Economic Strategies and Community Patterning at the Providence Bay Site, Manitoulin Island

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The Providence Bay site (BkHn-3) on the south shore of Manitoulin Island has produced a large faunal assemblage representing a late precontact/early contact period occupation. This paper provides basic descriptive and previously unavailable information about this important site and combines the results of the authors' independently conducted faunal analyses to identify and reconstruct subsistence activities. The large faunal sample provides the database for a reconstruction of the subsistence and dietary preferences of the site's occupants, the seasons of site occupation, and the procurement strategies practiced at the site. A comparison of faunal density and the density of important species of animals provides evidence to support the hypothesis that community and household economic activities can be identified at the Providence Bay site.

Introduction

Along the south shore of Manitoulin Island, behind the wide sandy beach of a sheltered cove known as Providence Bay (Figure 1), a large archaeological site has revealed evidence of the homes, material culture, ritual activities and subsistence strategies of a Late Woodland and early contact period community. The analysis of the faunal remains from the site contributes to an understanding of the ecological relationships between the residents and their environment and of the economic strategies of households, the community, and the region.

The Providence Bay site was excavated from 1985 through 1988 under the direction of Thor Conway, then of the Ontario Ministry of Culture and Communications. Although only a preliminary draft report on the excavation is available (Conway 1988), the Providence Bay site has been featured in the recent literature concerned with Late Woodland and contact periods in the Upper Great Lakes Late Woodland (Fox 1990; Milner 1998; Molnar 1997; Smith 1989, 1996, 2000).

During the years of site excavation, faunal assemblages were made available to both authors independently (Prevec 1986, 1989a, 1989b; Smith 1988); this approach resulted in separate data sets, often from adjacent excavation units. These data sets have remained largely unavailable to other researchers. This paper is intended to report the combined results of the findings of both faunal researchers; present an interpretation of subsistence and procurement strategies; apply faunal analysis to aid in interpreting activity areas; and to situate these interpretations within the cultural landscape of the dynamic, early contact period.

The Regional and Historical Context of the Providence Bay Site

In the late precontact and early contact periods, the Providence Bay site was a large, important community on Manitoulin Island in the heart of the traditional territory of the Odawa. The site may have been, in fact, a principal village of the Sable Odawa, translated as the "People of the Sandy Beach" (Smith 1996:82).

The Providence Bay site has made important contributions to recent work concerned with Odawa fishing strategies. Molnar (1997) applied fine-scale intra-site spatial analysis of fish remains at the Hunter's Point site (BjHg-3) on the Bruce Peninsula using cluster analysis to demonstrate variation in the importance of different fishing strategies. He used this approach to compare Hunter's Point with other late precontact and early contact period sites on the Bruce Peninsula and Manitoulin Island, including the Providence Bay site.

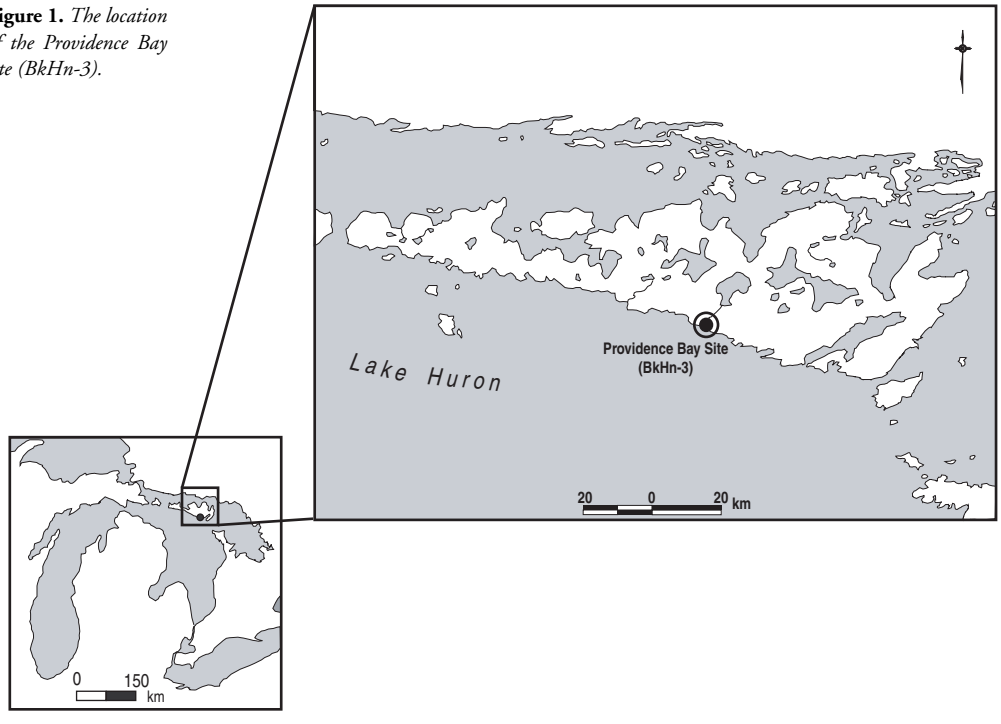

Figure 1. *The location of the Providence Bay site (BkHn-3).*

A detailed study of stylistic variation of Juntunen ceramics provides the database for Milner's (1998) chronological sequencing of Upper Great Lakes sites in the Late Woodland period, including the Providence Bay site. Milner identified subregions of ceramics as indicative of socially identified groups who participated in "...intensive symbiotic exchange relationships with inter-regional groups to broaden the area from which they could potentially acquire resources during more frequent bad years" (Milner 1998:334)

There is, indeed, ample ethnohistoric evidence that the early contact period Odawa were important players in a system of regional exchange in the early seventeenth century (Smith 1996:92-7; Waisberg 1977; Wright 1967). The Providence Bay site provided an important source of data in the primary author's analysis of human nutritional requirements, sustainable yields of mammalian species, and preferred mammals for consumption as evidenced by faunal remains at sites throughout the Upper Great Lakes (Smith 1996). That study concluded, in part, that "...the proportion of beaver and cervids estimated in the diet of the Odawa could not have been derived entirely from within their territory..." and that a wide-spread "...exchange network was a critical component of the Odawa subsistence strategy" (Smith 1996:278).

