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Zooarchaeological Literature in Northeastern North American: The Gulf of Maine as a Case Study

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ABSTRACT: Like most regions, northeastern North America has witnessed a growth in zooarchaeological literature over the past 30 years. The outlets for zooarchaeological data are varied and include a few prominent regional journals, museum monographs, edited volumes focusing on regional cultural developments, and numerous unpublished site reports. Typically, the regional journals have featured either site-specific or review articles that include faunal data and are ultimately aimed at advancing the culture history of the region. Edited volumes generally have the same focus, but rarely include faunal data that can be profitably used by other researchers in regional comparisons. Some of the best faunal data are included in site monographs, in theses, and in unpublished manuscripts housed in various state offices or museums, but these are not always easily accessible. As a case study within the region, the faunal literature for the Gulf of Maine is examined. In the past, zooarchaeology played a critical, although not always visible, role in the interpretation of culture history in the region. Major issues that have been addressed using faunal data include seasonality, the role of marine resources, transhumance, and contact. Over the past decade, significant contributions have also been made in methodology. Recently, a zooarchaeology research group was formed in the state of Maine in an effort to work collaboratively to increase the visibility and centrality of zooarchaeological research in the region.

KEY WORDS: ZOOARCHAEOLOGY, GULF OF MAINE, NORTHEASTERN NORTH AMERICA, ARCHAEOLOGY

RESUMEN: Al igual que el resto de las regiones, la norteamérica nororiental ha sido testigo de un crecimiento de la producción zooarqueológica durante los pasados 30 años. Los vehículos de difusión para esta producción son variados e incluyen unas pocas prestigiosas revistas regionales, monografías de museos, libros centrados sobre actuaciones culturales en la zona así como numerosos informes inéditos. Tradicionalmente, las revistas regionales han publicado informes concretos sobre yacimientos o revisiones con datos de fauna pero enfocadas a la resolución de problemas en torno a la historia cultural de la región. Los libros con frecuencia repiten este enfoque si bien raramente incorporan datos de fauna que puedan ser adecuadamente utilizados por otros investigadores en comparaciones interregionales. Algunos de los mejores datos de fauna están incluidos en monografías de los diferentes yacimientos pero también en tesis y en manuscritos inéditos y de difícil acceso depositados en distintos museos o departamentos estatales. Como paradigma de este panorama se examina aquí la bibliografía faunística referida al golfo de Maine. En el pasado, la zooarqueología desempeño un papel crítico, si bien no siempre visible, en la interpretación de la historia cultural de la región. Temas de interés abordados a través del análisis de la fauna incluyen los referidos a estacionalidad, el papel de los recursos marinos, la trashumancia y los contactos con los colonizadores europeos. A lo largo de la última década también se han producido contribuciones relevantes en temas metodológicos. Recientemente se ha formado un grupo zooarqueológico de trabajo en el estado de Maine para trabajar de modo integrado e incrementar la visibilidad y relevancia de la investigación zooarqueológica en la región.

PALABRAS CLAVE: ZOOARQUEOLOGÍA, GOLFO DE MAINE, NORESTE DE NORTEAMÉRICA, ARQUEOLOGÍA

INTRODUCTION

Like most regions, northeastern North America (which includes New England and the Maritime Provinces) has witnessed a growth in zooarchaeological literature over the past 30 years. The overall trends seen in the United States are generally reflected in the Northeast, but by focusing on the Gulf of Maine as a case study it is possible to look more closely at how zooarchaeology has developed in a particular region with specific research questions that can be addressed using archaeological faunal remains.

The first problem is defining the Northeast geographically (Figure 1). It is generally thought of as New England and the adjacent states and provinces, but how far north, west or south should be included? A key journal for the region, *Northeast Anthropology*, includes Pennsylvania, New York, New England, the Maritimes, Quebec and Ontario. A convenient label for the region, which appears in the literature, is the Maritime Peninsula (e.g., see Leonard, 1995: 20).

Another important issue is that the Northeast was formerly viewed as a cultural backwater with researchers trying, unsuccessfully, to fit the archaeology of the region into schemes developed for the rest of the eastern United States (see reviews by Snow, 1978; Dincauze, 1980). A body of literature exists on the issue of "marginality", and this was also addressed at the 1990 meetings of the Conference on New England Archaeology (Dincauze, 1993; Mrozowski, 1993; Robinson & Petersen, 1993). It is now recognized, however, that the Northeast has unique qualities and integrity as a region. This is especially true for the Gulf of Maine, as will be shown below.

Finally, it should be noted that the national boundary with Canada is artificial for archaeology and for faunal literature in the region. "Crossing the border" is a commonplace phenomenon, with some impressive zooarchaeology for the region appearing in the Canadian literature (see paper by Stewart, this volume).

THE GULF OF MAINE AS A REGION

The Gulf of Maine is a body of water bounded on the north by Nova Scotia and on the south by the hook of Cape Cod in Massachusetts (Figure 1). Because it is 70% enclosed by the New England and Canadian land masses, it has been called "a sea beside a sea" (Lignell, 1986). Glacially etched river valleys that generally run from north to south feed the rocky coastline, and the Bay of Fundy, located in the northeast part of the Gulf of Maine, contains the highest tides in the world. The political boundaries include Massachusetts, New Hampshire, Maine, New Brunswick and Nova Scotia. In this review the state of Maine, which comprises the central and largest portion of the Gulf of Maine, will be used as an example of the region. If the coastline along this portion of the Gulf of Maine were stretched out in a straight line, it would reach over 5000 km.

