Variability in Neutral Iroquoian Subsistence: A.D. 1540-1651

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This paper adds information on the subsistence of the pre-contact and post-contact Neutral Iroquoians to that published by Prevec and Noble in 1983. Using zooarchaeological research completed since that publication, some of their findings are supported and some changes to their conclusions are indicated. Trends in Neutral faunal utilization are updated. Explanations for the variability observed in the faunal samples from 13 Neutral Iroquoian sites are offered, with the most consideration given to microenvironmental differences in the sites' locations, and to changes over time, particularly the coming of Europeans to the region.

Introduction

In 1983, Rosemary Prevec and William Noble (1983) published a synthesis of faunal analyses of six Neutral sites, dating from ca. A.D. 1540 to 1651. Since their publication, several additional sites have been excavated and more zooarchaeological studies have been completed. It is now possible to add to Prevec and Noble's information. The purpose of this paper is to increase our knowledge of the use of animals by the pre-contact and post-contact Neutral Iroquoians of southern Ontario by examining 13 Neutral zooarchaeological samples and attempting to explain their similarities and differences.

La nation neutre was so named by Samuel de Champlain (Biggar 1922-1936:3:99-100) in 1615 because, at that time, these peoples maintained peaceful relations with their neighbours, the Huron to the north and the Five Nations Iroquois to the south and east. At the time of European contact, the Neutral peoples were concentrated at the western end of Lake Ontario and north of the eastern half of Lake Erie, in the Niagara Peninsula, as reported by various Jesuits (J. Lalemant on Brébeuf and Chaumonot in Thwaites 1896-1901:21:189, 191; Bressani in Thwaites 1896-1901:38:235, 237; and Ragueneau in Thwaites 1896-1901:33:61, 63). However, some earlier archaeological sites attributed to the Neutral Iroquoians have been located west of the Grand River and as far east as across the Niagara River in New York State (Lennox and Fitzgerald 1990:405-406). All but one of the 13 sites considered in this paper are situated just west of Lake Ontario in the Crawford Lake area, which is located about 50 km west of Toronto (Figure 1).

The dominant physiographic feature in this area is the north-south running Niagara Escarpment, but the region is also influenced by its proximity to the Great Lakes, and numerous rivers and large swamps. This area is at the northern edge of the Carolinian biotic zone, which is characterized by oak-hickory forests and is a region of very diverse plant and animal life (Dice 1943). Situated within the Deciduous Forest region (Rowe 1972), it contains many nut-producing trees, fruit trees, and a few coniferous stands (Finlayson 1998:2:Table 2.1.1). Cedars are common in the wet areas. Berries and other edible plants are also found here in abundance and diversity, supporting a wide variety of animal life (Finlayson 1998:2:Tables 2.1.2-2.1.5).

Archaeology in the Crawford Lake area has revealed an intensive and complex occupation of the area by Iroquoian peoples between approximately A.D. 1000 and 1650 (cf. Wright 1966, 1992; Finlayson 1998). The initial Iroquoian occupants of the area are thought by William Finlayson (1998) to have been "proto-Huron", after which "proto-Neutral", Middleport peoples moved into the area. By the seventeenth century, French missionaries encountered only Neutral people living in this region. Several historic Neutral sites have been excavated by Noble, who has consistently considered faunal remains to be an important part of the archaeological record (Stewart 1993:11).

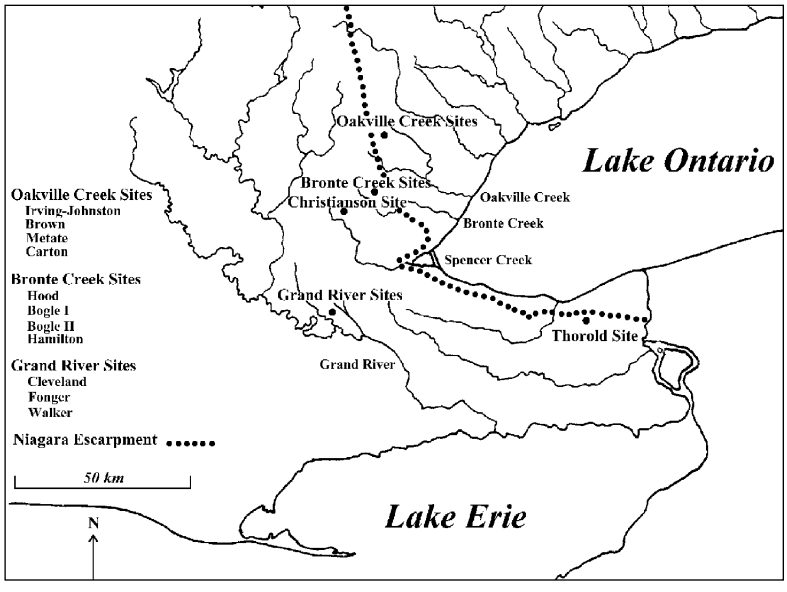

Figure 1. *The location of the sites mentioned in text.*

A Summary of Prevec And Noble's Article

Prevec and Noble (1983) based their "Historic Neutral Iroquois faunal utilization" study on remains from "the three large towns of Thorold, Walker and Hamilton, and from the three smaller villages of Cleveland, Fonger and Christianson" (Prevec and Noble 1983:43). The most northerly of these was the Hamilton site (AiHa-5), which is located in the southwest corner of the Crawford Lake area on a branch of the Bronte Creek drainage system (Figure 1). Christianson (AiHa-2) is less than five km south of the Hamilton site, on the Spencer Creek system that runs through the Beverly Swamp (Fitzgerald 1982:Figure 4). Cleveland (AhHb-7), Fonger (AhHb-8), and Walker (AgHa-9) are all short distances progressively farther south on tributaries of the Grand River. Thorold is located farther away, about 75 km to the east of Walker (Prevec and Noble 1983:Figure 1). The dates attributed to these sites by Prevec and Noble (1983) are as follows: Cleveland, early proto-historic, ca. A.D. 1540; Fonger, historic, ca. A.D. 1600-1620; Christianson, historic, A.D. 1615-1630; Thorold, historic, A.D. 1615-1630; Walker, historic, A.D. 1620-1645; and Hamilton, late historic, A.D. 1635-1651 A.D.

At most of these sites, mammalian remains were found to predominate, as indicated by NISPs and fish ranked above birds (Table 1). The exceptions to this pattern are Thorold and Hamilton, where this order was reversed (Table 1). Reptiles and amphibians were identified only infrequently, although, at Thorold, reptiles formed six percent of the faunal sample. Invertebrate remains were often so common that their numbers were second only to those for mammals at the four earliest sites. Prevec and Noble (1983:Table 2) presented percentages based on NISPs for the five most commonly represented mammals only. These were white-tailed deer (*Odocoileus virginianus*), racoon (*Procyon lotor*), beaver (*Castor canadensis*), *Canis* sp., and grey squirrel (*Sciurus carolinensis*). The most frequently identified mammalian remains from all six sites were from white-tailed deer. Deer accounted for over 60 percent of the remains at Hamilton and Cleveland, and over 70 percent at Walker and Fonger. But at Christianson, deer comprised only 41.5 percent, and at Thorold only 33.7 percent. Racoons ranked second with 17 percent at Hamilton, but were third at Cleveland and Walker, and fourth at Christianson and Fonger where their contribution reached a low of 2.8 percent. Beaver was second at Fonger and Christianson, where it reached a high of 19 percent and fourth at Cleveland and Walker. Beaver

Table 1. *Dates and class percentages for 13 Neutral sites, based on NISP.*

Class	Cleveland (A.D.1540)[1]	Irving-Johnston (A.D. 1563-1683)	Metate (A.D. 1563-1683)	Fonger (A.D. 1600-1620)[1]	Carron (A.D. 1613)	Christianson (A.D. 1615-1630)[1]	Thorold (A.D. 1615-1630)[1]	Walker (1620-1645)[1]	Brown (A.D. 1630)	Hood (A.D. 1630-1341)[2]	Bogle I (A.D. 1630-1341)[3]	Hamilton (A.D. 1635-1651)[1]	Bogle II (A.D. 1640-1651)[3]
Mammal	73.7	93.7	92.8	82.4	93.8	69.2	55.0	73.2	97.5	91.1	71.7	75.2	75.0
Bird	0.4	2.1	2.1	1.2	0.7	5.1	15.7	8.4	1.1	1.6	4.2	12.7	1.1
Fish	4.8	2.5	4.5	6.8	1.5	7.4	10.0	15.4	0.8	5.0	10.1	7.3	3.0
Reptile	0.7	0.5	0.6	0.7	0.3	1.7	6.0	0.6	0.5	0.1	–	0.9	0.1
Amphibian	0.4	–	–	0.1	0.1	2.1	0.3	0.9	–	0.3	–	0.7	–
Invertebrates	20.1	1.2	–	8.8	3.7	14.5	13.0	1.5	0.1	1.8	13.9	3.2	20.8
TOTAL (%)	**100.1**	**100**	**100**	**100**	**100.1**	**100**	**100**	**100**	**100**	**99.9**	**99.9**	**100**	**100**

Sources: [1]Prevec and Noble 1983; [2]Lennox 1984a; [3]Lennox 1984b.

was fifth at Hamilton and Thorold, where it accounted for less than one percent of the remains. *Canis* sp. remains formed the highest percentage (12.1) at Cleveland where they ranked second. They were third at Fonger, Christianson, and Thorold, fourth at Hamilton, and fifth at Walker where their contribution was 1.9 percent. *Canis* sp. identifications possibly included both wolf (*C. lupus*) and domestic dog (*C. familiaris*), but it will be assumed that most were dog because very few positive wolf identifications were made at any of the 13 sites considered in this paper whereas dog identifications were common. Finally, grey squirrel remains ranked second at both Thorold and Walker. At Thorold, they were almost as common as deer remains, comprising 33.5 percent of the assemblage. Grey squirrel was third at Hamilton and fifth at the remaining three sites. At Cleveland and Christianson, their contributions were 0.8 and 0.9 percent respectively.

Prevec and Noble (1983) noted some patterns in these rankings. Deer were always first regardless of the age or size of the site. "Racoons normally [made] up a second favoured animal and they [were] found in larger numbers on the later sites, probably as a result of increased fur trade following contact with the French" (Prevec and Noble 1983:45). Surprisingly, beaver remains did not exhibit a similar increase. Prevec and Noble (1983) admitted this pattern was difficult to explain, but suggested that it might reflect less access to beaver, different pelt handling practices between large and small sites, or different attitudes towards French trade. Grey squirrel pelts appeared to have been in demand after A.D. 1615. Squirrel proportions increased from last place in the earliest, smaller villages to second or third place in the later, larger, sites. The large number of squirrel remains at Thorold were attributed to this site being located where this species was particularly abundant. Thus, the strongest evidence in the archaeological assemblages for changes in fur-bearer procurement patterns is not associated with beaver, but rather with grey squirrel and possibly racoon. Conversely, *Canis* sp. remains decreased over time both in percentages and rankings but Prevec and Noble did not comment on this trend.