A Brief Summary of the Cultural Occupations

The dominant cultural period at the Providence Bay site dates to the latter part of the sixteenth and early part of the seventeenth centuries and is designated as Stratum II. The presence of Period II glass trade beads, a French iron trade ax, an iron knife, cut brass scraps and cut pieces of copper kettle support this early contact period temporal designation (Conway 1988:229-234). Milner's analysis of Juntunen ware ceramics indicates that the occupation falls within the late Juntunen period, ca. A.D. 1450-1600 (1998:427) The dominance of Sidey Notched Iroquoian vessels is consistent with this temporal estimation for Stratum II as well. At least three well-defined "longhouse-like" structures and possibly additional houses, as well as two veneer middens, containing ritually buried animals, are associated with this occupation. There is some

evidence that the village was contained within a palisade. The core of the village covered 0.625 hectare (1.54 acres), but there are indications of less intensive cultural activity covering an area of almost nine hectares (Conway 1988:Table 1).

In one excavation block of four square metres, the excavators recognized evidence of an earlier occupation, designated as Stratum III; this occupation produced one storage pit, three hearths, fourteen post moulds, ceramics, lithics, and faunal remains (Conway 1988:144). While no date has been assigned to Stratum III, the presence of cord-impressed Juntunen ceramics suggest that this occupation also falls within the late Late Woodland period, ca. 1450-1600 (Milner 1998: 426). The spatial extent and nature of this earlier occupation is not well understood.

The site also produced sparse and intermittent evidence of a later historic occupation, tentatively dated to ca. A.D. 1850-1870 (Conway 1988:24). The material culture and subsistence remains of this period are recorded as "surface" or Stratum I and are stratigraphically separate from Stratum II. There are no data as yet regarding this occupation and, therefore, the small assemblage of associated faunal remains is not included in this report.

Geography and Geomorphology

The south shore of Manitoulin Island is underlain by Palaeozoic sedimentary rocks, especially limestones, dolomites, sandstones, and shales (Robertson and Card 1972). With the relative stabilization of Lake Huron water levels about 4,000 years ago, Manitoulin Island was left with a relatively thin covering of grey brown luvisols, including sand, silt, clay, and some gravels (Larson 1987; Rowe 1972). The exposure of the south shore to prevailing westerly and southwesterly winds results in a shorter growing season at Providence Bay than at interior localities on the island; while Providence Bay averages slightly less than 120 frost free days, the inland community of Manitouaning enjoys almost 160 frost free days each year (Boughner et al. 1956). Pollen profiles from Manitoulin Island suggest that in post-glacial times meadows and open scrub land were dominant and that the island was never heavily forested (Karrow and Warner 1991:31).

The Archaeological Excavations

The Providence Bay site is located on a stable sand dune along the east bank of the Mindemoya River near its mouth at Providence Bay. Within the core area of the site, 107 square metres were excavated, representing about one percent of the occupation area. Three or possibly four longhouse-like structures were identified on the basis of post mould patterning. The houses were aligned along the riverbank, although the western portions of these structures have eroded into the river. To the east, six additional areas, termed "Units", were excavated in one metre squares. Fine-scale recovery techniques, i.e. water screening through three millimetre mesh and flotation, were employed to process the soil matrix from all cultural strata and features (Conway 1988:32-33). Although no formal map of the site is available, a map depicting the approximate location of the excavation units is presented in Figure 2.

Cultural material was recovered from house floors, pits, and middens. Cultural material at the site was well preserved in the sand matrix underlying the A soil horizon. Ceramics (123 vessels, 13 pipes), lithics (244 tools), trade goods (beads, metal artifacts), paleobotanical specimens (311 occurrences), and faunal remains (38,793 specimens) comprise a rich assemblage of artifacts representing the Late Woodland/early contact period occupation (Conway 1988; Fecteau 1987, 1988, 1989; Prevec 1986, 1989a; Smith 1988).

Faunal Analysis

The method of faunal analysis and reporting follows standard zooarchaeological procedure. All bone specimens were identified to as precise a zoological taxon as possible. Each specimen was recorded according to taxon, element, side, cultural and/or natural alteration (such as burning and butchering), and any information regarding the individual represented by the element, including size, sex or pathology.

There is a high degree of consistency regarding the methods employed by each faunal analyst

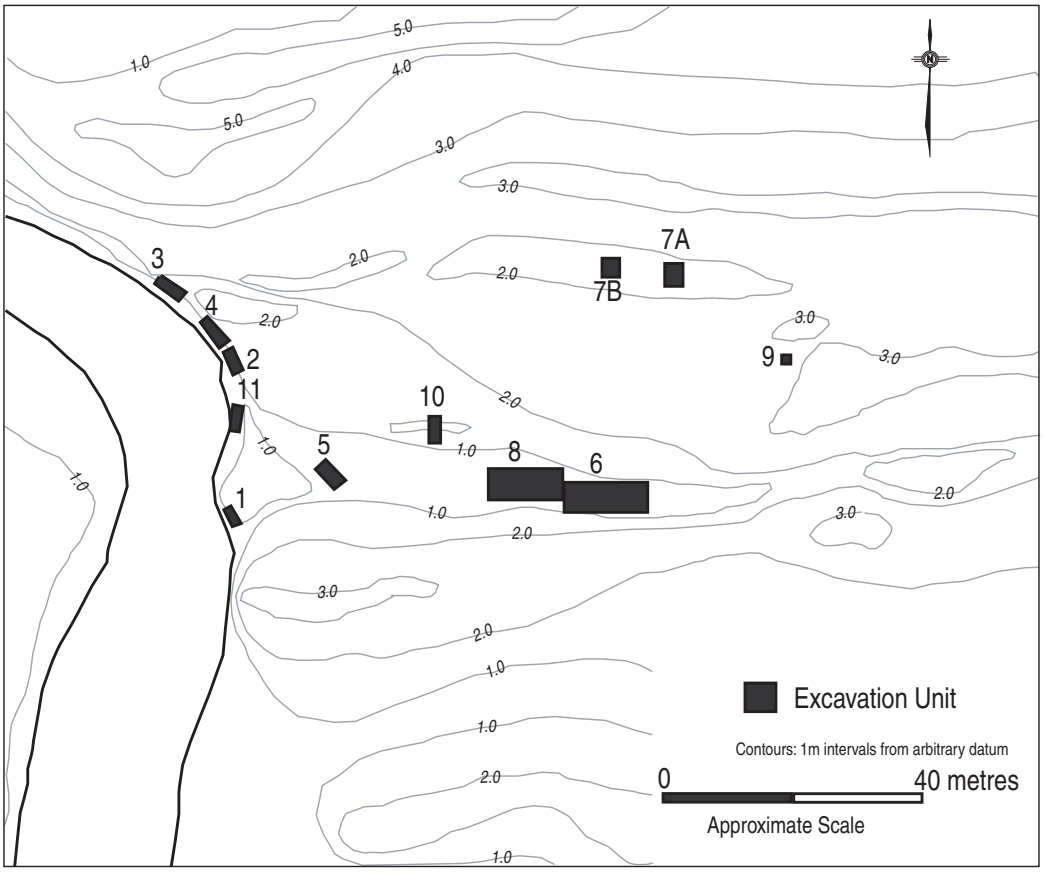

Figure 2. *The approximate size and locations of excavation units at the Providence Bay site.*