The region is unique for a number of reasons. The Bay of Fundy contains the highest tides in the world, measuring over 16 m in amplitude. The terms "dynamic" and "productive" are often used to describe the rich fishing grounds and the coastal and marine resources. Only four other maritime areas on earth are as productive: the seas off Japan, the western coast of South America, parts of West Africa and parts of Northern Europe (Bombard, 1986). The region also supports a highly diverse terrestrial fauna including moose, deer, bear, beaver and many other small furbearers.

The marine resources include various fish, seal, migratory birds, and, most significant for archaeology, shellfish. The shellfish are responsible for the numerous shell middens, the archaeological sites that are so characteristic of the Gulf of Maine coastline. These shell middens are highly visible, and in 1868 Jeffries Wyman, the first Director of the Peabody Museum at Harvard, compared them to the *kjoekkenmoeddings* (kitchen middens) of Danish archaeology in the published literature (Wyman, 1868; Spiess, 1985). Excavation of these shell midden sites began in the nineteenth century, but during the past 20 years, an ongoing body of literature has emerged that addresses the formation processes and taphonomy of shell middens in the Gulf of Maine region (see Brennan, 1981; Sanger, 1981; Spiess, 1988; Stein, 1992; Bourque, 1996; Dincauze, 1996; Sommer, 1997).

In terms of zooarchaeology, the coastal shell middens are significant because conditions are optimum for the preservation of faunal remains. This contrasts with sites in the interior where preservation is poor due to acidic soils, and bones are preserved only as small, calcined fragments (Spiess, 1992). Despite this difference in preserva-

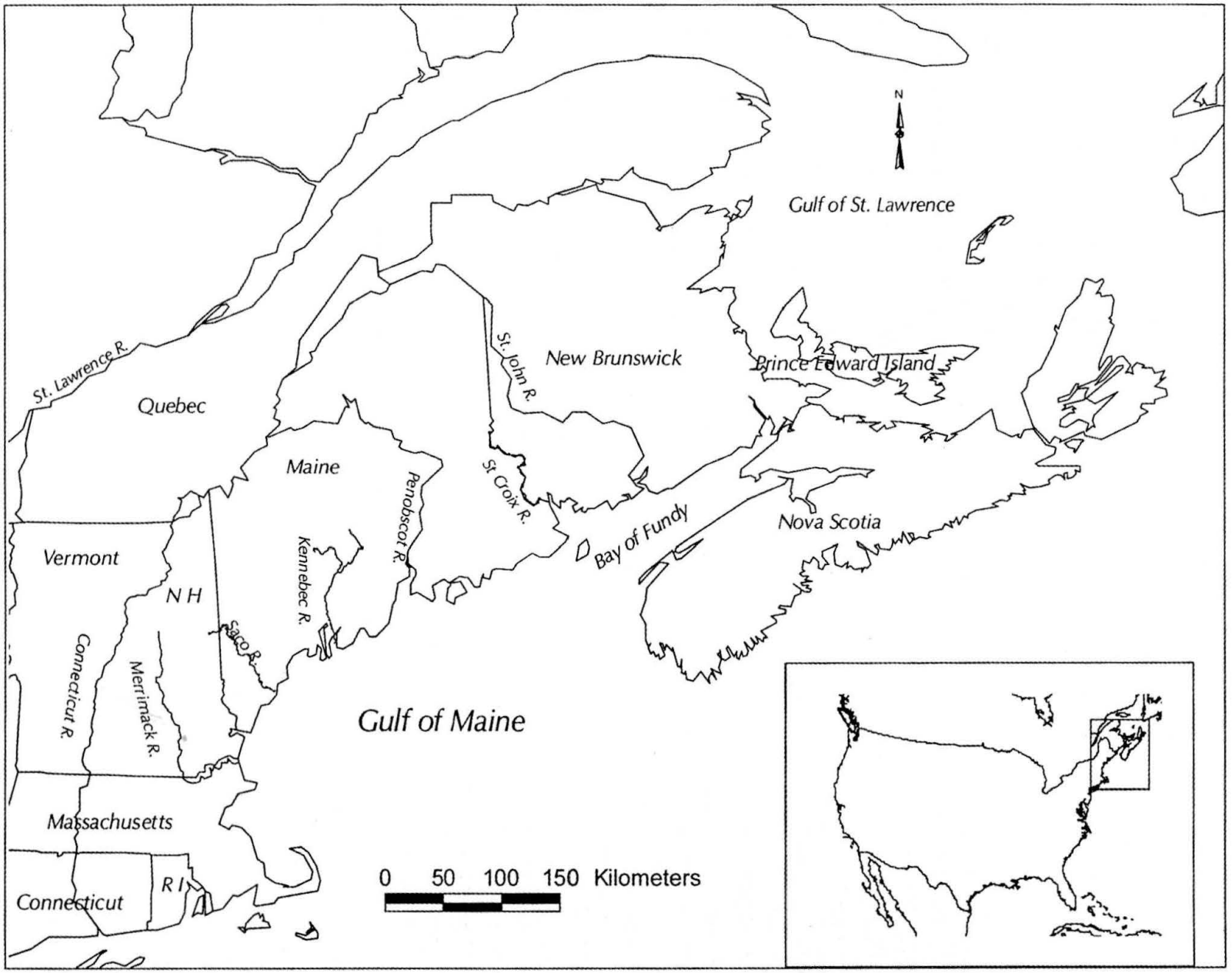

FIGURE 1
Map of the Gulf of Maine and the Maritime Peninsula.

tion, some notable zooarchaeological research has been conducted on interior sites. One such study is Knight's (1985) work on the calcined beaver bones from Hirundo. His actualistic study of crushing loads of various beaver skeletal elements is a significant contribution in the area of taphonomy, which was subsequently used by Crader (1997) in a study of beaver bone representation at the Richards site.