There were far fewer fish bones from the sites within Prevec and Noble's sample. Counts were not provided for fish, but Prevec and Noble (1983:44) stated that "coarse species such as catfish (*Ictaluridae* sp.), sucker (*Catostomidae* sp.) and freshwater drum (*Aplodinotus grunniens*) prove popular". Other sources give more details. At Christianson, lake sturgeon (*Acipenser fulvescens*) ranked third after catfish, including those more definitely identified as brown bullhead (*Ictaluris nebulosus*), and sucker (Fitzgerald

1982:27). Drum was tied in the last spot with only one specimen represented. At Walker, suckers dominated the sample followed by catfish (Rick and Cumbaa [1976], as reported in Wright [1981:169-170]. Sauger/walleye (*Stizostedion* sp.) was third followed by various bass. Freshwater drum was common at Walker, where lake sturgeon and whitefish (*Coregonus* sp.) were also frequent. At Hamilton (Pihl [1977a] as reported in Lennox [1981:344]), the fish remains were dominated by catfish, particularly brown bullhead, but remains of suckers were fewer than those of walleye and no lake sturgeon bones were identified. Bass, particularly largemouth bass (*Micropterus salmoides*) ranked fourth.

More attention was paid to the bird remains by Prevec and Noble (1983:45-46). Passenger pigeon (*Ectopistes migratorius*) ranked first at five sites. The exception was Cleveland where it was not identified. Wild turkey (*Meleagris gallopavo*) ranked first at Cleveland and second at all the other sites (Prevec and Noble 1983:44). Prevec and Noble (1983:45) noted that "fish and bird elements occur in higher proportions on the large town sites [2-6 ha] than on the smaller village settlements [0.4-2 ha]". They also commented on the dramatic increase in passenger pigeon, wondering if these birds might have become a trade commodity between A.D. 1615 and 1651 (Prevec and Noble 1983:45).

Prevec and Noble also compared bone artifacts from Neutral and Petun site faunal samples. Some of their comments and conclusions will be incorporated later in this paper. Now, seven additional sites and their faunal samples can be considered and then compared to those reported by Prevec and Noble.

Seven Additional Sites

The new data presented in this paper are derived primarily from excavations over the past 25 years in the Crawford Lake area by Finlayson (1998). Emphasis will be given to zooarchaeological samples recently analysed from three Neutral villages in the northern section of the Crawford Lake area: Irving-Johnston (AjGx-27) (Stewart and Finlayson 1998), Metate (AjHa-19) (Stewart 1999) and Brown (AjGx-10) (Stewart 1999). These are given prominence because all of their available faunal samples have been identified by myself, which allows for consistency, and because the number of identified zooarchaeological remains from these sites is greater than that from most of the others. Other published summaries of faunal reports used in this review are those of Deborah Pihl (1977a) cited in Lennox (1981, 1984b), Heather Nicole (1979) cited in Lennox (1984a), Rosemary Prevec (1980) cited in Fitzgerald (1982), Anne Rick and Stephen Cumbaa (1976), cited in Wright (1981), and Elizabeth Silieff and A. Rick (1976), cited in Wright (1981). Unpublished reports used are those by Becky Carter (1980), Martin Cooper (1980), Stan Freer (1980a, 1980b), Anna Leventhal (1989), Susan Langley and Beverley Smith (1980), Elizabeth Marchand (1971), E. Marchand and Irene Knutson (1972), Emma Smith (1991) and Rosemary Prevec (1981).

The Oakville Creek Sites

Of the three Oakville Creek sites emphasized in this paper, Irving-Johnston (AjGx-27) and Brown (AjGx-10) are located below the Niagara Escarpment whereas Metate (AjHa-19) is above it (Finlayson 1998:1:333, 334, 358). All three are on tributaries of the northernmost of the two main branches of Oakville (Sixteen Mile) Creek (Figure 1). A fourth village, Carton (AjGx-3), is located below the Escarpment, beside a tributary of the southernmost of the main branches of Oakville Creek.

The Irving-Johnston village is located 9.3 km north of Crawford Lake and 25.4 km north of Lake Ontario, on a limestone plain with a steep break in slope towards a tributary of Oakville Creek (Finlayson 1998:1:333). In 1992, Mel Brown, under Finlayson's direction, excavated 53 one-metre squares and two 50 by 100 cm test units in one of three middens that had been previously tested. Brown's excavations uncovered two longhouses, one of which was superimposed over a double palisade, a pattern suggesting village expansion. Thus, Irving-Johnston is interpreted as a large village of approximately four hectares. Rim sherd seriation and annual varves

in Crawford Lake (Byrne and Finlayson 1998) have been used to date this site to ca. A.D. 1563-1583 (Finlayson 1998:1:375). The Irving-Johnston excavations, which entailed screening soils through a six millimetre mesh, produced 8,557 faunal specimens, primarily from the middens (Stewart and Finlayson 1998). This total includes 4,126 vertebrate identifications completed by Tina Burns (T. Burns, personal communication 1980; J. Burns, personal communication 1998). I re-examined those remains and identified the remaining 4,431 specimens.

The Metate site was discovered in 1990, 13.5 km north of Crawford Lake and 32 km north of Lake Ontario (Finlayson 1998:1:88, 358), in the northwestern corner of the Crawford Lake region. At Metate, 76 one-metre squares were excavated in three middens, and the end of a longhouse was found beneath one of these middens. Soil was screened through 6 mm mesh. The site "appears to encompass at least 1.5 ha" (Finlayson 1998:1:358). Based on coefficients of similarity in artifact styles, "Metate is most closely related to Irving-Johnston and is probably contemporaneous with it" (Finlayson 1998:1:361). Their artifact styles and similar lack of European trade goods indicate a ca. A.D. 1563-1583 date (Finlayson 1998:1:375). A total of 4,049 faunal remains from the Metate site have been analysed, including the 628 specimens originally identified by Emma Smith (1991).

The Brown site (AjGx-10) is located 13.8 km north of Crawford Lake and 29.3 km. north of Lake Ontario, on a drumlinized till plain. Most of the faunal remains recovered from the site came from 30 five-foot squares in two middens. "An additional 90 five-foot squares and parts of 11 others were excavated ... and a palisade was recorded" (Finlayson 1998:1:334). Surface collections made at Brown suggest that it is the smallest of the three sites considered herein, extending over slightly more than one hectare (Finlayson 1998:1:336). According to Finlayson, Brown was one of two groups of sites derived from the Irving-Johnston population. Several European artifacts, including numerous blue glass beads, helped date Brown to ca. A.D. 1630 (Finlayson 1998:1:Table 1.7.1). The Brown faunal assemblage totals 3,876 specimens. Marchand (1971) examined 520 of these (Finlayson 1998:870); Carter (1980) identified 539, and Cooper (1980) studied 361 (Carter 1980:10). All were re-examined for this paper by Emily Pool and Ashley Sprague under my supervision.

The Carton site is located 25.2 km northwest of Lake Ontario and 6.5 km north of Crawford Lake and is adjacent to a marsh that abuts the Escarpment. This site has been known since the late 1800s when an ossuary containing about 300 individuals and some copper rings and iron axes was investigated (Hunter 1898). In 1967-1968, Dean Axelson (1970:5)excavated an ossuary close to the village site that contained about 250 individuals. At least 81 crania were exhumed, in addition to brass rings, bracelets and beads, glass trade beads and some iron pieces (Molto 1983:88, 95). In 1988, Finlayson excavated 39 one-metre squares in a central midden. A further 58 test squares allowed an estimate of 2.5 hectares for the size of this village (Finlayson 1998:1:87, 1998:3:Figure 3.5.35). Based on ceramic seriation and European artifacts, he placed Carton midway between Irving-Johnston and Brown, at ca. A.D. 1613 (Finlayson 1998:1:372-375). Leventhal (1989) examined 1,755 faunal specimens from Carton's central midden, identifying 307 of these beyond the class level. This figure meets the minimum number suggested as sufficient for subsistence interpretations by Amorosi et al. (1996:134) but is below the 500 recommended by Howard Savage for Ontario sites. These identifications were confirmed or corrected for this paper. Of the four sites, Carton had the fewest represented species and this likely reflects, in part, the low total number of specimens examined.

The Bronte Creek Sites

Three additional Neutral sites with identified faunal samples are located just northeast of the Hamilton site, on a tributary of Bronte Creek. From north to south, these are Hood (AiHa-7), Bogle I (AiHa-10), and Bogle II (AiHa-11) (Figure 1). The Hood village, bounded on its north and east sides by Bronte Creek, has been known archaeologically since the late 1800s. This

heavily palisaded village, which had at least 15 houses and central as well as peripheral middens, extended over approximately 2.7 hectares. Lennox dates Hood to ca. A.D. 1640. Over 12,000 faunal remains were submitted to D. Pihl for analysis and a summary of her work appeared in Lennox's (1984b) site report. Some of these remains were from one shallow midden, but most apparently were from house features or the areas between houses (Lennox 1984b:133-134,181). Thus, the sample of 9,070 specimens identified to class has a different intra-site provenience from the other midden samples considered in this paper.

Bogle I and Bogle II were excavated by Lennox (1984a) as well. At all three of these sites, Lennox removed the topsoil with a bulldozer and shovels but trowelled features, including midden deposits, and sifted the back-dirt through six millimetre screen (Lennox 1984a:187, 1984b:7). Unlike the other sites discussed in this paper, Lennox (1984a:184)considered Bogle I and Bogle II to be hamlets or satellite villages, rather than principal villages because they encompass only 0.3 hectares or less. Bogle I comprises a total area of about 2,900 square metres, about a third of which was excavated (Lennox 1984a:189); Bogle II is slightly smaller and about a fifth of it was excavated (Lennox 1984a:227). Ethnohistorically, "little hamlets of seven or eight cabins built in various parts convenient for fishing, hunting, or agriculture" were described by Daillon (Sagard 1866:3:799). Bogle I appears to have been occupied contemporaneously with Hood or ca. A.D. 1630-1641, whereas Bogle II was slightly later and contemporaneous with Hamilton, ca. A.D. 1640-1651 (Lennox 1984a: 262-263).

The Bogle I and Bogle II faunal remains were examined by Nicole (1979) and her findings were summarized in Lennox (1984a:223-226, 254-256). The faunal assemblage from Bogle I totalled 338 specimens, however, only 237 were analyzable (Lennox 1984a:225). A larger sample of 1,468 remains was available from Bogle II but "only 120 specimens could be identified beyond the class level" (Lennox 1984a:254). Again, as was true of Carton, these are small samples.

In sum, the sites under consideration range in date from Irving-Johnston and Metate, ca. A.D. 1563 to 1583, to the dispersal of the Neutrals ca. A.D. 1651 (Figure 2) and so fall within the time range considered by Prevec and Noble (1983). Because three of these sites pre-date A.D. 1615, they fill a gap in the sequence of sites considered by Prevec and Noble. The inclusion of the Bogle I and Bogle II sites expands the size ranges of the sites being considered.