and the assemblages are highly comparable. Both analysts employed the same methods of summarizing the data. Both analysts identified complete fish vertebrae to a zoological taxon as either genus (Prevec) or family (Smith). Both analysts noted a discernable morphological difference between the vertebrae of lake trout and whitefishes and these distinguishable taxa are recorded as *Salvelinus*/Salmonidae and *Coregonus*/Coregonidae respectively in this analysis.

In this paper, the results of the faunal analysis for Stratum II are reported as NISP (number of identified specimens) for each Unit (Tables 1-4) and by MNI (minimum number of individuals) for the occupation as a whole (Table 5). MNI was calculated based upon the most frequently occurring element, taking into consideration side and size. Because the Units are relatively widely separated spatially, MNI was calculated independently for each unit since it is assumed that any given individual animal would not be represented in more than one unit. The MNI for each species in each unit was totaled to produce an estimate of the minimum number of individual animals represented by the faunal sample for the site. From MNI, the relative importance of species in terms of meat contribution was calculated. Estimates of meat contribution was taken from Cleland's (1970) faunal analysis from Fort Michilimackinac in the Upper Great Lakes; his method is derived from White's (1953) method which calculates available meat based upon a percentage of the average live weight for each species. A total of 37,803 specimens and 374 individual animals represent the faunal assemblage from Stratum II, the Late Woodland/early contact occupation. This total is exclusive of the animal bundle burials associated with this occupation.

Table 1. *The distribution of mammalian faunal remains (NISP) from Stratum II, Providence Bay site.*

Taxon ID	Common Name	Unit 3 House 1	Unit 2/4 House 2	Unit 11 House 3	Unit 1 House 4	Unit 6/8 Midden	Unit 7A House?	Unit 7B Midden	Unit 9 Midden?	Unit 5 House?	Unit 10 Midden?	Test Pits	Total
Lepus americanus	Snowshoe hare	14	5	3	1	12	2	21	10	2	10	1	**81**
Leporidae sp.	Hare/Rabbit family	5	3	3	1	6	–	–	–	4	1	–	**23**
Tamias striatus	Eastern chipmunk	–	–	–	–	2	–	5	–	–	2	–	**9**
Tamiasciurus hudsonicus	Red squirrel	1	3	1	–	7	–	7	3	–	–	–	**22**
Castor canadensis	Beaver	13	12	3	–	317	2	45	14	7	21	2	**436**
Castor canadensis cf.	Beaver (probably)	–	–	–	–	13	–	–	–	–	1	–	**14**
Ondatra zibethicus	Muskrat	2	–	–	–	1	–	3	–	–	–	–	**6**
Muridae sp.	Mouse/Rat family	–	–	–	1	–	–	–	–	–	–	–	**1**
Rodentia sp.	Order	–	–	–	–	–	–	1	–	–	1	–	**2**
Canis familiaris	Domestic dog	–	–	–	–	11	1	15	1	–	27	–	**55**
Canis sp.	Dog/Wolf	–	1	–	–	14	–	2	–	–	1	–	**18**
Vulpes vulpes	Red fox	–	1	–	–	–	–	2	–	–	–	–	**3**
Ursus americanus	Black bear	5	6	–	–	7	–	–	–	1	1	–	**20**
Proycon lotor	Raccoon	–	–	–	–	–	–	2	1	–	2	–	**5**
Martes americana	Marten	1	–	–	–	1	–	2	–	–	–	–	**4**
Martes pennanti	Fisher	1	–	–	–	–	–	–	–	–	–	–	**1**
Mustela vison	Mink	26	–	–	–	–	–	–	–	–	–	–	**26**
Mephitis mephitis	Striped skunk	–	–	–	–	1	–	1	–	–	–	–	**2**
Lutra canadensis	River otter	10	2	–	–	5	–	2	–	–	9	–	**28**
Lynx canadensis	Lynx	–	–	–	–	1	–	–	–	–	–	–	**1**
Carnivora sp.	Order	–	–	–	–	2	–	–	–	–	1		**3**
Rangifer tarandus	Caribou	11	–	–	–	–	–	–	–	1	1		**13**
Odocoileus virginianus	White-tailed deer	5	–	1	–	10	3	6	28	1	7	1	**62**
Alces alces	Moose	13	2	1	2	1	1	3	37	–	–	–	**60**
Cervidae sp.	Deer/Caribou family	15	10	–	–	–	–	7	14	–	2	–	**48**
Subtotal		122	45	12	5	411	9	124	108	16	87	4	**943**
Mammalia sp.		418	335	58	3	1,149	29	161	1,962	57	375	6	**4,553**
Total		**540**	**380**	**70**	**8**	**1,560**	**38**	**285**	**2,070**	**73**	**462**	**10**	**5,496**

Table 2. *The distribution of osteichthyes faunal remains (NISP) from Stratum II, Providence Bay site.*