MAJOR RESEARCH ISSUES

Over the past 30 years faunal remains have played a critical, but not always visible, role in archaeological research in the Gulf of Maine. This is a peculiar situation given that there are several major research issues for the region that can be directly addressed using faunal data. It is understandable and partially explainable, however, due to the history of archaeology in region (see Spiess, 1985). Although there were a significant number of excavations and connections between Maine and the Peabody Museum at Harvard, there was a lack of formal institutional commitment to archaeology in the state of Maine until 1966, when Dean Snow was hired by the University of Maine at Orono. Snow was the first full-time, professional archaeologist employed in Maine, so sustained research in archaeology has only been underway in the state since about 1970 (Spiess, 1985).

There are several major research issues for the Gulf of Maine that can be addressed using faunal data as outlined below.

1. *The seasonality of sites*. Patterns of resource use based on seasonal availability can be determined by seasonal indicators on certain species in the region such as medullary bone in birds, growth rings on softshell clams, and cementum annuli on mammal teeth. The literature for the region contains important contributions to faunal methodology in the 1980s and 1990s, such as methods for determining season of death based on growth rings on teeth, and measurements for distinguishing the extinct sea mink (e.g., see Bourque *et al.*, 1978; Spiess & Hedden, 1983; Chase, 1988; Spiess, 1990; Mead *et al.*, 2000).

2. *The role of marine resources vs. terrestrial resources*. This raises a host of other related issues including the different subsistence technologies required for different species (for example, clams vs. deer), whether there were changes through time in the diet (such as more or less diversity), and the use and biogeographic distribution of extinct species, such as the great auk and sea mink.

3. *Transhumance and contact*. Beginning in the 1970s, workers noticed discrepancies between ethnohistoric documents (which indicated native peoples spent the summers on the coast) vs. archaeological evidence (which suggested the coast was occupied during the winter and early spring) (Sanger, 1971, 1982; Bourque, 1973). Given the potential of zooarchaeological data to contribute to understanding settlement patterns in the region, the lack of much detailed faunal work until recently is notable. Also, in keeping with post-processual trends in the United States, there have been recent analyses of ethnicity, social organization and trade networks using ethnohistoric accounts in relation to zooarchaeological data (Crader & Hamilton, ms.; Stewart, 1989; Sanger, 1996).

Over the 30-year period under review here, zooarchaeological research in the Gulf of Maine has certainly evolved. It has changed and challenged existing models, models which have sometimes been proposed without any supporting zooarchaeological data. Thus, zooarchaeology has an important role to play in understanding regional patterns as major recent work during the last 15 years has shown (for example, see Carlson, 1988; Stewart, 1989; Bourque, 1995; Sanger, 1996; Crader, 1997; Kerber, 1997; Spiess & Lewis, 2001).

FRAMEWORK FOR THE HISTORY OF ZOOARCHAEOLOGY

The starting point for the faunal literature of the region is a pair of volumes edited by Bogan & Robison (1978, 1987) published nine years apart (Figure 2). These were titled, respectively, *A History and Selected Bibliography of Zooarchaeology in Eastern North America* (1978) and *The Zooarchaeology of Eastern North America: History, Method and Theory, and Bibliography* (1987). Both volumes contained extensive bibliographies of zooarchaeological references arranged into categories such as Invertebrates, Domestication, Butchery, and so on, with Taphonomy being added to the 1987 volume. Although extremely useful, the geographic focus was primarily the Southeast.