Comparisons of the Faunal Samples

Class Frequencies

In general, all of the classes were represented on most of the sites. As can be seen in Table 1, mammalian remains dominated the faunal assemblages from all 13 sites. For those sites for which it is known that all of the excavated faunal remains were identified (i.e., Irving-Johnston, Brown, Metate and Hood), the mammalian proportions are all over 90 percent. Although mammals dominated, birds, fish and reptiles were represented, as well, on all but one of these sites; there were no reptiles at Bogle I. For ten sites, fish remains formed a higher percentage of the assemblages than bird bones, but at three (Irving-Johnston, Brown and Carton), the differences between fish and bird NISPs were less than one percent. Whereas a few reptile pieces were found at all of the sites, except Bogle I, amphibian remains were not recorded at four sites and formed less than one percent at eight others; only at Christianson were they more common and there, amphibian out-ranked reptilian remains. The greatest variety in proportions was found for the invertebrates. At six sites (Cleveland, Fonger, Christianson, Carton, Bogle I and Bogle II), invertebrates ranked second to mammals but at others, invertebrates were absent (Metate) or they were very infrequent (Walker, Irving-Johnston, Brown, and Hood).

Mammal Frequencies

In addition to demonstrating the predominance of mammals at all 13 sites, one of the contributions of the present research is the great increase in the number of mammalian species that were

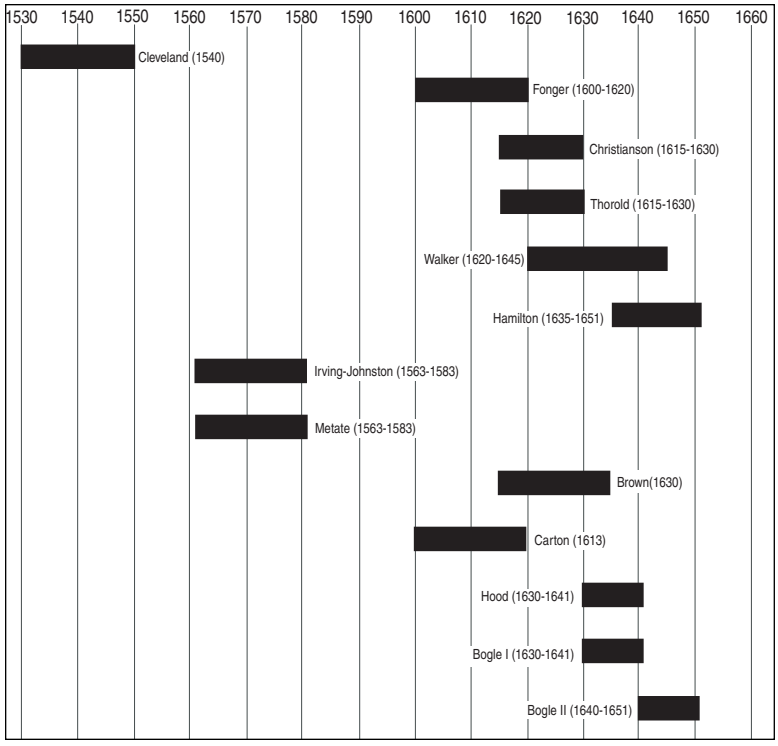

Figure 2. *Chronology of the 13 Neutral sites.*

apparently exploited by Neutral Iroquoians. As can be seen from Table 2, at least 28 species are represented, excluding European domestic mammals. Furthermore, the rankings of the mammalian species by NISP are very similar among these sites. All had remains of white-tailed deer, dog, black bear (*Ursus americanus*), and racoon. Eastern chipmunk (*Tamias striatus*) remains were found on seven sites and when the two small sites (Bogle I and Bogle II) are excluded, beaver, woodchuck (*Marmota monax*), and wapiti (*Cervus elaphus*) can be added to the list of mammals consistently found on these sites. While a richness of species is typical, diversity is not as great (use of these terms follows Cruz-Uribe [1988] and Meltzer et al. [1992]). Rather there is good evidence for preferences for some species and most important among these is white-tailed deer.

Deer remains clearly predominated, especially when the figures for those specimens identified to genus *Odocoileus* are added to those recognized to species (*O. virginianus*). Because white-tailed deer is the only species of the genus *Odocoileus* native to eastern Canada (Peterson 1966:317-334), it can be assumed that those specimens recognized to this genus only were white-tailed deer. The Crawford Lake area is known for its high densities of deer compared to other regions of Ontario. In 1626, Daillon (Sagard 1866:806) saw an "incredible number of deer" when he was visiting the Neutrals and Sagard, too, reported that deer were very plentiful in this region (Wrong 1939:225). Likely most of the zooarchaeological remains identified as Artiodactyla are white-tailed deer too, although some could be wapiti. Prior to their extinction by 1850, the eastern wapiti was widely distributed in southern Ontario (Peterson 1966:321) and wapiti specimens were identified, although in much lower numbers than those of white-tailed deer, on all of these sites, except Bogle II.

Among the sites Prevec and Noble considered, deer remains formed less than half of the mammalian remains in the contemporaneous Christianson and Thorold sites but ranged from 61.4 (Hamilton) to 72.0 (Fonger) percent on the other sites (Prevec and Noble 1983:44). Combining the figures for *Odocoileus* and *O. vir-*

Table 2. *Mammals from seven Neutral sites in the Crawford Lake area.*

		Irving-Johnston		Metate		Carton		Brown		Hood[1]		Bogle I[2]		Bogle II[2]	
Scientific Name	**Common Name**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Odocoileus virginianus	White-tailed Deer	887	52.2	429	38.4	133	64.9	877	58.0	1693	75.2	30	58.8	24	36.4
Odocoileus sp.	Deer sp.	282	16.6	253	22.6	4	2.0	103	6.8	–	–	–	–	–	–
Castor canadensis	Beaver	110	6.5	175	15.7	18	8.8	166	11.0	217	9.6	–	–	5	7.6
Canis sp.	Dog or Wolf	97	5.7	64	5.7	7	3.4	136	9.0	96	4.3	10	19.6	8	12.1
Ursus americanus	Black Bear	77	4.5	56	5.0	21	10.2	77	5.1	58	2.6	1	2.0	9	13.6
Canis familiaris	Domestic Dog	69	4.1	16	1.4	2	1.0	55	3.6	18	0.8	1	2.0	1	1.5
Cervus elaphus	Wapiti	64	3.8	27	2.4	1	0.5	7	0.5	8	0.4	1	2.0	–	–
Sciurus carolinensis	Grey Squirrel	25	1.5	15	1.3	–	–	–	–	2	0.1	–	–	–	–
Procyon lotor	Racoon	14	0.8	6	0.5	4	2.0	39	2.6	74	3.3	2	3.9	9	13.0
Tamias striatus	Eastern Chipmunk	13	0.8	6	0.5	9	4.4	2	0.1	7	0.3	1	2.0	1	1.5
Canis lupus	Timber Wolf	11	0.6	1	0.1	–	–	–	–	4	0.2	–	–	–	–
Marmota monax	Woodchuck	7	0.4	25	2.2	1	0.5	7	0.5	8	0.4	–	–	1	1.5
Lepus sp.	Rabbit sp.	6	0.4	–	–	–	–	–	–	–	–	–	–	–	–
Ursus sp.	Bear sp.	5	0.3	14	1.3	–	–	3	0.2	–	–	–	–	–	–
Vulpes/Urocyon	Fox sp.	4	0.2	–	–	–	–	–	–	4	0.2	–	–	–	–
Alces alces	Moose	4	0.2	4	0.4	–	–	7	0.5	–	–	–	–	–	–
Bos taurus	Domestic Cow	3	0.2	1	0.1	–	–	8	0.5	–	–	–	–	–	–
Ondatra zibethicus	Muskrat	3	0.2	5	0.4	–	–	3	0.2	2	0.1	–	–	1	1.5
Vulpes vulpes	Red Fox	3	0.2	3	0.3	–	–	4	0.3	–	–	–	–	–	–
Martes americana	Marten	2	0.1	1	0.1	–	–	2	0.1	–	–	–	–	–	–
Microtus sp.	Vole sp.	2	0.1	3	0.3	1	0.5	–	–	–	–	–	–	–	–
Sylvilagus floridanus	Eastern Cottontail	1	0.1	–	–	–	–	–	–	–	–	–	–	–	–
Peromyscus maniculatus	Deer Mouse	1	0.1	–	–	–	–	–	–	13	0.6	–	–	–	–
Martes pennanti	Fisher	1	0.1	2	0.2	–	–	1	0.1	–	–	–	–	–	–
Urocyon cinereoargenteus	Grey Fox	1	0.1	–	–	–	–	–	–	5	0.2	–	–	–	–
Mustela vison	Mink	1	0.1	–	–	–	–	–	–	1	–	–	–	–	–
Cricetinae	Mouse	1	0.1	–	–	–	–	–	–	–	–	–	–	1	1.5
Erethizon dorsatum	Porcupine	1	0.1	1	0.1	1	0.5	–	–	2	0.1	–	–	–	–
Tamiasciurus hudsonicus	Red Squirrel	1	0.1	1	0.1	1	0.5	1	0.1	–	–	1	2.0	–	–
Lepus americanus	Snowshoe Hare	1	0.1	–	–	–	–	3	0.2	10	0.4	–	–	-	–
Lutra canadensis	River Otter	–	–	3	0.3	–	–	2	0.1	4	0.2	–	–	–	–
Sus scrofa	Pig	–	–	–	–	–	–	1	0.1	1	–	–	–	–	–
Ovis aries/Capra hircus	Sheep or Goat	–	–	–	–	–	–	1	0.1	–	–	–	–	–	–
Sciuridae	Squirrel	–	–	–	–	1	0.5	1	0.1	–	–	–	–	–	–
Cervus elaphus ?	Wapiti ?	–	–	5	0.4	–	–	1	0.1	–	–	4	7.8	5	7.6
Lynx sp.	Lynx or Bobcat	–	–	1	0.1	–	–	–	–	–	–	–	–	–	–
Mustelidae	Mustelid	–	–	–	–	1	0.5	–	–	–	–	–	–	–	–
Mephitis mephitis	Skunk	–	–	1	0.1	–	–	–	–	–	–	–	–	–	–
Phenocomys intermedius	Heath Vole	–	–	–	–	–	–	–	–	2	0.1	–	–	–	–
Microtus pennsylvanicus	Meadow Vole	–	–	–	–	–	–	–	–	2	0.1	–	–	–	–
Peromyscus sp.	Mouse	–	–	–	–	–	–	–		19	0.8	–	–	–	–
Blarina brevicauda	Short-tailed Shrew	–	–	–	–	–	–	–	–	–	–	–	1	1.5	
Glaucomys sabrinus	Flying Squirrel	–	–	–	–	–	–	–	–	1	–	–	–	–	–
TOTAL		**1697**	**100.3**	**1118**	**100**	**205**	**100.2**	**1507**	**99.9**	**2251**	**100**	**51**	**100.1**	**66**	**99.9**
Indeterminate mammals		6298		2614		1426		2267		8262		119		995	
GRAND TOTAL		**7995**		**3732**		**1631**		**3774**		**10513**		**170**		**1061**	

Sources: [1]Lennox 1984a; [2]Lennox 1984b.

ginianus for each of the five additional village sites in Table 2, percentages range from 61.0 (Metate) to 75.2 (Hood). Similar to Christianson and Thorold, Bogle I and Bogle II deer percentages were lower. Thus, the additional data presented in this paper confirm Prevec and Noble's (1983) conclusion that deer were of prime importance to the seventeenth century Neutral Iroquoians, but demonstrate that they were as important in the sixteenth century too. Neither an increase nor a decrease in exploitation over time is demonstrated. The three sites from

the sixteenth century have deer percentages which average to 64.6. The earliest seventeenth century sites, Fonger and Carton, have a higher average of 69.5 but the next two sites in the sequence, Christianson and Thorold, have a combined average of only 37.3. On the four sites dating between A.D. 1630 and 1641 (Lennox 1984b:263) or 1645 (Prevec and Noble 1983), deer remains again increased to an average of 67.3 and when Bogle I is ignored because it is possibly a special purpose site, the average for deer becomes 70.1. At the two most recent sites, Hamilton and Bogle II, the average drops to 48.9 but again discounting Bogle II, the average for Hamilton was 61.4. Thus, over this period of time the use of deer was always of prime importance but there were considerable fluctuations in the deer percentages. An increased reliance on deer might predate the sites considered in this paper, as deer percentages were much lower at three other fifteenth century Neutral sites. According to Lennox and Fitzgerald (1990:451), deer remains ranged from as low as 0.9 percent at the Ivan-Elliot site, through 2.6 percent at the Coleman site, to a high of only 2.7 percent at the Moyer site.