Taxon ID	Common Name	Unit 3 House 1	Unit 2/4 House 2	Unit 11 House 3	Unit 1 House 4	Unit 6/8 Midden	Unit 7A House?	Unit 7B Midden	Unit 9 Midden?	Unit 5 House?	Unit 10 Midden?	Test Pits	Total
Acipenser fulvescens	Lake sturgeon	6	–	–	3	2	–	9	–	–	–	–	**20**
Coregonus clupeaformis	Lake whitefish	–	–	–	1	99	–	58	36	–	14	–	**208**
Coregonidae sp.	Whitefish family	15	–	4	–	51	2	4	1	–	6	–	**83**
Salvelinus namaycush	Lake trout	6	1	–	–	34	–	–	1	–	–	–	**42**
Salvelinus/Salmonidae sp.	Trout genus/family	25	29	20	–	777	9	412	4	–	148	10	**1,434**
Esox sp.	Pike/Muskellunge	1	–	–	–	4	–	1	–	–	–	–	**6**
Cyprinidae sp.	Minnow/Carp Family	–	–	–	–	–	4	–	–	–	–	–	**4**
Catostomus catostomus	Longnose sucker	1	14	12	–	116	–	–	–	–	18	–	**161**
Catostomus commersoni	White sucker	2	–	3	–	120	–	1	–	–	12	–	**138**
Moxostoma erythrurum	Goldon redhorse	–	1	–	–	1	–	–	–	–	–	–	**2**
Moxostoma sp.	Redhorse	–	1	–	–	–	–	–	–	–	–	–	**1**
Catostomus/Catostomidae sp.	Sucker/Redhorse family	98	48	118	8	2,578	15	1,022	213	1	750	2	**4,853**
Lota lota	Burbot	–	–	1	–	25	–	1	1	–	11	–	**39**
Ictaluridae sp.	Catfish/Bullhead family	–	–	4	–	6	–	–	–	–	–	–	**10**
Ambloplites rupestris	Rock bass	–	–	–	–	2	–	–	–	–	–	–	**2**
Micropterus dolomieui	Smallmouth bass	–	–	–	–	–	1	1	–	–	–	–	**2**
Micropterus salmoides	Largemouth bass	–	–	–	–	1	–	–	–	–	–	–	**1**
Centrarchidae sp.	Bass/Sunfish family	1	–	–	–	5	–	–	–	–	–	–	**6**
Perca flavescens	Yellow perch	–	2	1	–	–	–	–	–	–	–	–	**3**
Stizostedion vitreum	Yellow walleye	13	1	v	4	10	2	8	12	–	–	688	**738**
Stizostedion sp.	Walleye/Sauger	3	–	–	2	4	–	6	22	3	14		**54**
Percidae sp.	Perch/Walleye family	14	8	3	21	126	1	4	1	4	8	11	**201**
Subtotal		185	105	166	39	3,961	34	1,527	291	8	981	711	**8,008**
Osteichthyes sp.		269	123	369	24	17,363	38	1,986	391	17	1,208	305	**22,093**
Total		**454**	**228**	**535**	**63**	**21,324**	**72**	**3,513**	**682**	**25**	**2,189**	**1,016**	**30,101**

Table 3. *The distribution of avian faunal remains (NISP) from Stratum II, Providence Bay site.*

Taxon ID	Common Name	Unit 3 House 1	Unit 2/4 House 2	Unit 11 House 3	Unit 1 House 4	Unit 6/8 Midden	Unit 7A House?	Unit 7B Midden	Unit 9 Midden?	Unit 5 House?	Unit 10 Midden?	Test Pits	Total
Gavia immer	Common loon	30	19	5	–	72	8	57	8	2	71	2	**274**
Ardea herodias	Great blue heron	–	1	–	–	–	–	–	–	–	1	–	**2**
Anas discors	Blue-winged teal	–	2	–	–	–	–	–	–	–	–	–	**2**
Aythya americana	Redhead	1	–	–	–	–	–	–	–	–	–	–	**1**
Aix sponsa	Wood duck	1	–	–	–	–	–	–	–	–	–	–	**1**
Mergus merganser/serrator	Merganser	–	–	–	–	5	–	–	–	–	2	–	**7**
Anatidae sp.	Duck/Goose family	4	1	1	–	1	–	3	–	1	1	–	**12**
Bonasa umbellus	Ruffed grouse	–	–	–	–	12	–	2	–	–	6	1	**21**
Tetraonidae sp.	Grouse family	–	–	1	–	–	–	–	2	–	1	–	**4**
Ectopistes migratorius	Passenger pigeon	–	–	1	–	–	–	–	–	–	–	–	**1**
Laridae sp.	Gull family	–	–	–	–	1	–	–	–	–	–	–	**1**
Pandion haliaetus cf.	Osprey (probably)	–	2	–	–	–	–	–	–	–	–	–	**2**
Heliaeetus leucocephalus	Bald eagle	–	–	–	–	7	11	1	–	–	–	–	**19**
Accipitridae sp.	Hawk/Eagle family	–	–	–	–	–	–	2	–	–	–	–	**2**
Strigidae sp.	Owl family	–	–	–	–	1	–	–	1	–	–	–	**2**
Corvus corax	Common raven	–	–	–	–	–	–	–	–	–	–	1	**1**
Subtotal		36	25	8	–	99	19	65	11	3	82	4	**352**
Aves sp.		39	26	14		161	17	63	1	6	81	4	**412**
Total		**75**	**51**	**22**	–	**260**	**36**	**128**	**12**	**9**	**163**	**8**	**764**

Table 4. *The distribution of other class faunal remains (NISP) from Stratum II, Providence Bay site.*

Taxon ID	Common Name	Unit 3 House 1	Unit 2/4 House 2	Unit 11 House 3	Unit 1 House 4	Unit 6/8 Midden	Unit 7A House?	Unit 7B Midden	Unit 9 Midden?	Unit 5 House?	Unit 10 Midden?	Test Pits	Total
Chrysemys picta	Painted turtle	6	–	–	–	3	–	–	–	–	1	–	**10**
Emydoidea blandingii	Blanding's turtle	–	–	–	–	1	1	1	–	–	–	–	**3**
Graptemys geographica	Map turtle	–	1	–	–	–	–	–	–	–	–	–	**1**
Chelydra serpentina	Northern snapping turtle	–	1	–	–	8	–	–	–	–	–	–	**9**
Cryptodira sp.	Order	–	1	–	–	8	–	–	–	–	2	–	**11**
Thamnophis cf. *sirtalis*	Garter snake (probably)	–	–	1	–	–	–	–	–	–	–	–	**1**
Anura sp.	Frog	–	–	–	–	–	–	–	–	–	1	–	**1**
Total		6	3	1	–	20	1	1	–	–	4	–	**36**
Pelecypoda sp.	Bivalve	–	1	–	–	61	–	8	1	–	1	–	**72**
Gastropoda sp.	Snail	–	–	–	–	1	–	–	–	5	3	–	**9**
Class indeterminate		113	301	20	24	395	26	164	132	88	62	–	**1,325**
Total		**113**	**302**	**20**	**24**	**457**	**26**	**172**	**133**	**93**	**66**	–	**1,406**
Site Total - All Classes		***1,188***	***964***	***648***	***95***	***23,621***	***173***	***4,099***	***2,897***	***200***	***2,884***	***1,034***	***37,803***