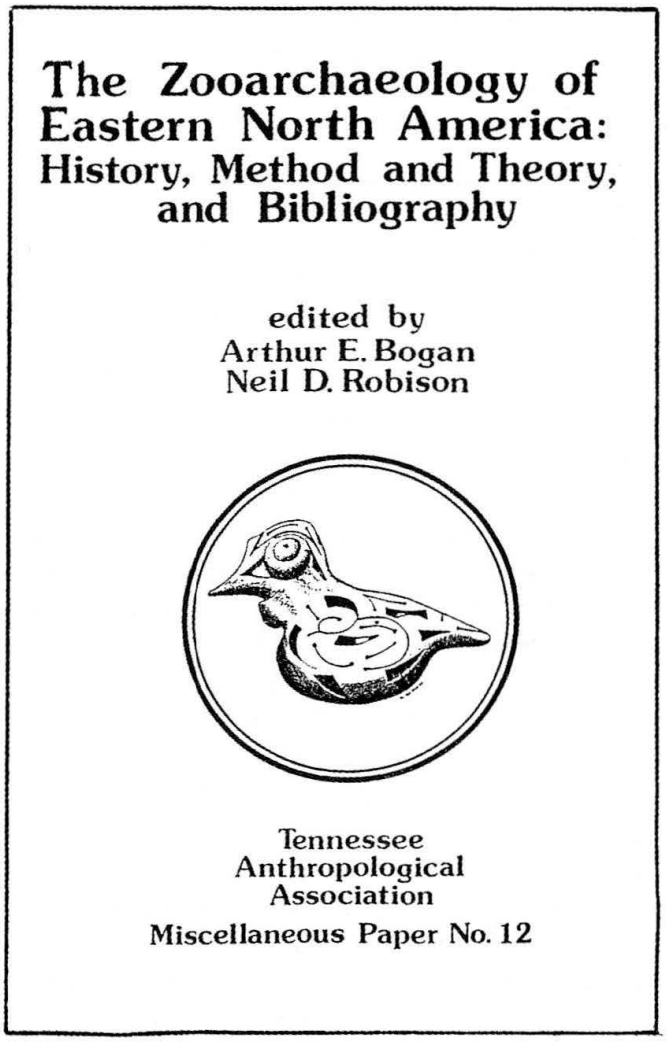

FIGURE 2
Cover of Bogan and Robison's second volume on the zooarchaeology of eastern North America (1987). (Reproduced with permission from the Tennessee Anthropological Society).

In these volumes Robison (1978, 1987) included an essay on the history and development of zooarchaeology in eastern North America in which he outlined three major periods of research according to time and methodological approach. These were:

1. THE FORMATIVE PERIOD (late 1860s to early 1950s). This is clearly before the time period that is the focus of this paper, but it deserves mention here because one of the very few key early references for all of eastern North America is from the Gulf of Maine. This is the classic work of Loomis and Young, titled "On the Shell Heaps of Maine", which was published in the *American Journal of Science* in 1912. This was a time when there was not much interest and no specialists in zooarchaeology, but Robison (1987: 3) notes that Loomis and Young "*were not to be equaled until the Systematization Period, approximately 40 years later*", and their paper "*still stands out as one of the foremost zooarchaeological studies prior to the work of T.E. White in 1952*" (published in *American Antiquity*).

What was so astonishing about the work of Loomis and Young? It seems almost trivial now, but their data presentation was especially noteworthy, as a few examples discussed by Robison (1987) illustrate. All of the fauna was identified to the species level by number of specimens (the modern-day NISP), and these were then tabulated and presented in chart form. As Robison (1987: 3) notes, this was a first in the field of zooarchaeology. They then used species frequencies to speculate about relative dietary importance, and they attempted to reconstruct seasonality based on 52 male deer crania with shed antlers (spring). Their article also contained beautiful, meticulous drawings of specimens, some even showing butchery marks (Figure 3). None of this is unusual today, but it was quite astonishing for 1912. Finally, of particular interest to the 1998 ICAZ meetings, their study of dogs from Maine shell middens "*predates and may have been the source of inspiration for Allen's classic, 'Dogs of the American Aborigines' (1920)*" published by the Museum of Comparative Zoology at Harvard (Robison, 1987: 3). This seems likely because, according to Robison (1987), Loomis and Young described the dogs from the shell heaps in Maine using terms similar to those that would later be used by Allen (1920).

2. THE SYSTEMATIZATION PERIOD (early 1950s-1969). This is also before the time period under review here, but it is mentioned for historical interest. During this time there was an increased interest in functionalism and cultural ecology. Zooarchaeology became more systematic, meaning there was an increase in the number of faunal studies, and work was presented in a standardized way using tables, MNI, and so on.

3. THE INTEGRATION PERIOD (1969-XX). This period is characterized by an increased interest in entire lifeways and systems of adaptation. During this time zooarchaeological research became *integrated* into archaeological research and writing, rather than just being attached as appendices at the end of site reports. Robison (1987) uses 1969 as the beginning of this period because, he says, it took that long for the interdisciplinary approaches of the "new archaeology" of 1960 to be of benefit to zooarchaeology. Faunal data began to be seen as being central to formulating and answering research questions, and it became part of

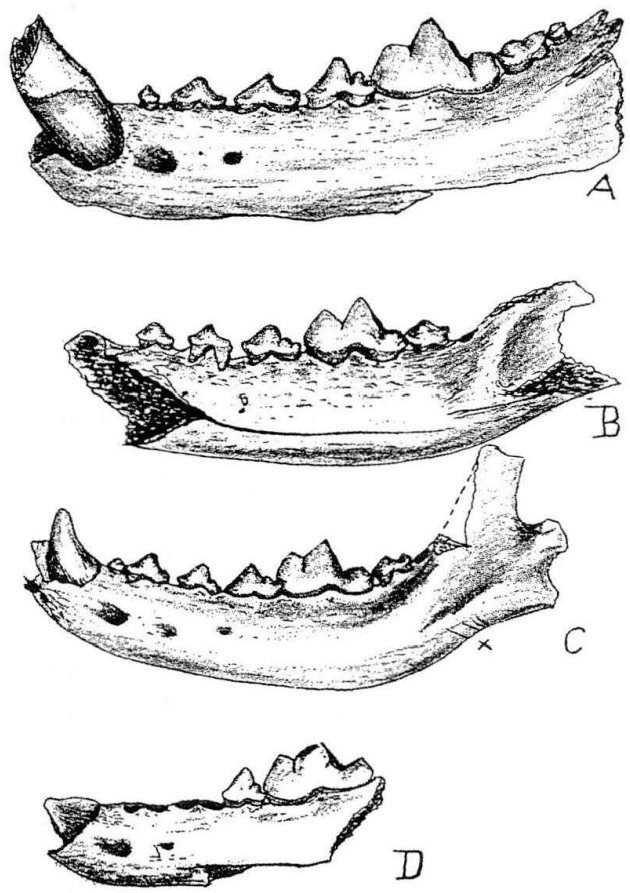

FIGURE 3
An example of the drawings published in Loomis & Young's 1912 paper "On the Shell Heaps of Maine." These appeared as fig. 4 with the caption: "Figures of the lower jaws of–A the wolf, B the major Indian dog, C the common Indian dog, and D the minor Indian dog; all 1/2 natural size. The marks on the back of the common dog over x are tool marks". (Reprinted with permission from the *American Journal of Science*).

the approach of the "new archaeology" to integrate flora, fauna and material culture to reconstruct the past. Robison (1987) also notes that during this period zooarchaeology matures, that is, techniques, methods and assumptions are critically examined.