Contrary to Prevec and Noble's (1983) claim for racoon, remains of *Canis* sp. usually had the second highest NISPs considering all of the 13 sites (Table 2). Although Iroquoian dogs were domesticated and used for hunting and sometimes kept as pets (Tooker 1967), often dog bones with cut marks and evidence of burning were discarded in middens on these sites, suggesting they were food refuse (Latta 1976). Thus, dogs are considered a component of the diet here. Combining those remains identified as *Canis* sp. with those identified as domestic dog (*C. familiaris*), dog ranked second to deer at five of the sites (Cleveland, Irving-Johnston, Brown, Hood, and Bogle I) and was ranked second with black bear and racoon at one site (Bogle II). Dog remains ranked in third place at four sites (Fonger, Christianson, Thorold, and Metate), and fourth at two (Hamilton and Carton). Thus, dogs were undoubtedly common on these sites. Even at Walker, where *Canis* sp. accounted for only 1.9 percent of the mammalian remains (Prevec and Noble 1983:44), this genus still ranked fifth among a minimum of 27 mammalian species (Wright 1981:166-67). At the upper extreme, dog remains comprised 21.6 percent of the faunal sample at Bogle I.

The possibility of an increase in the proportions of dogs in the historic period on Neutral sites suggested by their second place ranking at Brown (as opposed to fourth at Irving-Johnston and third at Metate) received support from Carton, where dog placed fourth, compared to Hood where they were third, and Bogle I and Bogle II where they were second. But this apparent trend was not consistent with the data from Prevec and Noble (1983). Thus, the idea that more dogs were present on Neutral sites in the post-contact period, similar to the situation on Huron sites (Latta 1976), must be rejected.

On sites where *Canis* sp. was not second, this position was often filled by beaver. Beaver ranked second at Fonger, Christianson, Metate, and Hood and was third at Irving-Johnston, Carton and Brown. In general, beaver remains were relatively much more frequent on the seven additional sites than on Prevec and Noble's (1983) six sites. However, no beaver remains were identified at Bogle I and three other species were represented more commonly than beaver at Bogle II. Still, beavers and dogs were almost equally common on these sites and only deer was more abundant.

The faunal remains from the expanded site sample weaken Prevec and Noble's idea of a decline in beaver exploitation in historic times. There is no consistent pattern to the beaver rankings when all 13 sites are combined. Beaver proportions are greatest at Christianson, but lowest at the contemporary Thorold site, excepting Bogle I where there were no beaver remains. Excluding Thorold because of its unique location, the earliest and the latest sites have the fewest beaver remains. Contemporaneous sites such as Irving-Johnston and Metate, Fonger and Carton, Christianson and Thorold, Brown and Walker, and Bogle I and Hood, show wide divergences in their beaver percentages. Thus, beaver proportions on these 13 sites are not dependent on the dates of the sites, and beaver hunting by the Neutral Iroquoians apparently did *not* increase

after A.D.1600 in response to a European demand for furs. However, supporting Prevec and Noble (1983) was a correlation between beaver proportions and site size. The small to medium-sized Metate and Brown villages had higher beaver numbers than the larger Irving-Johnston, Carton, and Hood sites, all three of which would be termed towns following Prevec and Noble's (1983:44) criteria. Not all of the small sites had high beaver percentages (Cleveland was low) but differential handling of beaver at sites of different sizes deserves further study.

Daillon reported 20 men under the Algonquian chief Iroquet taking 500 beaver in Neutralia in 1626 or 1627 (Sagard 1866:803). This information is important in two ways. First, it shows that beaver were available in the region, as one would expect considering both its numerous wetlands and deciduous forests. It also indicates that beavers were hunted by people other than the Neutral in this region. Perhaps the Algonquians habitually caught beaver here, resulting in fewer beaver specimens than expected on the post-contact Neutral sites. It is possible that beaver were over-hunted in this region, resulting in their decimation, as was reported for Huronia by A.D. 1630 (Sagard 1866:585; Thwaites JR8:57). Whatever the reason(s) for decreased beaver exploitation in the post-contact period, the additional material considered in this paper shows that beaver were more important to the Neutral than Prevec and Noble's (1983) data indicated, but less than the historic sources would lead one to expect.

A much larger animal, black bear, was ranked highly in the seven additional sites considered in this paper. This was unexpected because, although Prevec and Noble (1983:43) mentioned in their text that black bear remains were found on all of the sites they compared, it was not considered one of the five most important species. As mentioned above, black bear ranked in second place at both Bogle II and Carton (Table 2). At Carton, however, almost half the bear remains (10 of 21) were skull pieces from the same provenience and therefore, almost certainly, from the same immature skull (Leventhal 1989:15). However, even conflating these ten specimens to one, bear still ranked third. More often, bear remains comprised about five percent of the totals, ranking them fourth (Irving-Johnston, Metate, and Brown) or fifth (Hood and Bogle I). In fact, bear was fifth at Hamilton too (Lennox 1981:342). Thus, black bears probably were more important to the Neutral than Prevec and Noble's article suggests. This conclusion is supported by Lennox and Fitzgerald (1990:451), who ranked bear third at two of three fifteenth century sites and second at one of these pre fur-trade sixteenth century sites.

In addition to bear, wapiti, racoon and grey squirrel were often ranked in fifth place. At two sites (Irving-Johnston and Metate), wapiti was fifth. This large deer was more common in the additional sites than in those considered by Prevec and Noble (1983). Wapiti was sixth, tied with moose (*Alces alces*) and woodchuck, at Brown. Racoon was significant too. Where bear was ranked fifth, racoon was in fourth place (Hood and Bogle I) and racoon was fifth at Brown. Among the additional sites used in this paper, racoon ranked second at Bogle II only, and as low as eighth at Metate (Table 2). Therefore, racoon was less important than Prevec and Noble 1983:45) thought. However, there is a general increase in racoon rankings over time, which likely reflects European trade, as Prevec and Noble (1983) suggested. Except for racoon being as high as third place at the early Cleveland site, its ranking increased gradually to a high second place standing at the most recent Hamilton and Bogle II sites. Furthermore, at Hamilton, most of the racoon specimens were extremity bones which, as Pihl noted, could represent pelts with feet attached (Pihl 1977b:2). Similarly, all of the nine racoon specimens from Bogle II were foot bones and one of two from Bogle I was a phalange (Nicole 1979). Finally, the scarcity of racoon remains on the fifteenth century sites considered by Lennox and Fitzgerald (1990:451) supports the conclusion that racoons increased in importance to Neutral people over time.

Prevec and Noble (1983) found that grey squirrel was among the five most common mammals in the sites they considered and that squirrel frequencies increased over time. But among the additional sites reviewed here, while this small

fur-bearer was common at Irving-Johnston (sixth) and Metate (seventh), it was absent from four other sites (Carton, Brown, Bogle I, and Bogle II). The importance of grey squirrel to the Neutral has been confirmed by the remains at Irving-Johnston and Metate, but increased harvesting of them is not supported. Although squirrels ranked higher than their small body size would suggest at both Irving-Johnston and Metate, none was positively identified at either of the later Carton or Brown sites. Grey squirrels occurred in small numbers at Hood, but not at Bogle I or Bogle II (Lennox 1984b, 1984a). At the fifteenth century Ivan Elliot site, squirrel remains were the most commonly identified mammalian remains, with a percent of 24.5 (Lennox and Fitzgerald 1990:451). Combined, the evidence indicates an early and continuing interest in these small, fur-bearing mammals, with some villages apparently concentrating on squirrel exploitation. Similarly, the tiny Eastern Chipmunk was procured by the occupants of most of these sites, ranking fifth at Carton.

Before concluding this discussion of mammals exploited for their furs as well as their meat, mention should be made of the muskrat (*Ondatra zibethicus*). It was not one of the top five species in any of the sites considered here. However, this fur-bearer ranked eighth at Walker (Wright 1981:166-167) and Brown, ninth at Hamilton (Lennox 1981:342) and Metate, eleventh at Christianson, and thirteenth at Irving-Johnston. It was second to last at Hood and was also represented in the small Bogle II sample (Table 2). Although no such remains were identified from Carton or Bogle I, muskrat was caught more consistently than many other species, falling in the middle range of the mammalian rankings on most of these sites. An interest in muskrat appears to have a long history too. Lennox and Fitzgerald (1990:451) showed that the frequency of muskrat was generally high prior to the fur-trade, but that its highest percentage in five post-fur trade sites was a mere 1.1 percent. Thus, muskrat procurement might have been declining in importance among the Neutral.

The main contributions of this study to our current understanding of the importance of the various fur-bearers to the Neutral Iroquoians include: greater exploitation of beavers and black bears than previously thought; a pre-contact interested in grey squirrel; a similar exploitation of eastern chipmunks; less interest in racoons, but with that increasing over time; and a possible decline in muskrat exploitation. Despite the new evidence of a greater use of beaver by Neutral, beaver did not show the expected increase that would indicative of European demand for this fur. However, there might be a correlation between site size and beaver hunting or preparation.

In sum, the mammalian evidence from these sites indicates that after A.D. 1563, the Neutral concentrated on white-tailed deer, beaver, *Canis* sp., black bear, wapiti, and racoon and, at some sites, grey squirrel and eastern chipmunk. Moose, which provide a great amount of meat, were taken consistently, as were woodchuck, fox and muskrat. That squirrel and chipmunk were represented more frequently than many of the larger mammals suggests that these small mammals were purposefully taken, likely for their furs. They serve as a reminder that mammals were important for more than just their dietary contributions. The very few remains of the various mustelids suggests these mammals were not targeted by the Neutral, although they did take them occasionally. Interestingly, the variable frequencies of rabbit remains between the sites suggest that some communities disregarded this mammal (Metate, Carton, Bogle I and Bogle II) whereas others exploited them often (Irving-Johnston and Hood).