Table 5. *Estimated minimum number of individuals and meat contribution at the Providence Bay Site.*

Faunal Category	lbs. meat/ind	kg. meat/ind	MNI	Total lbs.	Total kg.	%
Rabbit/Hare	2.1	1.0	16	33.6	15.3	0.7
Chipmunk/Squirrel	0.2	0.1	4	0.8	0.4	0.0
Muskrat	3.0	1.4	4	12.0	5.5	0.3
Beaver	31.5	14.3	21	661.5	300.7	13.9
Black bear	210.0	95.5	2	420.0	190.9	8.8
Dog/Wolf	15.0	6.8	8	120.0	54.5	2.5
Small Carnivore	2.1	1.0	20	42.0	19.1	0.9
White-tailed deer	85.0	38.6	8	680.0	309.1	14.3
Caribou	187.5	85.2	4	750.0	340.9	15.8
Moose/Lg. Cervid	400.0	181.8	3	1,200.0	545.5	25.2
Common Loon	4.0	1.8	27	108.0	49.1	2.3
Heron/Goose	6.4	2.9	4	25.6	11.6	0.5
Duck	2.0	0.9	10	20.0	9.1	0.4
Grouse	1.1	0.5	9	9.9	4.5	0.2
Passenger Pigeon	0.8	0.4	1	0.8	0.4	0.0
Raven	2.4	1.1	1	2.4	1.1	0.1
Lake Sturgeon	36.0	16.4	5	180.0	81.8	3.8
Lake trout	14.4	6.5	15	216.0	98.2	4.5
Whitefish	10.4	4.7	9	93.6	42.5	2.0
Pike/Muskellunge	2.4	1.1	3	7.2	3.3	0.2
Sucker/Redhorse	0.4	0.2	168	67.2	30.5	1.4
Burbot	2.0	0.9	3	6.0	2.7	0.1
Bullhead	0.4	0.2	1	0.4	0.2	0.0
Bass	1.6	0.7	4	6.4	2.9	0.1
Walleye/Sauger	5.6	2.5	13	72.8	33.1	1.5
Yellow perch	0.3	0.1	2	0.6	0.3	0.0
Snapping turtle	10.0	4.5	2	20.0	9.1	0.4
Other turtles	0.4	0.2	7	2.8	1.3	0.1
Total			**374**	**4,759.6**	**2,163.5**	**100.0**

The faunal assemblage representing the earlier Late Woodland occupation, Stratum III, totals 990 specimens. The NISP for each identified taxon is reported by archaeological context; this assemblage is confined exclusively to Unit 7B (Table 6).

Stratum II Faunal Findings and Subsistence

A wide variety of animal species was identified from Stratum II, although certain taxonomic groups are more dominant than others in the assemblage (Tables 1-4). Almost 80 percent of the faunal assemblage is bony fish while mammals comprise 14.5 percent; the other faunal classes, birds, reptile/amphibian, and invertebrates, each comprise two percent or less of the total faunal assemblage. Only 3.5 percent of the faunal assemblage was so fragmented that a zoological class could not be assigned with any degree of certainty; this low proportion is evidence of the excellent preservation and high integrity of bone specimens, especially since the assemblage was recovered by fine-scale techniques.

Certain species appear to have been preferred in the Providence Bay diet. Beaver (*Castor canadensis*), bear (*Ursus Americanus*), cervids, loon (*Gavia immer*), and fish, especially sucker (*Catostomus* sp.), lake trout (*Salvelinus namaycush*), and whitefish (*Coregonidae* sp.), are important in terms of meat contribution. Cervids, i.e., white-tailed deer (*Odocoileus virginianus*), caribou (*Rangifer tarandus*), and moose (*Alces alces*), contributed approximately 50 percent of meat to the diet, while black bear contributed about nine percent, and beaver and fish each contributed about 14 percent; the remaining 13 percent of the diet comprised a variety of small mammals, birds, and turtles (Table 5).

Plants also contributed to the diet of the residents of the Providence Bay site. A small number of maize (*Zea mays*) kernels (n=18), beans

Table 6. *Faunal findings from Stratum III at the Providence Bay site.*

Taxon ID	Common Name	Midden	Storage Pit Feature 81	Post Moulds #5	#6	#9	Total
Lepus americanus	Snowshoe hare	–	–	–	1	–	1
Tamias striatus	Eastern chipmunk	–	–	1	–	–	1
Castor canadensis	Beaver	1	–	–	–	–	1
Lutra canadensis	River otter	1	–	–	–	–	1
Subtotal		**2**	**–**	**1**	**1**	–	**4**
Mammal sp. med.+	Beaver size or larger	3	–	–	–	–	3
Mammal sp.		28	–	–	–	–	28
Total		**33**	**–**	**1**	**1**	–	**35**
Coregonus clupeaformis	Lake whitefish	–	–	–	2	–	2
Coregonidae sp.	Whitefish family	–	1	–	2	–	3
Salvelinus/*Salmonidae* sp.	Trout genus/family	2	–	3	11	1	17
Catostomus catostomus	Longnose sucker	1	–	–	–	–	1
Catostomus commersoni	White sucker	1	–	–	–	–	1
Catostomus/*Catostomidae* sp.	Sucker genus/family	20	14	89	46	131	300
Percidae sp.	Perch/Walleye family	3	–	–	–	–	3
Subtotal		**27**	**15**	**92**	**61**	**132**	**327**
Osteichthyes sp.		9	32	152	101	300	594
Total		**36**	**47**	**244**	**162**	**432**	**921**
Gavia immer	Common loon	4	–	–	5	–	9
Subtotal		**4**	**–**	–	**5**	–	**9**
Aves sp. large	Loon size or larger	8	–	–	–	–	8
Total		**12**	**–**	–	**5**	**0**	**17**
					–	–	
Pelecypoda sp.	Bivalve	–	–	–	–	1	1
Class indeterminate		6	–	3	1	6	16
Total		**87**	**47**	**248**	**169**	**439**	**990**

(*Phaseolus vulgaris)* (*n*=1), berries and other fleshy fruits, grasses, tubers, and other plants have been identified at the site (Fecteau 1987; 1988; 1989).

