes other than those stated in (b) and (c) above, will be permitted provided they do not conflict with the general objective of site protection and preservation.

3.0 IMPLEMENTATION GUIDELINES

In addition to the requirements of the Wilderness and Ecological Reserves Act, 1980, which apply to all ecological reserves, the following statements serve as a guide to users and managers of the Table Point Ecological Reserve.

3.1 Reserve Management

- (a) The managing agency of Table Point will be Parks and Natural Areas Division of the Department of Environment and Conservation.
- (b) Parks and Natural Areas Division may seek advice and assistance in the management of the Table Point site from appropriate representatives of Memorial University, the Newfoundland Department of Mines and Energy and communities nearest the site.
- (c) The existence of the reserve shall be noted by signs placed at appropriate places along the Viking Trail (Route 430) north and south of the site; the boundary of the reserve will be indicated by signs placed at the shoreline and at major access points and other locations as required. These signs will contain the name of the reserve, the fact that the natural features are legally protected, a phone number and address where more information can be obtained. Additional signs will be placed for safety and security of reserve users (e.g. the cliff face along the reserve west boundary).

- (d) No buildings or other permanent structures will be erected within the reserve.
- (e) Hunting, fishing, trapping, hiking, sheep grazing, net drying and berry picking will be allowed within the reserve since they do not directly affect the integrity of the geological features for which the reserve is established.
- (f) Mapping of the resources of the site at a detailed level will prove beneficial to future monitoring. Such mapping will be produced when funding permits.
- (g) Periodic visits to the site will be made by staff of Parks and Natural Division, Department of Environment and Conservation, to ensure that regulations are being adhered to.
- (h) Every effort will be made to ensure local support for the site and local involvement in site protection.

3.2 Scientific Research

Providing areas for long term scientific research is one of the reasons for creating and managing ecological reserves. It is important, therefore, that research be carried out in such a way that the scientific value of the Reserve is not destroyed or diminished for future investigators.

Accordingly, persons requesting to conduct research within Table Point Ecological Reserve will require a permit from the Parks and Natural Areas Division, Department of Environment and Conservation. Applications for permits should provide a description of the research proposed with an outline of the methodologies and the time frame involved. The following

conditions shall be stipulated for each permit issued:

- (a) All published material related to research done at the site will acknowledge the existence of the Reserve, the Newfoundland Department of Environment and Conservation permissions and the requirements of the researcher;
- (b) a report of the results of each research project will be filed with the Parks and Natural Areas Division, Department of Environment and Conservation and a copy of all scientific papers will be forwarded to the Department and the Newfoundland Museum upon publication;
- (c) when, during the course of scientific research, fossil material has been removed from an ecological reserve for study, a representative suite, consisting of the holotype, paratypes, etc. (e.g. type material) and illustrated/non-illustrated specimens of each fossil species studied will be deposited (with detailed documentation of each specimens geographic and stratigraphic location) with the Newfoundland Museum, Department of Municipal and Provincial Affairs upon the completion and publication of the study. This collection will form part of the province's reference collection of Newfoundland fossils. An additional suite of illustrated specimens will be submitted to the Geological Survey of Canada for the national reference collection.

When practical, staff from the Department of Environment and Conservation will

accompany on-site visits made by researchers and educational groups in order to record and monitor the impact on site.

3.3 Educational Use

The site may be used for educational purposes as long as such use does not have a negative impact upon the scientific value of the Reserve or the integrity of the Reserve itself. Use of geological hammers of any sort for educational purposes will not be allowed. Permits will be required for institutions, individuals and groups wishing to utilize the area. Such permits can be obtained from the Parks and Natural Areas Division, of the Department of Environment and Conservation.

In keeping with the general management policy to retain the site in as natural a state as possible, there will be no development of facilities within the reserve. The only on-site development will be the posting of signs, as stipulated above, at points along the boundary.

Information concerning the reserve will be distributed to the public through the Department of Environment and Conservation.

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RESERVE ORDER AND REGULATIONS

THE NEWFOUNDLAND GAZETTE

March 9, 1990

NEWFOUNDLAND REGULATION 72/90

Table Point Ecological Reserve Order, 1990
under
The Wilderness and Ecological Reserves Act
(O.C. 261/90)

(Filed March 7, 1990)

Under and by virtue of section 18(1) of *The Wilderness and Ecological Reserves Act*, and acting on the advice of the Wilderness and Ecological Reserves Advisory Council, the Lieutenant-Governor in Council has been pleased to establish the Table Point Ecological Reserve on the Great Northern Peninsula for the purpose of protecting one of the most diverse and well preserved assemblages of Middle Ordovician fossils in the world for scientific study and educational purposes.