Finally, the large sample of over 10,000 faunal remains from the Walker site included two species not recognized at the other sites but which now can be added to those in Table 2 as mammals occurring on Neutral sites (Wright 1981:166-167). Similarly, two species unique to Hamilton can be added (Lennox 1981:342). Thus, at least 32 distinct wild mammal species have been identified from these Neutral sites.

Fish Frequencies

From the fish remains (Table 3), it is apparent that suckers and catfish were very important, as Prevec and Noble (1983:44) stated, but members

of the salmon family were sometimes even more significant. Whitefish, in particular, but also trouts and Atlantic salmon (*Salmo salar*) were frequent on these sites, ranking first in this class at some (Irving-Johnston, Metate, Carton, Bogle I and Bogle II). The Hood sample is unique in having no remains of whitefish, trout or salmon but despite this, the present study shows that members of this family reached significant numbers on Neutral sites. While catfish remains were found on most of these sites, all, except Carton, had remains of walleye or sauger and on four out of seven sites (Table 3), their NISPs were higher than those of the combined catfish identifications. Prevec and Noble (1983:44) decided that freshwater drum was very popular but this was not corroborated by the additional data. Freshwater drum was represented at Hood only, and by one specimen only. At Walker, drum ranked fourth behind suckers, catfish and walleye/saugers (Rick and Cumbaa [1976] cited in Wright 1981:169-170), but it can no longer be considered particularly popular on these Neutral sites. Rather their inhabitants apparently caught members of the trout/salmon and sucker families frequently, but also fished sauger/walleyes and catfish, particularly brown bullhead and channel catfish (*Ictalurus punctatus)*, regularly. Pike, particularly northern pike (*Esox lucius*), and basses were also common on these sites.

Although the Neutral people concentrated their efforts on the fish mentioned above, they exploited quite a variety of species. From the Walker fish remains, six species can be added to those in Table 3. As well, both sauger (*Stizostedion canadense*) and yellow walleye (*S. vitreum*) remains were identified to species (Wright 1981:169-170). Both Hamilton (Lennox 1981:344) and Christianson (Fitzgerald 1982:27) had two species not found at any of the other sites. Thus, the total variety of fish known from Neutral sites is at least 23 species.

Table 3. *Fish from seven Neutral sites in the Crawford Lake area.*

		Irving-Johnston		Metate		Carton		Brown		Hood[1]		Bogle I[2]		Bogle II[2]	
Scientific Name	**Common Name**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Coregonus sp	Whitefish	15	25.9	47	42.3	–	–	1	6.7	–	–	–	–	–	–
Catostomidae	Sucker sp.	14	24.1	12	10.8	–		10	66.7	1	2.2	–	–	1	3.8
Ictalurus nebulosus	Brown Bullhead	4	6.9	–	–	–	–	–	–	23	50	–	–	–	–
Esox lucius	Northern Pike	4	6.9	2	1.8	–	–	–	–	1	2.2	–	–	–	–
Salvelinus namaycush	Lake Trout	3	5.2	9	8.1	–	–	–	–	–	–	–	–	–	–
Esox sp.	Pike sp.	3	5.2	9	8.1	–	–	3	20	–	–	–	–	–	–
Salvelinus sp	Trout sp.	3	5.2	5	4.5	–	–	–	–	–	–	–	–	–	–
Anguilla rostrata	American Eel	2	3.4	–	–	–	–	–	–	–	–	–	–	–	–
Micropterus	Bass sp.	2	3.4	–	–	–	–	–	–	–	–	–	–	–	–
Ictalurus sp.	Bullhead sp.	2	3.4	3	2.7	–	–	–	–	–	–	–	–	–	–
Stizostedion sp.	Sauger/Walleye	2	3.4	19	17.1	–	–	1	6.7	13	28.3	1	20	3	11.5
Amia calva	Bowfin	1	1.7	–	–	–	–	–	–	–	–	–	–	1	3.8
Perciformes	Perch	1	1.7	–	–	–	–	–	–	–	–	–	–	2	7.7
Salmo sp.	Salmon	1	1.7	–	–	–	–	–	–	–	–	–	–	–	–
Salmonidae	Salmon	1	1.7	–	–	23	92	–	–	–	–	3	60	15	57.7
Lepomis gibbosus	Pumpkinseed	–	–	3	2.7	–	–	–	–	–	–	–	–	–	–
Ictaluridae	Catfish sp.	–	–	2	1.8	1	4	–	–	–	–	–	–	–	–
Acipenser fulvescens	Lake Sturgeon	–	–	–	–	–	–	–	–	1	2.2	–	–	1	3.8
Aplodinotus grunniens	Freshwater Drum	–	–	–	–	–	–	–	–	1	2.2	–	–	–	–
Ictalurus punctatus	Channel Catfish	–	–	–	–	1	4	0	0	6	13	–	–	2	7.7
Salmo salar	Atlantic Salmon	–	–	–	–	–	–	–	–	–	–	1	20	1	3.8
TOTAL		**58**	**99.8**	**111**	**99.9**	**25**	**100**	**15**	**100.1**	**46**	**100.1**	**5**	**100**	**26**	**99.8**
Indeterminate fish		157		71		1		17		453		19		16	
GRAND TOTAL		**215**		**182**		**26**		**32**		**499**		**24**		**42**	

Sources: [1]Lennox 1984a; [2]Nicole 1979

Bird Frequencies

Birds remains were not very common on any of the sites considered in this paper (Table 1) but a few patterns can be discerned. Passenger pigeon was the most frequently represented bird followed by wild turkey on nearly all the sites (Table 4). At Metate, the order of these two species was reversed whereas both Carton and Bogle II lacked turkey bones. The common predominance of pigeon was accentuated at Hood where 50 specimens accounted for 70.4 percent of those bird bones identified to species (Lennox 1984a:182). There can be little doubt that passenger pigeon and wild turkey were the most significant avian species to the Neutral Iroquoians, as Prevec and Noble (1983) showed. They also noted an increase in bird exploitation over time, attributable to the greater numbers of passenger pigeon bones on the later sites. Despite the evidence from Hood, this change over time was not confirmed by the additional sites in the present study. The A.D.1630 or later Brown, Hood, and Bogle II sites had avian percentages which were among the lowest of all the sites (Table 1). However, Prevec and Noble's observation that larger sites had greater proportions of birds, was supported by the finds from the Oakville Creek sites. Irving-Johnston, the largest of these four sites, had proportionately more bird bones and a much higher percentage of passenger pigeon

Table 4. *Birds from seven Neutral sites in the Crawford Lake area.*

		Irving-Johnston		Metate		Carton		Brown		Hood[1]		Bogle I[2]		Bogle II[2]	
Scientific Name	**Common Name**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Ectopistes migratorius	Passenger Pigeon	53	66.3	4	7.8	1	25.0	6	27.3	50	70.4	1	20.0	7	77.8
Meleagris gallopavo	Wild Turkey	13	16.3	10	19.6	–	–	5	22.7	3	4.2	1	20.0	–	–
Buteo sp.	Hawk sp.	3	3.8	–	–	–	–	–	–	–	–	–	–	–	–
Corvus brachyrhynchos	Common Crow	2	2.5	–	–	–	–	–	–	–	–	–	–	–	–
Aves	Large Bird	2	2.5	–	–	–	–	–	–	–	–	–	–	–	–
Colaptes auratus	Northern Flicker	2	2.5	–	–	–	–	–	–	–	–	–	–	–	–
Melanitta nigra	Black Scoter	1	1.3	–	–	–	–	–	–	–	–	–	–	–	–
Anatidae	Duck sp.	1	1.3	2	3.9	1	25.0	–	–	–	–	1	20.0	2	22.2
Bonasa umbellus	Ruffed Grouse	1	1.3	2	3.9	–	–	–	–	–	–	–	–	–	–
Corvus corax	Common Raven	1	1.3	2	3.9	–	–	–	–	–	–	–	–	–	–
Meleagris gallopavo?	Turkey?	1	1.3	–	–	–	–	–	–	–	–	–	–	–	–
Gavia immer	Common Loon	–	–	–	–	–	–	3	13.6	–	–	–	–	–	–
Branta canadensis	Canada Goose	–	–	–	–	–	–	2	9.1	–	–	–	–	–	–
Gaviidae	Loon sp.	–	–	–	–	–	–	2	9.1	–	–	–	–	–	–
Anser/Branta	Goose sp.	–	–	1	2.0	–	–	2	9.1	–	–	–	–	–	–
Ectopistes migratorius ?	Passenger Pigeon ?	–	–	–	–	–	–	1	4.5	–	–	–	–	–	–
Cygnus columbianus	Tundra Swan	–	–	–	–	–	–	1	4.5	–	–	–	–	–	–
Strix varia	Barred Owl	–	–	8	15.7	–	–	–	–	–	–	–	–	–	–
Bucephala albeola	Bufflehead	–	–	1	2.0	–	–	–	–	–	–	–	–	–	–
Clangula hyemalis	Oldsquaw	–	–	14	27.5	–	–	–	–	15	21.1	–	–	–	–
Somateria mollissima	Common Eider	–	–	1	2.0	–	–	–	–	–	–	–	–	–	–
Bucephala clangula	Common Goldeneye	–	–	1	2.0	–	–	–	–	–	–	–	–	–	–
Mergus merganser	Common Merganser	–	–	1	2.0	–	–	–	–	–	–	–	–	–	–
Mergus serrator	Red-breasted Merganser	–	–	1	2.0	–	–	–	–	–	–	–	–	–	–
Aythya marila	Greater Scaup	–	–	1	2.0	–	–	–	–	–	–	–	–	–	–
Aythya collaris	Ring-necked Duck	–	–	1	2.0	–	–	–	–	–	–	–	–	–	–
Melanitta fusca	White-winged Scoter	–	–	1	2.0	–	–	–	–	–	–	–	–	–	–
Dendragapus canadensis	Spruce Grouse	–	–	–	–	1	25.0	–	–	2	2.8	–	–	–	–
Columbidae sp.	Pigeon/Dove	–	–	–	–	1	25.0	–	–	–	–	–	–	–	–
Podiceps auritus	Horned Grebe	–	–	–	–	–	–	–	–	1	1.4	–	–	–	–
Haliaeetus leucocephalus	Bald Eagle	–	–	–	–	–	–	–	–	–	–	2	40.0	–	–
TOTAL		**80**	**100.4**	**51**	**100.3**	**4**	**100**	**22**	**99.9**	**71**	**99.9**	**5**	**100**	**9**	**100**
Indeterminate avian		97		33		8		20		149		5		7	
GRAND TOTAL		**177**		**84**		**12**		**42**		**220**		**10**		**16**	

Sources: [1]Lennox 1984a; [2]Lennox 1984b.

bones than the other three sites (Table 4). But conversely, among the Bronte Creek sites, the small Bogle I site had a higher proportion of birds than did Hood or the Oakville Creek sites.