It should be noted that this date (1969) roughly coincides with the beginning of sustained, long-term archaeological research in the Gulf of Maine region, stimulated by the hiring of Dean Snow by the University of Maine. It is interesting that although Robison's (1987) Integration Period begins in 1969, the Northeast seemed to lag behind a bit, using mainly non-integrated approaches until the1980s when there was a breakthrough in the literature, as will be shown below.

LITERATURE REVIEW

For the region, there are three major types of literature sources for zooarchaeological research: journals, books/monographs, and various unpublished sources. Each of these is briefly reviewed below. Although this review focuses on regional publications, it should be noted that zooarchaeological research on the Northeast and the Gulf of Maine also appears in national publications in both the United States and Canada, for example, in *American Antiquity, North American Archaeologist*, and the *Canadian Journal of Archaeology*.

JOURNALS: There are two major regional journals, *Archaeology of Eastern North America* and *Northeast Anthropology* (formerly *Man in the Northeast*), both of which first appeared just over 25 years ago. *Archaeology of Eastern North America*, a product of the Eastern States Archaeology Federation (ESAF), was first published beginning in 1973. Geographically, this journal includes the entire eastern seaboard, but it does feature the Northeast. From the outset, it has served as an important outlet for publications by major figures in Northeast archaeology such as Dean Snow, William Ritchie, Dena Dincauze, David Sanger and Robert Funk, among others. Many issues of this journal are thematic, focusing on topics such as Palaeo-Indians, ceramics, or fluted points, but not yet on faunal remains. A real contribution to the literature would be made if a future issue focused on zooarchaeology.

A systematic review of all of the issues of *Archaeology of Eastern North America* generated a "Where's the fauna?" reaction for the earlier issues. In fact, the evolution of zooarchaeological research in the Northeast can be seen quite well in this journal, and it will be used to illustrate trends for the region as a whole over the past 30 years.

The first faunal article published by this journal appeared in 1974. It was a short descriptive piece by Richard S. White, Jr., titled "Notes on some archaeological faunas from Northeastern North America". According to White (1974: 67) the purpose of his paper was to "*report upon several small collections of archaeological faunal materials that have been submitted to me for identification during the past year. None of the collections is large enough to warrant a separate report; the several faunas together constitute an important body of data*". Thus, the faunal data from five sites

were published together because, the justification went, there was not enough data to publish them singly. Despite this first "fauna" article, the 1970s were generally devoid of zooarchaeological publications, or faunal remains were only mentioned in passing, as in the article by Lenik (1977) on Spirit Pond. Only the total number of specimens was given (not by species), occasionally with some indication of their relative importance, but there was no real quantification. As noted above, Robison's (1987) Integration Period begins in 1969, but publications in this journal continued to involve non-integrated approaches until a breakthrough was made in the 1980s.

In 1981, a pair of papers on shell midden faunal remains, one by Brennan (1981) and the other by Sanger (1981), appeared in this journal, ushering in a new phase in zooarchaeological publication for the region. Brennan's (1981: 46) paper contained the statement: "*for too many years we had...paid too little attention to the bone recovered*". Sanger's (1981) paper, titled "Unscrambling Messages in the Midden", addressed issues of taphonomy and bones in shell midden sites, and initiated an ongoing discussion of site formation processes.

By the 1990s, zooarchaeological literature on the Northeast and Gulf of Maine seems to have caught up with current trends in the United States, where faunal work is at the center of archaeological research, and entire articles are focused on faunal remains. An example is Alfonso Rojo's (1990) article on fish remains from Cellar's Cove, Nova Scotia, where subsistence patterns focused on fishing are reconstructed using cod remains. More recent issues of the *Archaeology of Eastern North America* contain faunal-related articles on post-processual concerns, such as symbolism and ethnohistory, as evidenced by Kerber's (1997) "Native American Treatment of Dogs in Northeastern North America". In addition, a recent article by Sobolik & Will (2000) focuses on calcined turtle bones from the Little Ossipee North site and includes taphonomic experiments on turtle bone shrinkage. In general, there has been an overall increase in the number of zooarchaeology articles published during the last ten years, with two of the seven articles in both the1990 issue and the 2000 issue focused on faunal remains.

The other major regional journal, *Man in the Northeast*, was first published in 1971 by the Anthropological Research Center of Northern New England. It was founded and edited by Howard Sargent (1971-1984), and later by Dean Snow (1984-1995), then Richard Wilkinson (1995-1999), and currently by Charles Cobb. It was closely identified with The State University of New York at Albany, although it recently moved its headquarters to Binghamton, and it is recognized as *the* regional journal for Northeast archaeology.