Dated at St. John's this 6th day of March, 1990.

H.H. STANLEY
Clerk of the Executive Council

ORDER

1. This Order may be cited as the Table Point Ecological Reserve Order, 1990.
2. The area included in the Table Point Ecological Reserve is set out in Schedule A.
3. An outline of the Table Point Ecological Reserve Management Plan is set out in Schedule B.

SCHEDULE A

All that piece or parcel of land Situate and being on the west coast of the Northern Peninsula in the Electoral District of St. Barbe abutted and bounded as follows, that is to say: Beginning at a point at the low water mark on the easterly shoreline of the Gulf of St. Lawrence, 2 km north of the community of Beliburns. the said point having coordinates of North 5577550 metres and East 462050 metres; thence running in an easterly direction for a distance of 250 metres more or less to a point, the said point having coordinates North 5577600 metres and East 462300 metres; thence running in a Northerly direction for a distance of 1825 metres more or less to a point, the said point having coordinates North 5579450 metres and East 462250 metres; thence running in a Northeasterly direction for a distance of 475 metres to a point, the said point having coordinates North 5579825 metres and East 462475 metres; thence running in a Northwesterly direction for a distance of 275 metres more or less to a point at the low water mark on the aforesaid easterly shoreline of the Gulf of St. Lawrence, the said point having coordinates North 558000 metres and East 3.62300 metres; thence following the low tide mark in a southerly direction to the point of beginning and containing an area of 1.16 square kilometres more or less, all bearings being referred to Zone 21 of the Universal Transverse Mercator Projection.

SCHEDULE B

Outline of Table Point Ecological Reserve Management Plan

The area known as Table Point is established as an Ecological Reserve to preserve the diverse and well preserved fossils found there. To accomplish this, there will be no removal of material from the site except under specific permit, and there will be no development on the Reserve. Scientific research at the site will be encouraged, and educational use will be permitted where it does not conflict with the general objectives of preservation and scientific research. Hunting, fishing, trapping, walking, sheep grazing and net drying will be permitted.

THE NEWFOUNDLAND GAZETTE
March 9, 1990

NEWFOUNDLAND REGULATION 73/90

Table Point Ecological Reserve Regulations, 1990
under
The Wilderness and Ecological Reserves Act
(O.C. 261-90)

(Filed March 7, 1990)

Under and by virtue of the powers conferred upon him pursuant to section 28 of *The Wilderness and Ecological Reserves Act*, His Honour the Lieutenant-Governor in Council has been pleased to make the following regulations.

Dated at St. John's this 6th day of March, 1990.

H.H. STANLEY
Clerk of the Executive Council

REGULATIONS

1. These regulations may be cited as the Table Point Ecological Reserve Regulations, 1990.
2. Any person or group wishing to enter the Reserve for the purpose of studying, interpreting or otherwise viewing the fossils present must first obtain a permit from Parks Division, Department of Environment and Lands. Hunting, fishing, trapping, hiking, sheep grazing, net drying and berry picking do not require entry permits.
3. There will be no removal or dislocation of any material within the Reserve (including rubble piles) except for scientific study - this only when the researcher is the holder of a valid permit, and only to the extent or conditions specified on his or her permit.
4. There will be no construction of permanent structures such as houses, roads, stages, etc. within the Reserve.
5. There will be no use of motorized transportation within the Reserve.
6. All garbage shall be removed from the Reserve.
7. Prospecting, claim staking, mining and quarrying will be prohibited in the Reserve.
8. The use of explosives, mechanical and electrical rock cutting or removal tools (e.g. tile saws, percussion hammers), is expressly forbidden in the Reserve. Scientific researchers who hold a valid permit will be allowed to use geological hammers, sledge hammers and rock chisels, only if they are deemed necessary for the research.
9. All hunting and fishing within the Reserve is allowed in accordance with permits or licences issued under *The Wildlife Act*, *The Migratory Birds Convention Act* or *The Federal Fisheries Act*.