Although all the avian samples are small, they suggest a disregard for ducks at some sites, particularly Irving-Johnston and Brown. On the other hand, the people at Metate and Hood appear to have emphasized duck hunting. Ducks were not common at Walker or Hamilton, but the oldsquaw (*Clangula hyemalis*) occurred in considerable numbers at Hamilton, and it ranked second to passenger pigeon at Hood. Combining the species listed in Table 4 with those from Walker (Wright 1981: 171-172) and Hamilton (Lennox 1981), it can be seen that at least 54 different species of birds were exploited by these peoples. Included in this extremely high number of species were many passerine bird species, particularly from Hamilton (13 species); these small birds would have contributed very little meat and were possibly collected for their colourful feathers. Eight species of hawks, eagle, and owls were represented at these 13 sites, hinting at an interest in birds of prey.

Reptiles, Amphibians and Invertebrates

Reptile and amphibian remains were scarce at the Crawford Lake area sites, confirming Prevec and Noble's (1983) evidence that such animals were collected only infrequently by the Neutral Iroquoians (Table 1). Reptiles were represented more frequently than amphibians (Table 5). Painted (*Chrysemys picta*) and then snapping (*Chelydra serpentina*) turtles were the most common ones on most of these sites. Wood turtle (*Clemmys insculpta*) remains were also common and there were several other native species represented in low numbers. A box turtle (*Terrapene carolina*) shell from Irving-Johnston was drilled, and so probably was traded into the region as a finished artifact since these turtles are not native to the Crawford Lake area (Froom 1978). A worked box turtle shell fragment was also identified at the Walker site (Wright 1981:103). Combining the species listed in Table 5 with those identified from Walker (Wright 1981:174) and Hamilton (Lennox 1981), the total number of turtle species known from Neutral sites is nine. Snake bones were rarely found (one at Irving-Johnston and one at Walker). Amphibian bones were rare, except at Christianson and Walker. From Hood, there was a positive identification of bullfrog (*Rana catesbeiana*). Thus, bullfrogs and other smaller frogs were occasionally collected, as were at least nine turtle species and a very few snakes.

Invertebrates were more common. On 11 of the sites, shells were more numerous than reptile and amphibian remains, perhaps, at least in part, because a single shell usually breaks into many more pieces than a single bone. Invertebrate

Table 5. *Reptiles from seven Neutral sites in the Crawford Lake area.*

		Irving-Johnston		Metate		Carton		Brown		Hood[1]		Bogle I[2]		Bogle II[2]	
Scientific Name	**Common Name**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Terrapene carolina	Box Turtle	9	34.6	–	–	–	–	–	–	–	–	–	–	–	–
Clemmys insculpta	Wood Turtle	6	23.1	1	4.8	1	25.0	2	11.8	–	–	–	–	–	–
Chelydra serpentina	Snapping Turtle	5	19.2	2	9.5	3	75.0	7	41.2	–	–	–	–	1	100
Chrysemys picta	Painted Turtle	4	15.4	13	61.9	–	–	7	41.2	6	100.0	–	–	–	–
Clemmys insculpta?	Wood Turtle?	1	3.8	–	–	–	–	–	–	–	–	–	–	–	–
Emydoidea blandingi	Blanding's Turtle	–	–	–	–	–	–	1	5.9	–	–	–	–	–	–
	Turtle sp. ?	–	–	5	23.8	–	–	–	–	–	–	–	–	–	–
	Snake	1	3.8	–	–	–	–	–	–	–	–	–	–	–	–
TOTAL		**26**	**99.9**	**21**	**100**	**4**	**100**	**17**	**100.1**	**6**	**100**	**–**	**–**	**1**	**100**
Indeterminate reptiles		17		3		1		1		7		–		–	
GRAND TOTAL		**43**		**24**		**5**		**18**		**13**		**–**		**1**	

Sources: [1]Lennox 1984a; [2]Lennox 1984b.

remains account for over 20 percent of the faunal samples at Cleveland and Bogle II and over ten percent at three other sites (Table 1). Bivalve clams of the genus *Elliptio* accounted for nearly all of these remains. They might represent raw materials for tools as much as food refuse. Shell scrapers and beads were found at Irving-Johnston, Metate, Carton, and Brown (Finlayson 1998:2:Tables 2.5.113 and 2.5.114, Finlayson 1998:4:Plate 4.5.91).

Discussion: Factors Affecting Variability Among the Sites

While many factors might account for the similarities and the variability seen in the faunal samples described above, two primary factors will be considered here: differences caused by site locations in terms of microenvironments, particularly proximity to water, and changes over time that might be due to increasing interaction between the Neutral and Europeans in the early 1600s. Taphonomic factors affecting these samples will be assumed to be similar and insignificant, as reported by their excavators and/or analysts. Excavation techniques across the sites were similar too, although less screening at Brown undoubtedly reduced its fish sample (Stewart 1991). For most of the sites, the faunal samples were derived primarily from middens, although the sizes of the sites varied. Bogle I and Bogle II were the most different in this respect, and their small sizes suggest that they might have been hamlets. Noting inconsistencies between the archaeological record and Daillon's descriptions of "hamlets", Lennox (1984a:266-7) opted to call Bogle I and Bogle II "satellite villages". There is little evidence in their faunal samples that these sites were occupied in order to extract specific animal resources. Their faunal assemblages indicated use over more than a single season, supporting Lennox's (1984a:264) conclusion that these sites were occupied year-round. Possibly, Bogle I and II do not represent the sort of hamlet to which Daillon was referring. Daillon's hamlets held seven or eight small cabins. Five houses were located at Bogle I even though only 35 percent of the site was excavated and parts of four houses were uncovered in the 20 percent of Bogle II that was investigated. Thus both these sites could have accommodated more than "seven or eight" cabins. Furthermore, while some of the buildings at these sites were small, others were like the longhouses at the larger villages where some small structures also occurred. In sum, Bogle I and Bogle II cannot be shown to be special hunting or fishing camps based on their faunal assemblages and they do not fit Daillon's description of hamlets. Whether they were satellites of larger villages cannot be confirmed or denied here. In this paper, they will be considered small village sites. In addition to site sizes, the sizes of the faunal assemblages varied. The total number of specimens for comparison from Bogle I, Bogle II, and Carton is much less than that from the other sites. Finally, the zooarchaeological techniques used to study and report on these samples were similar, although there might be a bias towards larger, more easily identified remains in the student papers. While the differences mentioned above should not be ignored, it is felt that the faunal samples from these sites are comparable, based on the similarities in taphonomic factors, excavation techniques and faunal analyses. Differences in the faunal assemblages of these 13 sites are thought to correspond to actual differences in the animal remains deposited on the sites by their inhabitants.

Environmental Factors and Faunal Differences

While all of the sites considered in this paper were in close proximity to one another (Figure 1), with the exception of the easterly Thorold site, there are some environmental differences in their locales that might explain some of the variation in their faunal samples. A major difference is that the majority of the sites are located above the Niagara Escarpment with only three, Irving-Johnston, Carton and Brown, below it. Although the Escarpment forms a steep, high wall along much of its course, a break in this feature in the northern segment of the Crawford Lake area, means that it is does not constitute much of a barrier to the movement of people or animals in this location. Both major branches of the Oakville Creek cross it here, producing very

small falls (Finlayson, personal communication 1999). However, the upper reaches of these branches are very shallow and so are not navigable by canoe. This factor would have been more inhibiting for the Metate and Brown populations than for those at Irving-Johnston and Carton, which are both located farther downstream. Similarly, Hood, Bogle I, Bogle II, and Hamilton are all situated above the Escarpment on tributaries of Bronte Creek; Christianson is also above the Escarpment, on a tributary of Spencer Creek. These three creeks flow into the western end of Lake Ontario. Cleveland, Fonger and Walker are all on tributaries of the Grand River which empties into Lake Erie. Among the Oakville Creek sites, it might be expected that fish taken from Lake Ontario would form their highest percentages at Irving-Johnston and Carton. Whitefish was the top-ranked species at Irving-Johnston and, if the bones identified as salmonidae at Carton are whitefish, then here too, this was the top-ranked fish. In keeping with this provenience-based argument, whitefish was one of the last-ranked pair at Brown. But, it was first at Metate where it formed a much greater percentage of the fish remains than at either Irving-Johnston or Brown. This was also true for lake trout (*Salvelinus namaycush*). Thus, it is apparent that location on Oakville Creek and the slight differences in distances from Lake Ontario were insignificant factors to the exploitation of lake fish. Similarly, considering the Grand River sites, it might be supposed that those closer to Lake Erie (Walker and then Fonger and Cleveland), would have higher proportions of lake fish than those farthest away (Christianson and Hamilton). Fish, as a class, was ranked lower than birds at Hamilton, the site farthest upriver, and fish did reach their highest percentage at Walker, the site farthest downstream. But for the sites in between these two, there is no pattern of decreasing amounts of fish in sites progressively farther upstream. At Hamilton, the only lake species in the sample of 855 fish remains was one identified as salmonidae whereas the majority were species found in shallow waters such as small tributaries and marshes. Such fish, particularly suckers and catfish, dominated the Walker sample too, but, at this site, there were also considerable numbers of lake sturgeon, whitefish and freshwater drum, all of which were likely caught in Lake Erie or the lower reaches of the Grand River. Thus, location on the Grand River system does seem to have influenced the numbers and types of fish caught, whereas the same is not true for sites located on rivers flowing into Lake Ontario.

One might expect fish preferring shallow, slow moving, and weedy waters to be most common on sites located above the Escarpment. However, because whitefish bones dominated the Metate sample, it is likely that the Metate people fished from Lake Ontario where they also took their fourth-ranked lake trout. As well, their second-placed sauger/walleye "thrive in clear, cold lakes and rivers, especially where there are extensive forage and spawning areas" (Mackay 1963:234). They are active all winter and, therefore, can be fished through the ice. The third-ranked suckers are also lake fish which ascend clear rivers to spawn. Thus, the top four species at Metate are primarily cold water creatures. The remaining species (catfish, including bullheads, pumpkinseeds [*Lepomis gibbosus*], and northern pike) could all be fished from marshes. But, it is evident that the Metate people did not emphasize these. Brown bullhead ranked higher at Irving-Johnston than at Metate. However, at Irving-Johnston, Brown and Carton, the species identified less frequently were those preferring shallow, warm, vegetated waters. Thus, the fish remains suggest that although the people living at these villages exploited fish from rivers and/or marshes available in the immediate vicinities of their villages, they fished more productively further away in a large lake, most likely Lake Ontario. The same is not true for those villages located on the Grand River drainage system. Fish from these sites were predominately from the local rivers and marshes with interest in lake species being moderately strong only on the sites located farthest downriver, as discussed above. Thus, the Grand River sites meet the expectation of shallow-water fish being most common on sites located above the Escarpment as do all but Metate of the Oakville Creek sites.