The introduction to the first issue came with a letter from the editor, Sargent (1971), questioning whether another regional journal was really necessary and acknowledging that it might be met with skepticism that "yet another journal" was being published. At the same time the claim was made that manuscripts were ready for an "energetic and expanding discipline", and that there was a real need for communication among researchers dealing with problems of a *regional* nature.

An interesting feature of this journal was its cover (later changed) which symbolized the two populations who dominated the region in late prehistoric and early historic times (Figure 4). The lower left motif was a wampum belt of the Five Nations Iroquois, and to the "northeast" there appeared the double curve motif of the Montagnais, Algonkian speakers of Quebec and Labrador (Sargent, 1971). This stands as a reminder that although the journal is published in the United States, the national boundary with Canada is not relevant when considering past regional adaptations.

During the 1970s, *Man in the Northeast* showed the same general pattern already described for *Archaeology of Eastern North America:* very little on faunal remains was published. However, in 1973, Bourque's paper on "Aboriginal Settlement and Subsistence on the Maine Coast" appeared. It was this paper that questioned the seasonal (summer) occupation of coastal sites in the Gulf of Maine which had been suggested by ethnohistoric documents. Archaeological evidence was beginning to suggest that the coast was occupied during the winter and early spring, and although seasonality is an issue that could be directly addressed using faunal data, there was little published zooarchaeological data available at that time to support Bourque's ideas. The publication of this paper actually set the stage for future zooarchaeological work.

Indeed, fifteen years later, by the late 1980s and early 1990s, significant advances in zooarchaeological literature for the region are quite apparent in this journal. One example is Frances Stewart's

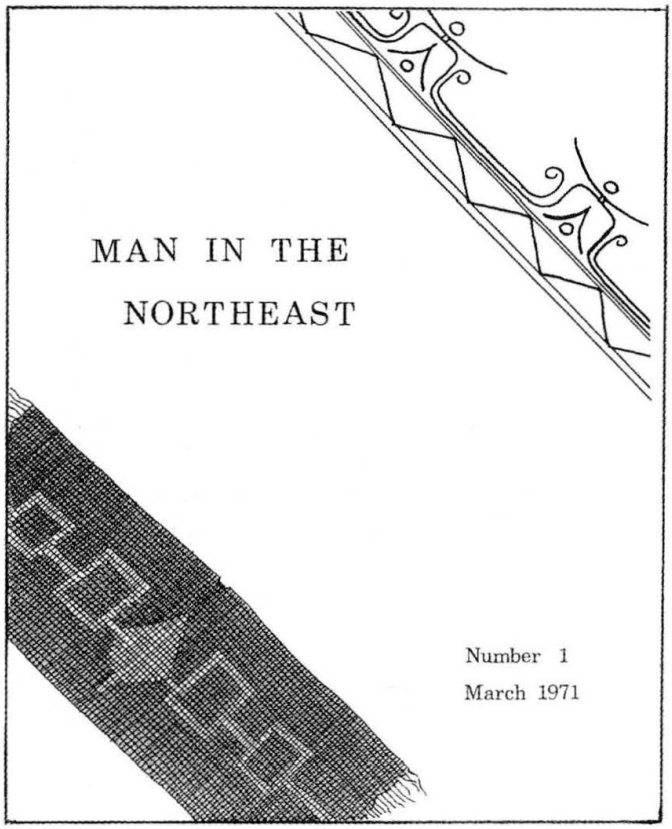

FIGURE 4
Cover of the first issue of *Man in the Northeast*, showing symbols of the Iroquois and the Montagnais, two populations who dominated the region in late prehistoric and early historic times. (Reprinted with permission from *Northeast Anthropology*, the current name of this regional journal).

(1989) paper titled "Seasonal Movements of Indians in Acadia as Evidenced by Historical Documents and Vertebrate Faunal Remains from Archaeological Sites". This is a significant contribution that uses vertebrate faunal remains from archaeological sites in New Brunswick and Nova Scotia to argue that ethnohistoric documents suggesting winter habitation of the coast are inadequate and even incorrect for parts of the central and southern Gulf of Maine (seasonality for the northeastern Maritimes is opposite that for the southwestern Maritimes). This pattern may reflect possible subsistence differences between ancestral Micmacs and Maliseet-Passamaquoddys.

In 1993, the name of this journal was changed from *Man in the Northeast* to *Northeast Anthropology*, apparently in an attempt to remove gender bias from the title. Although the title of the journal is *Northeast* ***Anthropology***, its focus has always been **archaeology** because the idea for it was born during two regional conferences on northeastern archaeology. However, there was a clear statement in the first issue (Sargent, 1971: 5-6) that research must combine linguistic, ethnohistorical and archaeological data, so that *"the province/state editors are regarded first as anthropologists — second as specialists"*. This is characteristic of archaeology as practiced in North America: it has always been considered part of anthropology, differing from the European structure where anthropology and archaeology are traditionally separate academic departments. It should also be noted that the Spring 1995 issue was devoted to publishing papers from the 1993 annual meetings of the Canadian Archaeological Association, demonstrating again the regional connections between the United States and Canada.