Maize is not well represented at the Providence Bay site and its dietary contribution and production strategy at the site is unclear. Although an adequate growing season is present inland from the site, the soils of Manitoulin Island are poor and shallow (Chapman and Putnam 1971:166). The ethnohistoric literature from northern Lake Huron is equivocal, but there is a general sense that small plots of maize were planted in favoured spots, but often had to be harvested green; in other words, maize was cultivated, but did not comprise a dietary staple (Smith 1996:91-92, 148-150). Maize kernels are rare in the site assemblage and no cob fragments were identified. Only 12 percent of the 149 flotation samples (98 litres) from the site produced maize. In contrast, between 76 percent and 100 percent of samples produced maize in a select sample of Huron sites (Monckton 1992). The fact that 40 percent of the flotation samples produced fruit seeds suggests that conditions at the Providence Bay site were conducive to the preservation of botanicals. There is little evidence, therefore, to support an argument for wide scale production of maize at Providence Bay and it is possible that maize was mainly acquired in exchange relations with Huron/Petun people to the south (Smith 1996:266-270).

Subsistence remains indicate that the diet of the occupants of the Providence Bay site stressed red meat, fish, and wild plants and that plant domesticates were a minor component of the production strategy.

Stratum II Seasonality and Procurement Practices

The intensity of the Stratum II occupation, in

terms of material culture, features, and faunal remains, suggests that the site was occupied year-round. The houses, as manifested by post moulds with associated hearths, pits, and middens, indicate that the residents of the site had the domestic comforts to withstand winter weather at the locality. The palisade would have further protected the occupants from winter winds.

The faunal assemblage also suggests a year-round occupation, although there is no unequivocal empirical evidence to support this conjecture. The vast majority of mammals in the assemblage could have been hunted year-round, while the muskrat (*Ondatra zibethicus*), aquatic birds, passenger pigeon (*Ectopistes migratorius*), and turtles are available only in warm weather (Banfield 1974; Cook 1984; Godfrey 1986). The ruffed grouse (*Bonasa umbellus*), owl (*Strigidae* sp.), bald eagle (*Heliaeetus leucocephalus*), osprey (*Pandion haliaetus*), and common raven (*Corvus corax*) are year-round residents on the island (Godfrey 1986). Fish are available in the river and lake adjacent to the site at all times of the year but, like many mammals, certain fish species are more likely to have been exploited intensively in certain seasons.

The reconstruction of the seasonality of Upper Great Lakes occupations entails not only consideration of the availability of species but also has regard to procurement strategies, animal behaviour, the nutritional status of prey, and other such factors. The ethnohistoric literature of the Upper Great Lakes also provides a number of references to the seasonal exploitation of animals, although these tend to be culturally, temporally, and geographically disparate (Smith 1996:144-164). Through review of this literature, it is possible to develop a basic outline (Figure 3) of the favoured seasons of exploitation of major prey animals (Smith 1996:165). For each season referenced ethnohistorically, many favoured faunal and floral species have been identified at the Providence Bay site.

This same ethnohistoric literature is also useful as a source to reconstruct the possible procurement practices used to exploit the animal species identified at the Providence Bay site (Smith 1996:150-155). The numerically dominant group of animals at the site is sucker, especially white and longnose suckers.

Longnose (*Catostomus catostomus*) and white suckers (*C. commersoni*) are anadromous and dense runs of spawning suckers are observed annually in the Mindemoya River in early and mid spring. Sucker runs, during which "thousands may ascend a suitable stream, as many as 500 passing a point in five minutes" (Scott and Crossman 1973:540) were clearly exploited at the Providence Bay site. While there are few references to the exploitation of sucker in the ethnohistoric literature of the Upper Great Lakes, Lieutenant James Allen described their exploitation during the spring near Sault Ste. Marie in 1832 (Mason [ed.] 1958:164). The suckers identified at the Providence Bay site vary in size, and this variability suggests a procurement technique that was not size selective, such as seine nets or weirs.

Lake sturgeon (*Acipenser fulvescens*) is the most widely described target of the spring fishery in the Upper Great Lakes. Historical accounts (cf. Smith 1996:152-153) attest to the economic

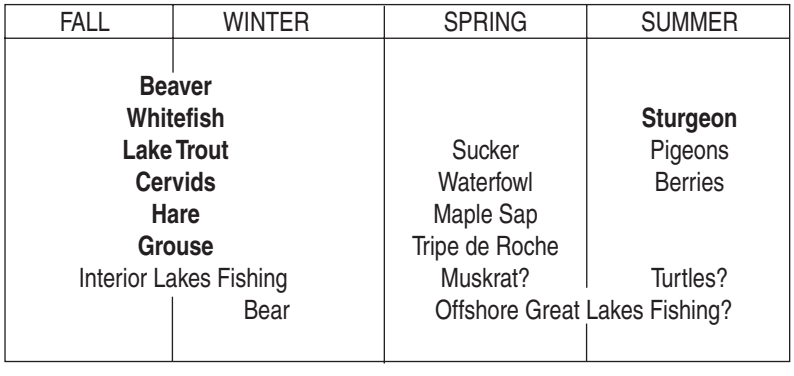

Figure 3. *Season of exploitation based upon ethnohistoric sources in the Upper Great Lakes region (Smith 1996).*

importance of this fishery. While many Late Woodland/contact period sites in the region, such as Hunter's Point (BfHg-3) (Molnar 1997; Prevec 1991, 1992, 1993), Juntunen (20MK1) (Cleland 1966), Marquette Mission (20MK82) (Smith 1985) Nyman (ClIf-11) (Burns 1976), Renard (CbHs-5) and Falls (CbHs-7) (Gordon 1978) produced large numbers of sturgeon elements, other sites, including Providence Bay, produced little evidence of intensive sturgeon exploitation. Lake sturgeon, like other spring spawners, such as yellow walleye (*Stizostedion vitreum*), yellow perch (*Perca flavescens*), basses (*Micropterus* sp.), and bullheads (*Ictaluridae* sp.), are present in relatively small numbers at the Providence Bay site (Table 3). Other spring foods, such as waterfowl and muskrat, and summer foods, including pigeons, turtles, and berries, are all present in the Providence Bay archaeological record, thus supporting a warm weather occupation.