While living beside rivers was evidently normal for these Neutral communities, proximity to wetlands probably was desired too. The concentration of swamps and muck soils indicative of swamps above the Escarpment (Finlayson 1998:1:Figure 1.1.26) might be significant. The tendency for Neutral sites to be located near such wetlands has been previously noted by both Noble (1984:15) and Fitzgerald (1984:4). Their explanation was that such areas provide wintering areas for white-tailed deer. However, the only Oakville Creek site above the Escarpment, Metate, had the lowest percentage of deer (Table 2). Possibly Irving-Johnston and Brown had slightly higher proportions of deer remains because they were located fairly close to swampy areas, even though such areas are generally much less common and less extensive below the Escarpment. Similarly, Carton was located at the edge of a marsh. Another explanation might lie in the greater density of sites below the Escarpment. There would be more areas of secondary growth, which are favourable to deer populations, where there were more abandoned village sites and fields. To date, in this part of the Crawford Lake region, more archaeological sites have been found below the Escarpment. However, Finlayson et al (1998) have argued that the presence of large pine stump fences above the Escarpment in the northwest corner of the Crawford Lake area suggests there are sites still to be located near Metate. Therefore, it is possible that future survey will reveal that the density of villages was not greater below the Escarpment, negating this explanation for higher deer populations at Irving-Johnston, Brown and Carton than at Metate.

Prevec and Noble's (1983) review and Lennox's (1981, 1984a, 1984b) reports of the Bronte Creek sites show that deer remains were usually dominant in the mammalian samples from the sites located above the Escarpment. However, not all sites above the Escarpment had large proportions of deer. The atypically lower quantities of deer at some of these sites can be explained. That Thorold had the lowest total percentage for deer of all 13 sites actually supports the argument that deer capture was most prevalent close to large swamps because Thorold was situated farthest from these extensive wetlands. The lower percentages for deer at the Bogle I and Bogle II sites might be related to their small sizes and the possibility that they were special extraction sites for some other resource. But the mere 41.5 percent occurrence of deer at Christianson seems anomalous. Excluding Bogle I and Bogle II and ranking the remaining 11 sites by their deer percentages, it can be seen that the three sites located below the Escarpment (Irving-Johnston, Carton and Brown) are clumped together in the middle of the sequence of sites ordered by deer percentages. Five sites had lower proportions of deer remains and three had higher. Thus, location above or below the Escarpment appears to be unrelated to the procurement of deer, whereas being near swamps, and possibly also re-occupation of areas previously settled, was beneficial for the exploitation of deer.

Some of the other less frequently exploited animals would also be common in wetlands. Metate's proximity to such areas might explain this site having both the greatest representation of beaver and muskrat, and the greatest variety and quantity of duck bones among the four Oakville Creek sites. Oldsquaw remains were also very common at Hood. A wide variety of waterfowl was collected from the Walker and Hamilton sites, including ducks, geese, swans, grebes and loons. Thus, waterfowl hunting seems to have been more common at sites located above the Escarpment and apparently bird exploitation from wetlands was practised close to home. It appears that the people at Irving-Johnston and their descendants at Brown and Carton did not hunt ducks.

Reptile remains were few, allowing only tentative generalizations about their procurement. The snapping and painted turtles were exploited most, with limited collection of other species. These native turtles could have been taken from the river systems on which the sites were located, although one might expect a greater density of turtles near marshes. In fact, sites located above the Escarpment do have the highest percentages of reptiles, generally. Exceptions are Hood and Bogle II, which had few reptile remains, and

Bogle I which had none. The higher proportion of wood turtle remains at the three sites below the Escarpment might reflect the relative scarcity of wetlands there, since wood turtles prefer drier habitats than the other native species (Froom 1978).

Thus, proximity to marshes seems to have been advantageous for white-tailed deer, beaver, muskrat, and duck hunting and possibly for collecting turtles, but may have been less significant for fishing. If ducks were indeed more prevalent in the marshes above the Escarpment, then the lack of ducks in the Irving-Johnston and Brown samples suggests that these people did not go up onto the Escarpment to hunt ducks. Was this prominent geological feature a hunting territory boundary line? Future studies of faunal samples from more sites located below the Escarpment should help answer this question.

Changes Over Time and Possible European Influences

Differences in the faunal samples from these sites could also reflect change over time. According to Finlayson (1998:1:396), the Brown and Carton villages were both outgrowths of the Irving-Johnston population. Thus, these three sites provide evidence of the same community over the early years of European contact. The greatest potential source of change at this time was the arrival of Europeans themselves to southern Ontario in the early 1600s. One would expect to find variations in the faunal material reflecting influences of the fur trade. Prevec and Noble (1983:45) mentioned this as a possible explanation for an increase in racoon remains on the sites they compared. Changes in the faunal samples reflecting the reported increases in illness among the aboriginal populations can also be considered.

From Pre-Contact to Post-Contact Sites

The Irving-Johnston village was occupied just when European influences were set to impinge on the lifestyles of the Iroquoians (Trigger 1985) whereas the Brown village existed after Brulé's 1615/1616 travels in the Neutral area, as reported by Champlain (Biggar 1922-36:3:58), and possibly during Daillon's 1626/1627 visit (Sagard 1866) and/or that of Brebeuf and Chaumonot in 1640-1641 (J. Lalemant in Thwaites 1896-1901:20:95,103-105, 21:187, 28:37-41). Similarly, villagers at Carton might have been visited by Brulé and/or Daillon. Whereas no trade goods have been recovered from Irving-Johnston, 65 such objects were found at Brown (Finlayson 1998:1:345) and 35 European metal objects were recovered from Carton (Finlayson 1998:1:864).

The similarities among the faunal classes from these sites are much greater than their differences, which was to be expected considering their cultural inter-relatedness and close proximity. At Irving-Johnston, mammalian remains accounted for about five percent less of the total faunal sample than at Brown, where such remains formed an extremely high proportion of the assemblage. To some degree this may reflect less screening of soils during the Brown excavations. The Irving-Johnston percentage was almost identical to that at Carton. It appears that this population continuously extracted the highest proportion of mammals. Of the other sites, only at Hood did mammalian remains represent over 90 percent of the sample.

Over time, the proportion of mammals remained high at these sites but diversity decreased; 23 wild species were represented at Irving-Johnston compared to 16 at Brown and 12 at Carton. A small part of this difference was produced by at least three species of small rodents at the earlier site. Despite this reduction in richness over time, the same four mammalian species remained predominant at all three sites, but there are some interesting variations. At Irving-Johnston, *Odocoileus* specimens accounted for 68.3 percent of the mammals identified beyond class, whereas at Brown and Carton they slipped slightly (Table 2). Similarly, wapiti percentages dropped. Although moose remains were fractionally more frequent at Brown, none were found at Carton. Thus, the deer family, while continuing to dominate the hunt, might have been reduced in importance due to increased exploitation of fur-bearers for trade. The percentage of beaver remains increased through time at these three sites, almost doubling from Irving-

Johnston to Brown. However, while this trend was supported by Hood, the reverse situation occurred in Prevec and Noble's (1983:Table 2) sites. The percentage of beaver was higher at Metate than at sites dating both before and after it, with the single exception of Christianson. Thus, while the Irving-Johnston peoples might have increased their efforts to take beaver, there is no clear trend towards increased beaver exploitation among Neutral Iroquoians in general, despite the European demand for such furs. However, the additional sites included in this paper indicate that beaver maintained their relative position over time rather than declining in importance. Black bear increased slightly from Irving-Johnston to Carton and Brown, a pattern strengthened by remains at Metate, Hood, and Bogle II (Table 2). Similarly, racoon remains increased from Irving-Johnston to Brown and Carton, a trend which was found in the larger sample of sites, particularly those studied by Prevec and Noble who thought this was "probably as a result of increased fur trade following contact with the French" (Prevec and Noble 1983:45). On the basis of the assemblages from the additional sites used in the present study, the importance of racoons can be seen to be considerably less than previously thought, but their increased exploitation after A.D. 1613 is demonstrated.

Dog and *Canis* sp. remains showed a considerable decline in percentage from Irving-Johnston to Carton, but a notable increase at Brown. Thus, no trend is apparent for this species when the additional ten samples are considered. The second place ranking of dog at both of the small sites, Bogle I and Bogle II, is interesting and might be related to special functions of these places. But at all sites, dogs were common. If hunting increased after the arrival of the Europeans, it apparently did not result in more hunting dogs being raised.

Most of the remaining species of smaller mammals showed little or no change in importance at these sites. Squirrel is, however, of particular interest, considering the exchange of squirrel furs between the Neutral and Huron as was observed by the French in the 1600s (Thwaites 1896-1901:17:165, 243; 21:197). Grey squirrel's relatively high sixth-place ranking at Irving-Johnston suggests that an interest in their furs extended back to the 1560s at least. Similarly, the high ranking of chipmunk suggests a selection for their pelts. Chipmunk ranked eighth among the mammal remains at Irving-Johnston and tied for fourth at Carton. Thus, this community, unlike some of the others considered in this paper, exhibited an interest in small fur-bearers, an interest which predated the seventeenth century, but persisted through the contact period. However, the occurrence of squirrel at these three sites, and at all the additional ones in the present study, remained under two percent, which is nowhere near their high percentages at Thorold, Walker, and Hamilton. Thus, it has now been shown that while squirrel procurement was of major importance at some post-1615 sites, this was not always the case and at most sites, squirrels were taken in modest numbers.

Fish were continually exploited by the Neutral people. From Irving-Johnston to both Carton and Brown, fish percentages drop, suggesting a decrease in fishing over time, and specifically much less lake fishing for whitefish, while fishing for suckers and sauger/walleye increased, at least at Brown (Table 3). Fish percentages were low at the late Hood and Bogle II sites, but high at Bogle I. Contrary to the apparent decline in fishing, however, fish percentages were maintained or increased over time at the sites considered by Prevec and Noble (1983). The highest percentages for this class are found at the roughly contemporaneous, post-contact Walker and Bogle I sites. Thus, fishing activities appear to have varied in intensity at the different sites, regardless of the dates of those sites.

Bird bones were more frequent at Irving-Johnston than at either of the later sites. Fewer bird bones might reflect decreasing interest in their long bones for bead manufacturing due to an increasing availability of glass trade beads. At least 610 glass beads have been excavated from the Carton ossuary and eight were from the Brown village (Fitzgerald 1990; Finlayson 1998:1:865). Bone beads formed 43.6 percent of the bone, antler and shell artifacts at Irving-

Johnston, but at Brown and Carton the corresponding figures dropped to 37.7 percent and 34 percent (Finlayson 1998:866,868). Conversely, a demand for large birds should have developed after the introduction of European diseases and the resulting epidemics between 1634 and 1640 (J. Lalemant in Thwaites 1896-1901:21:191) because their long bones were used for making sucking tubes, which were important in curing rituals. Similarly, large wings – in one recorded Huron instance turkey wings (Le Mercier in Thwaites 1896-1901:13:241,243) – were also used in such rituals. Bone sucking tubes do postdate A.D. 1630 (Lennox and Fitzgerald 1990:423). Wild turkey bones formed a higher percentage of bird bones at Brown than at Irving-Johnston, and remains of other large birds, such as Canada goose, tundra swan, and loon, were found at Brown but not at Irving-Johnston. In addition, whereas no sucking tubes have been excavated from Irving-Johnston (nor contemporaneous Metate), one was found at Brown (Finlayson 1998:2:Tables 2.5.113 and 2.5.114). There is support for increased manufacture of bone tubes made from both mammal (especially white-tailed deer and dog) and large bird long bones after A.D. 1630. At Hamilton, 81 percent of the worked bone was tubes or tube waste pieces (Lennox 1981:305) and at Hood, such pieces were 79.9 percent of the worked bone (Lennox 1984b:99). Such artifacts also formed 80 percent of the small sample from Bogle II (Lennox 1984a:252), and the single worked bone from Bogle I was a tube (Lennox 1984a:220-221). Thus, Europeans, specifically their diseases, appear to have caused changes in the uses of birds among the Neutral, although the major species, passenger pigeon and wild turkey, continued to be harvested most.