During the rest of the 1990s some very important zooarchaeological articles appeared in this journal which (1) contribute to reconstructing regional patterns (2) address issues of taphonomy and methodology, and (3) reflect post-processual trends in North American zooarchaeology in general (social organization, social connections of regional groups, ethnohistory, ethnogenesis). An example of the latter is David Reader's (1998) article titled "Early Recent Indian Interior Occupation at Deer Lake Beach: Implications for Theories of Recent Indian and Beothuk Resource Use, Settlement, and Social Organization in Newfoundland". In this paper faunal remains (beaver and caribou) are used in conjunction with changes in house construction to suggest decreased mobility and changes in intensity of exploitation of interior resources. This is an excellent example of weaving the various threads of archaeological evidence together, including faunal remains, to reconstruct seasonality and social activities.

Besides these two major regional journals, there are a number of smaller subregional journals where faunal data are published. These journals are primarily the products of state archaeological societies. An example is the *Maine Archaeological Society Bulletin*, which first appeared in 1964 simply as sheets of paper stapled together, but which is now a substantial publication that appears twice a year. Sanger's (1985) paper on Passamaquoddy Bay sites, one of the first to present raw faunal data in addressing the issue of seasonal occupation of the coast, was published in this journal. Other subregional journals include *Bulletin of the Massachusetts Archaeological Society, New Hampshire Archaeologist, Bulletin of the New York State Archaeological Association* and *Pennsylva-*

nia Archaeologist (the latter of which published Guilday et al.'s classic paper on butchery at the Eschelman site in 1962). These subregional journals generally contain state-oriented research, such as site reports of local excavations, and they tend to be lithic-oriented although occasionally some important faunal data are reported.

BOOKS, MONOGRAPHS AND SPECIAL PUBLICATIONS: A second major source for zooarchaeological publications on the Gulf of Maine region are various books, monographs, series, or special publications. These include both edited volumes and single or co-authored works. The purpose of these is generally to advance the culture history of the region or to reconstruct regional adaptations.

One example of a monograph-length series is "Occasional Publications in Maine Archaeology" published by the Maine Historic Preservation Commission and the Maine Archaeological Society, with occasional other sponsors. In 1983, they published Spiess and Hedden's monograph *Kidder Point and Sears Island in Prehistory,* which made a significant contribution in the area of zooarchaeological methodology. In this monograph Spiess & Hedden (1983) spelled out "Analysis Methods" for every species found archaeologically in the Gulf of Maine, from vertebrates to shellfish. This publication set the standard for others working in the region, and it is still used as a reference by other zooarchaeologists. For example, Crader (1997) adapted computer codes for body parts (see Gifford & Crader, 1977) to their body part descriptions. Two other examples from this series are Robinson *et al.*'s (1992) monograph on *Early Holocene Occupation in Northern New England,* an edited volume that contained Spiess's (1992) important paper on Archaic Period subsistence, and Cranmer's (1990) monograph on the site of Cushnoc, which contained some of the rarely reported faunal data for early historic sites in the Gulf of Maine.

Local and regional museums also publish monographs that contain faunal data. The Abbe Museum, located in Acadia National Park, Bar Harbor, Maine, is a private museum that sponsors excavations, displays archaeological exhibits and publishes occasional monographs or bulletins, some of which contain faunal data as part of site reports. In 1994, they republished Butler and Hadlock's classic *Dogs of the Northeastern Woodland Indians* which was originally published in the *Bulletin of the Massachussetts Archaeological Society* in 1949. In addition, the R. S. Peabody Museum of Archaeology, located in Andover, Massachusetts, publishes occasional monographs that have been especially important for the Gulf of Maine, including reports on early excavations in Maine, such as Byers' (1979) monograph on the Nevin site.

Numerous other books, both edited volumes and single-authored works, focus on the region and contain zooarchaeological data. Examples of edited volumes include Nicholas' (1988) *Human Holocene Ecology in Northeastern North America,* which contained Carlson's (1988) paper on salmon remains in New England, and Stoltman's (1993) *Archaeology of Eastern North America: Papers in Honor of Stephen Williams,* which contained Spiess's (1993) paper on caribou, walrus and seals. It is interesting to note that earlier Dean Snow's (1981) volume, *Foundations of Northeast Archaeology,* contained papers on paleoenvironment, cultural adaptations, models, and human osteology, but no papers specifically on the fauna of the region.

Several important single-authored books have contributed to the zooarchaeological literature of the region, but not in terms of usable data until recently. Earlier contributions include William Ritchie's (1969) *Archaeology of Martha's Vineyard* and Dean Snow's (1980) *The Archaeology of New England,* which was the first book-length attempt to synthesize New England prehistory since Willoughby's (1935) *Antiquities of the New England Indians.* Snow's (1980) book is primarily a text for advanced undergraduates, graduates or educated laypeople, and unfortunately it focuses geographically on New York, despite its title. A major, recent contribution is Bruce Bourque's (1995) book on excavations at the Turner Farm Site, titled *Diversity and Complexity in Prehistoric Maritime Societies: A Gulf of Maine Perspective.* The faunal remains for the site were analyzed by Spiess and Lewis (1995), and the results were included in the book as an appendix with details. This "appendix approach" is reminiscent of faunal publications prior to Robison's (1987) Integration Period (which begins in 1969; see previous discussion), although Bourque does attempt to integrate the results of the analysis into his discussion of the site. The full details of the faunal work on the site recently appeared separately as *The Turner Farm Fauna: 5000 Years of Hunting and Fishing in*

Penobscot Bay, Maine, a major monograph published jointly by the Maine Historic Preservation Commission, the Maine Archaeological Society and the Maine State Museum (Spiess & Lewis, 2001).