In cold weather months hunting, trapping, and the fall fishery for lake trout and whitefish are the dominant subsistence activities described in the ethnohistoric literature (Smith 1996:150-152, 154-155) and the major species described are all identified in the Providence Bay faunal assemblage (Figure 3; Tables 1-3).

Gill net technology for exploiting fall spawning fish is well documented in the ethnohistoric literature (cf. Cleland 1982:762-763) but it is difficult to demonstrate archaeologically. Salmonid (including lake trout and whitefish) cranial elements are notoriously fragile and more susceptible to destructive taphonomic processes than are the cranial bones of fish from other zoological families (Butler and Chatters 1994; Lubinski 1996).

Whitefish are clearly an important species at the Providence Bay site. After A.D. 800, whitefish were traditionally targeted with gill net technology at certain prime localities in the Upper Great Lakes (Cleland 1982). According to Cleland, large intensive occupations were established near whitefish spawning shoals where the exploitation of fall spawning fish required intensive labour that was, in turn, rewarded by a reliable store of frozen fish for winter use. Certainly, the size and intensity of occupation at the Providence Bay site is consistent with Cleland's prediction about Late Woodland settlement and the Inland Shore Fishery.

Whitefish cranial elements from the primary author's sample indicate a consistent live size of 400-450 mm (approximately 16-18 inches) estimated from comparisons with reference specimens of known size. This size range would suggest a gill net mesh size of 7.5-10 cm (3-4 inches) (McCombie and Fry 1960). Since gill nets are highly selective in terms of fish size, the size range of the whitefish sample supports the use of gill nets. The large number of common loon in the Providence Bay faunal sample may also be considered indirect evidence of the use of nets. At several other Upper Great Lakes sites, including Juntunen (20MK1) (Cleland 1966), Scott Point (20MK22) (Martin 1982), and Shawana (BkHk-1) (Prevec 1988), where large numbers of whitefish are identified, loon is also well represented. McPherron (1967:196) suggests that loon, feeding on fish caught in gill nets would also have been caught therein.

The size of lake trout elements in the Providence Bay faunal sample indicates the exploitation of large individuals; Smith (1989) estimates a live length of 635-650 mm (24-26 inches) based upon comparisons with reference specimens of known size. This size range, as well as the relatively small number of lake trout elements in the assemblage, suggests that lake trout were not captured with whitefish in gill nets, but may have been exploited by hook and line or spearing, as is described in the ethnohistoric accounts from the Straits of Mackinac (Cleland 1982:762-764; Smith 1985, 1996). It is notable that, while lake trout were formerly very abundant in Lake Huron, there are no lake trout spawning grounds directly offshore from Providence Bay (Smith 1968). Lake trout are generally deepwater species, preferring cold water; they are most easily caught near the surface (<60 feet) in the fall through early spring (Scott and Crossman 1973:225).

Stratum II Intra-Site Community Patterning

A consideration of the spatial distribution of features

and faunal species among units at the Providence Bay site suggests that certain areas of the site may have served different economic functions and that differences in activities in terms of animal procurement, processing and use may be identified. There is evidence to support the hypothesis that certain units reflect communal activities, such as ritual and the processing of animal species procured in a large group effort, while other units at the site reflect household level procurement and subsistence activity. To test this hypothesis, the features and faunal remains recovered from sheet middens (Units 6/8 and 7B) were compared with the houses and their adjacent middens (Units 1, 2/4, 3, and 11) at the site with reference to the nature of features, overall bone density, and relative density of important subsistence species.

The post moulds, pits, and hearths associated with Unit 6/8, which was most extensively excavated, differ from the feature configurations associated with houses. In Unit 6/8, most hearths were linear, often with two to four post moulds at their ends. These have been interpreted as evidence of fish smoking racks (Conway 1988:99). Storage pits from Unit 6/8 commonly contain copious amounts of fish bone. In both Units 6/8 and 7B, cultural material was deposited as a sheet or veneer midden. In Units 1, 2/4, 3, and 11, post moulds were relatively closely spaced and aligned in a linear pattern. Pits and hearths associated with these houses were generally oval in plan and basin-shaped in profile and produced only small amounts of fauna and artifacts relative to features associated with sheet middens (Conway 1988).

Other characteristics of Units 6/8 and 7B suggest that these areas of the site differ from houses. Only Units 6/8 and 7B produced evidence of ritual bundle burials of animals. In Unit 6/8, the bundle burials of five dogs (*Canis familiaris*), one loon, and three beaver were excavated; from Unit 7B, three dog bundle burials and a double eagle (probably bald eagle) burial were present. The young dog remains (most less than one year in age) exhibited transverse cut marks of the ventral surface of cervical vertebrae 2, 3, and/or 4, indicating that their throats were slashed. They were buried in relatively narrow tubes of a perishable material, possibly birch bark, and were, for the most part, complete individuals (Smith 2000). Unit 2/4 produced the only evidence of an artifact associated with a house that may represent the ideological realm; an incomplete black bear mandible which is stained with copper was recovered from the edge of a hearth in House 2 (Conway 1988:48).

The units representing sheet middens and houses were compared with reference to the overall density of faunal remains. A difference in the faunal density reflecting non-ritually buried animals lends support to the notion that the sheet middens differed from houses in the deposition of subsistence related fauna. Because there is variability in excavation area for each unit, the data are standardized by calculating bone density (NISP/m^2).

There does indeed appear to be a difference between the density of fauna in sheet middens (Units 6/8 and 7B), where fauna was recovered in very high densities (>250 NISP/m^2) and in houses (Units 1, 2/4, and 3), where fauna was found in relatively low densities (<100 NISP/m^2) (Table 7). Units 5 and 7A produced a low density of fauna, supporting Conway's (1988:87, 136) suspicions that these areas of the site represent, or are associated with, household activities. The high density of fauna in Unit 10 suggests that this area is a midden and is possibly a northwest extension of the deposits encountered in Unit 6/8.