Invertebrates were rarer at Brown than Irving-Johnston, possibly because shell beads and scrapers, such as those found at Irving-Johnston, were being superseded by European glass beads and metal knives, such as those found at Brown (Finlayson 1998:4:Plate 4.5.110). However the invertebrate percentage was higher at Carton than Irving-Johnston and shell artifacts, particularly beads but also scrapers or knives, persisted into the late period. At Hamilton, shells were used as temper in a uniquely high proportion of the ceramics (64 percent). This led Lennox (1981:361) to propose an immigrant group of women potters, whose presence, in turn, was a result of increased conflict for control of areas with high beaver densities (cf. Trigger 1985:260). A very high percentage of invertebrates occurred at Bogle II which, according to Lennox (1984a:263), was contemporaneous with Hamilton. If Bogle II was a satellite village of Hamilton, as proposed by Lennox, it is possible that shells were collected at Bogle II to be used in the ceramics found at Hamilton. In general, the percentages of invertebrates in the faunal assemblages from the 13 sites show great variability and no trends over time. In fact, the earliest and the latest sites both have the highest invertebrate percentages. Perhaps the numbers of European goods which reached these Neutrals were too few to result in the abandonment of shell artifacts.

Conclusions

This study of the animal remains from 13 late pre-contact to post-contact sites has expanded our knowledge of the animals exploited by the Neutral. Building on Prevec and Noble's (1983) earlier synthesis, it is now evident that the Neutrals availed themselves of a very rich variety of species. This was most apparent for the bird bones which came from at least 54 species and the mammals which were from at least 32 species. The variety of fish was notable as well, with 23 species. Most of the local turtles were represented by nine species and there was even one foreign species. There was at least one snake represented and two species of amphibians. Invertebrate remains, while not showing as much variety, accounted for more than ten percent of the NISPs on five of these sites and this is higher than is generally true of Iroquoian faunal assemblages. The great variety of species in these Neutral faunal samples compared to other Iroquoian sites (Stewart 1999) probably reflects the location of Neutral sites within the Carolinian biotic zone, the most diverse and the richest biotic zone in Canada.

In this environment, Neutral communities made a concentrated effort to acquire members of the deer family, particularly the white-tailed deer, but also some wapiti and moose. Most of the large sites show an increase in the exploitation of mammals after 1630, and an increase in the proportion of deer remains within that class is evident at Walker and Hood. Obviously, as Prevec and Noble (1983) concluded, venison was often consumed by Neutrals. Did they also trade deer products to the Huron? Deer populations are known to be much denser in Neutralia than Huronia, both currently (Canada Land Inventory 1976) and in the past, according to Sagard (Wrong 1939:225) and Ragueneau (Thwaites 1896-1901:33:83). From Champlain's 1615 account, it is known that the Huron travelled long distances southward to hunt deer (Trigger 1990). It is also known from Jesuit accounts (Thwaites 1896-1901:21:203) that the Neutral did not trade directly with the Europeans but rather received European goods via middlemen, such as the Huron. Thus, it seems highly probable that Neutral traded deer products, such as skins but also possibly meat and/or rendered grease and perhaps even antler and bone as raw material or as finished artifacts. Finally, in support of this argument, it is known that Neutrals traded squirrel skins to the Huron (Thwaites 1896-1901:17:176, 243). The same trade networks could have been used to move deer products. A future study of deer elements found most frequently on seventeenth century Huron sites might clarify this idea that deer parts were transported into Huronia.

It has previously been suggested that a demand for grey squirrels increased after A.D.1615 (Prevec and Noble 1983). Evidence in this paper supports the idea that these small animals were hunted often by the Neutrals. However, the highest percentages for squirrels were at the earliest two sites. Thus, the exploitation of squirrels, and eastern chipmunks, likely for their furs too, occurred at least as early as A.D. 1540. The added evidence also indicates that squirrel hunting actually decreased over time, contrary to Prevec and Noble's (1983:) suggestion. This contradiction can be resolved by concluding that some Neutral communities were heavily involved in acquiring squirrels whereas others were not.

Following deer, dog, beaver, and black bear were the most important contributors to Neutral subsistence. Dog remains showed no pattern of change over time which in turn allows the supposition that game did not become scarce for Neutrals, as is reported for the Huron (Sagard 1866). The large percentage of *Canis* remains at Bogle I was unusual among the 13 sites. This could be an anomaly, considering the few faunal remains from this site, or it could be related to some undetermined special purpose for that site. Hunting with dogs is a possibility, but the other remains on this site do not provide corroborating evidence for this idea. Beaver remains were surprisingly few in the sites considered by Prevec and Noble (1983) who noted a decline in beaver representation over time. Among the additional sites used in this paper, the highest beaver percentage occurs at the early Metate site but, in general, beaver percentages are higher at these additional sites than at the sites originally considered by Prevec and Noble. Like deer, beaver was obtained often and might have been traded into Huronia where this valuable animal had been hunted to extinction by about A.D.1630 (Sagard 1866:585). Black bear remains, common on all these Neutral sites, would have provided large amounts of meat as well as warm fur coats. Racoon were discussed as being very important animals by Prevec and Noble (1983). The additional evidence confirms that racoons were ubiquitous, but their relativel low numbers make them seem less important to Neutral subsistence than previously supposed.

Fish, birds and turtles were much less common and less important meat providers. Amphibians and invertebrates appear to have been almost ignored at most sites. There are artifacts, however, which attest to the fact that invertebrates were not gathered solely for food. Among the birds, passenger pigeon and wild turkey were the species most heavily exploited with ducks, especially oldsquaw, being common at some sites. The variety of fish on these sites was considerable, but it can be concluded that the Neutral fished primarily local catfish, suckers, and wall-

eye/saugers, at most of the 13 sites, and lake fish, particularly whitefish, trout and lake sturgeon, at some sites. Consideration of the preferred habitats of the fish represented at these sites reveals that the people who were settled on rivers that flow into Lake Ontario fished from one of the Great Lakes, likely Lake Ontario, more than the people in those communities settled on the Grand River system fished from a large lake, likely Lake Erie. The latter fished more often from local, shallow waters.

A general reconstruction of the seasonal subsistence activities of the Crawford Lake communities is now possible. Considering the natural histories of the prominent fish and assuming they were taken when they would be easiest to harvest (Scott and Crossman 1973), it can be concluded that these groups fished suckers, walleye/saugers, and pike in the spring, catfish and sunfish in spring and through the summer, and whitefish and trout in the fall. Winter fishing is also a possibility. The fall fishery was concentrated on Lake Ontario, likely, whereas spring and summer fishing appears to have been primarily from rivers and streams. These fishing activities would have to be co-ordinated with hunting and horticultural demands. Wild turkeys were available year round but passenger pigeons could be taken locally from the end of March to mid-October only, and most of the ducks were fall and spring migrants, although oldquaw winters on the lakes. White-tailed deer could be taken most easily in the late fall, when they are also in their prime condition for weight and antlers, and in winter when they yard together. Bears are hunted with least risk in the winter. Beaver can be taken easily in winter, too, but would be attainable yearround and dogs were available on site continually. Pelts are thickest in the fall, making this the best season to hunt fur-bearers for their skins. Most hibernating animals, such as woodchuck and turtle, must have been taken in the warm weather months and clams were likely gathered then too. Crops of corn, squash, beans and tobacco would be planted in spring, tended over the summer and harvested in the fall. The collecting of wild fruits and nuts would occur over the warm season too, when there would have been some fishing and hunting. In sum, probably the main hunting period was the late fall and early winter whereas most fishing would have occurred from early spring to fall.

Site location, relative to the Escarpment and wetlands, has been shown to have influenced subsistence activities. People living above the Escarpment availed themselves of ducks, likely from the local marshlands, whereas people living below the Escarpment did not use this resource. Similarly, the people closest to the marshlands appear to have been able to concentrate more on beaver and muskrat than those people living below the Escarpment, but in both areas, white-tailed deer was the animal most often hunted. Sites closest to marshes or vacated villages and fields might have been at an advantage for deer-hunting. Conversely, it appears being situated above the Escarpment was not an impediment to lake fishing.

The differences in the animal frequencies at the 13 sites suggest hunting and fishing from specific areas rather than exploiting a common area. This supports the idea that sites and their populations, which are often grouped together under the term "Neutral", were distinct entities with separate territories for resource extraction. The diversity of animals exploited at the sites considered in this paper likely reflects proximity to various rich habitats. Although Bogle I and Bogle II were the less rich and diverse in their faunal remains, as is to be expected considering their small sizes, their assemblages were similar to those on the other sites. Deer remains predominated at these sites, although less so than at most of the others, with the exception of Thorold where the low deer representation can be attributed to greater distance from wetlands. The only unusual aspects of these two small sites were their high percentages for *Canis* sp. and invertebrates. These findings suggest that if Bogle I and Bogle II were constructed for a special purpose, it was not hunting or fishing. A main activity might have been collecting shells; otherwise there is nothing in these sites' faunal remains to indicate that they were anything other than small villages.

Changes in the faunal assemblages over time, particularly changes resulting from European

influences, have been considered. Racoon was slightly more frequent in the later sites, possibly reflecting trade with the Europeans, but beaver remains did not exhibit the expected increase in the post-contact period. Grey squirrel, which ranked highly at some sites, was represented less often in the post-contact Crawford Lake sites examined in this analysis. This, perhaps, reflects both a response to the European disregard for these small pelts and a specialization in these furs at some late sites. Contrary to evidence for some Huron sites (Latta 1976), the number of dogs on these Neutral sites does not appear to have increased over time which, in turn, suggests that wild meat sources continued to be sufficient. Among the mammals, white-tailed deer continually dominated Neutral hunting activities and presumably their meat diet, followed by beaver and black bear. The same continuity was found for passenger pigeons and wild turkey. The same turtle species were gathered infrequently over time and invertebrates fluctuated from site to site. Perhaps the most significant and surprising conclusion to be drawn from the comparisons made in this paper is that the Neutrals' main hunting and fishing activities appear to have changed little in response to the incursion of Europeans into southern Ontario.

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