UNPUBLISHED WORK: Finally, numerous unpublished works are a third major source of zooarchaeological literature for the region. These exist either as reports written in conjunction with contract work or with matching grants, or as theses written at academic institutions. Unpublished reports include those written as part of cultural resource management projects for the Maine Historic Preservation Commission and the Department of the Interior, National Park Service (e.g., see Petersen, 1986). These are primarily descriptive reports, but they do tend to follow the major trends in archaeological research and writing over the past 30 years. The Maine Historic Preservation Commission, located in Augusta, Maine, publishes annually a list of manuscripts on file, including contract work and collaborative work among archaeological field schools of some campuses of the University of Maine system. Some of these unpublished reports are substantial pieces of writing (over 300 pages), involving multiple authors and some interesting zooarchaeological data (e.g., see Hamilton *et al.*, 1991). Similar work is also available through other institutions such as the Peabody Museum at Harvard.

Graduate theses (Master's and Ph.D.'s) written at academic institutions in the region are a final source of unpublished zooarchaeological literature. In the state of Maine there are currently only two graduate programs in archaeology: at the University of Southern Maine, in connection with the American and New England Studies Program (historic archaeology), and at the University of Maine at Orono, through the Institute for Quaternary Studies. The Institute for Quaternary Studies is an interdisciplinary program, begun in 1972, which has been the source of some excellent Master's theses on zooarchaeological methodology, including actualistic studies, during the past 20 years. These include theses by McCormick (1980) on faunal analysis, by Will (1981) on bone tools, by Hancock (1982) and Chase (1988) on seasonality methods using fauna, by Knight (1985) on calcined beaver bones, and by Carlson (1986) on fishing strategies. More recently, Sommer's (1997) thesis on the fauna from the Todd site is a significant contribution in the areas of taphonomy and changes in faunal exploitation through time.

Other state and private universities with graduate programs in archaeology are potential contributors to the zooarchaeological literature for the region. During the 1970s for example, joint field schools on Martha's Vineyard were held between the University of Maine at Portland-Gorham (now the University of Southern Maine) and the University of Massachusetts at Amherst, which resulted in theses and site reports (e.g., see Perlman, 1976). Harvard University, on the other hand, has thus far not produced much significant zooarchaeological work on the Gulf of Maine. One exception is David Braun's (1972) Bachelor's thesis on "Prehistoric Adaptation to the Boston Harbor Environment", which made methodological contributions on excavation techniques, flotation, and faunal analysis.

CURRENT DIRECTIONS AND FUTURE WORK

Zooarchaeological research and literature in the Gulf of Maine is becoming increasingly prominent. In 1994, a faunal working group was formed by six professional zooarchaeologists working in the state of Maine (Figure 5). The group, whose main purpose is to focus attention on zooarchaeology in the Gulf of Maine, meets periodically for a variety of activities. Members of the group (which was initially formed through the efforts of Kristin Sobolik at the University of Maine, Orono) view zooarchaeological research as central to archaeological inquiry. By highlighting and centralizing faunal research, the intent is that other archaeologists in the region will come to appreciate that zooarchaeologists are also research archaeologists, not just technicians to turn to when faunal identifications are needed.

Activities of the group are highly varied. Members have conducted tutorials on methodologies, for example one on tooth sectioning by Arthur Spiess and one by Kristin Sobolik on turtle identification, following publication of her turtle atlas (Sobolik & Steele, 1996). The group has also collaborated on the faunal analysis for one site (Indiantown Island, Boothbay, Maine) by participating in the excavations and then analyzing the fauna, dividing up the work by our various specialities. The

FIGURE 5
Four members of the Maine faunal working group. From left to right: Art Spiess, John Mosher, Gerry Bigelow and Kristin Sobolik. Members not pictured: Rick Will and Dinah Crader.

results were originally part of an unpublished site report (Wilson, 1998), but recently a substantial multi-authored manuscript has been completed for publication (Spiess *et al.*, 2001).

The group is also involved in what it calls the "Zoogeography Project" aimed at documenting the presence of various species through time in the Gulf of Maine. This work was prompted several years ago by the quality of the Maine faunal data that appeared on the Illinois State Museum's FAUNMAP web site. Only four sites for Maine were listed, but the faunal group knew that there were over 240 sites in the Casco Bay Region alone (near Portland). Thus, the group began documenting species geography in the Gulf of Maine from published work and other available literature, generating species distribution maps using databases and GIS (Geographic Information Systems). The group also met with the Maine Department of Inland Fisheries and Wildlife about this project, due to their interest in species distributions through time. They are interested in zooarchaeological data because they are continuously faced with issues concerning several species, especially reintroduction schemes such as those proposed for wolf and salmon. Although the Maine Department of Inland Fisheries and Wildlife has data on *recent* species distributions and demography, only zooarchaeologists have produced information on past distributions of these species through the analysis of fauna from archaeological sites. These data are vital to making informed decisions about reintroduction schemes.

In 1996, zooarchaeological work in the Gulf of Maine was also featured in one local public television special on species ecology and conservation. Thus, faunal work and research in the Gulf of Maine is getting more recognition as it continues to make important contributions to zooarchaeology in the United States.

Over the 30-year period under review here, zooarchaeological literature and research in the Gulf of Maine has certainly evolved. It has changed and challenged existing models, models that were sometimes proposed without any faunal data. Major contributions in the area of methodology have come from the faunal literature on the Gulf of Maine, and researchers in the region are now in a good position to continue to make significant contributions in the future.

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