A comparison of the density (NISP/m^2) of important categories of animal species also supports

Table 7. *Density of faunal specimens from Stratum II at the Providence Bay site.*

Unit	NISP	m^2 Excavated	Density
3	1,188	13	91.4
2&4	964	16	60.3
11	648	–	–
1	95	2	47.5
6&8	23,621	43	549.3
7A	173	4	43.3
7B	4,099	16	256.2
9	2,897	–	–
5	200	5	40.0
10	2,884	8	360.5
Test Pits	1,034	–	–
Total	**37,803**	**107**	**310.5**

the hypothesis there are important differences between the sheet middens and the houses (Figure 4). Sucker, whitefish, and lake trout are all well represented in Units 6/8 and 7B but are not common in houses. Beaver is the only mammal that is well represented in Units 6/8 and 7B and less well represented in houses. In the houses, spring-spawning fish such as walleye/perch, snowshoe hare (*Lepus americanus*), other small mammals, and most importantly in terms of subsistence contribution, cervids are well represented but are found in relatively low density in Unit 6/8 (Figure 4). Unit 7B more closely mirrors the pattern of houses in this regard and this observation supports Conway's suggestion that "it is very likely that a house is located on the terrace above the swale" (1988:144).

The differences between the sheet middens and the houses at the Providence Bay site may therefore indicate differences in strategies of procurement and processing of certain animals. The sheet middens may reflect the community-wide processing of intensively harvested fish. High numbers of suckers are consistent with spring season weir or seine netting and high numbers of whitefish are consistent with fall season gill netting. Both fishing procurement strategies are intensive in terms of labour and constrained in terms of the time period of congregation related to spawning.

The high proportion of beaver in the sheet middens is more difficult to interpret. It might be expected that beaver would be trapped by individuals rather than exploited on a communal level. If some of the beaver represented in the Providence Bay site faunal assemblage were received in an exchange network from more northern nations, however, it is not surprising to find their remains more commonly associated with a ritual and communal activity area at the site (Smith 1996:267).

Household procurement strategies appear to target snowshoe hare and other small mammals as well as cervids since these species are well represented in houses and poorly represented in Unit 6/8.

Conclusions

Providence Bay is an important site in any synthesis concerned with the late precontact/early contact period in the Upper Great Lakes; the

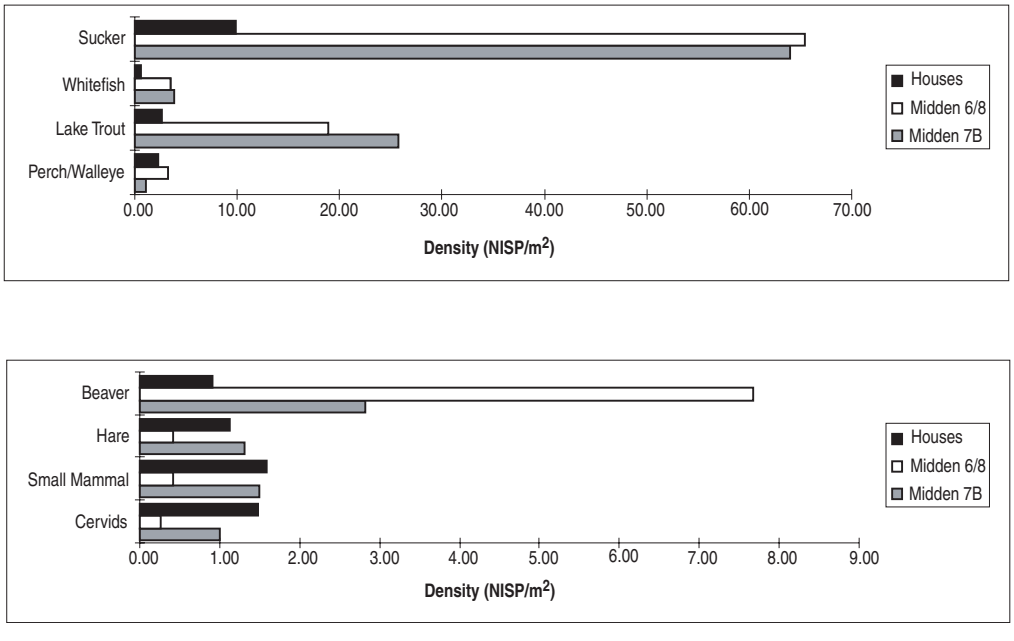

Figure 4. *Density of select faunal taxa in houses and middens at the Providence Bay site.*

material culture, settlement data, and evidence of ritual behaviour are only briefly summarized here. This analysis focuses on the extensive faunal assemblage.

This analysis demonstrates that faunal remains may contribute significantly to an understanding of past behaviour. The faunal assemblage provides an empirical database for reconstructing subsistence preferences and seasonal occupation. At Providence Bay, suckers in the spring, whitefish in the fall, beaver, cervids, and hare in the winter, and a variety of small mammals, birds, turtles, and other fish species throughout the warm season were important sources of food. The faunal assemblage, high density of artifacts and substantial housing all point toward a year-round occupation of the site, at least by a portion of the population.

Procurement strategies for fish and terrestrial species are also accessible through the analysis of faunal remains using ethnohistoric and ethnographic models of alternative approaches to the exploitation of important species. It is suggested that suckers were intensively exploited using weir or seine net technology and that whitefish were captured with gill nets. Hook and line and/or spearing were probably both employed for a variety of fish species. Hunting was undertaken using snares and traps for both cervids and small animals.

The ethnohistoric and ethnographic documents are mute, however, with reference to the internal spatial arrangement of communities. Comparisons of faunal density and the differences in the distribution of major categories of animals across the site are shown to be of great utility in identifying activity areas and predicting activities in areas of the site that have not been fully excavated. This analysis has shown that spatial differences in fauna may reflect differences in the organization of production and processing between community-wide and household level economic activities. Community level activities suggested by this analysis include the processing of intensively harvested fish, rituals as evidenced by animal burials, and processing of beaver possibly received in exchange networks.

Acknowledgments. The authors thank *Ontario Archaeology* guest editor Dr. Max Friesen for his patience and assistance in the production of this paper and two anonymous reviews for their insightful comments. We are grateful to Thor Conway for his excellent work at Providence Bay and for providing us with the opportunity to analyze the faunal assemblages from this exciting site. We are indebted to the Department of Anthropology, University of Toronto that supports the Howard G. Savage Faunal Osteoarchaeology Laboratory and The Michigan State University Museum for providing access to comparative collections and facilities. We also thank Kent Smith, University of Michigan-Flint, for his excellent maps. We acknowledge the financial support of the Ontario Heritage Foundation for partially funding this study. Finally, we gratefully acknowledge the influence of the late Dr. Howard G. Savage, our friend, mentor, teacher and so much more.

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