

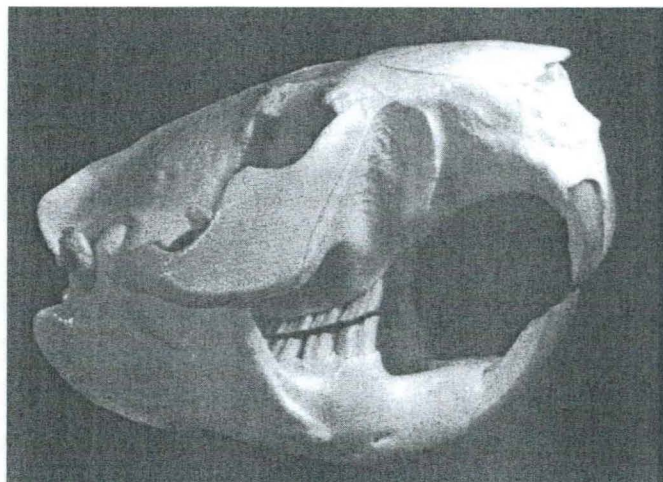


# Gnawing Desire: The Role of Beavers in Prehistoric Culture

Scott Jones, 2001

*"Beaver workings are probably second only to the workings of man in the changing of the ecology of a region."*

-Leonard Lee Rue III, in *The World of the Beaver*



## Beavers in the Southeast

The beaver - *Castor canadensis* - largest native North American rodent, much maligned by timbermen, trapped to near-extinction by fur trappers, is, next to fire and human actions, one of the premier agents of landscape and habitat alteration on this continent. Few other animals (excepting people) are so capable of modifying and manipulating their surroundings as is the beaver. Their actions also create wetlands where none existed before. In upland areas, beaver-generated wetlands have long been neglected by archaeologists as influencing factors for prehistoric culture. This article presents some of the key observations about the potential for human use of habitats created by beavers in the southeast.

A large adult beaver (here in the southeast) weighs in at about 60 pounds. A quick look around a beaver pond will attest to the extensive damage that modern beavers are capable of inflicting on large trees. The Ice Age beaver, *Castoroides*, weighed an estimated 400 pounds, and possibly as much as 800! While little is known about the habits of *Castoroides* (i.e., whether it built dams and ponds like our modern species), this rodent was capable of some serious timber-munching.

In more recent times, beavers were trapped extensively for the fur trade during the early years of American colonization. The extent to which Native Americans utilized beavers prior to European contact is not well known, but the economic forces that caused the near wholesale extirpation of beavers in the 1800's differed considerably from those of prehistoric

times. Yet reintroduction efforts during the 1920's through the 1940's were largely successful, and beaver numbers are on the rise. Their increased numbers are approaching - and may already exceed - population levels of prehistoric times. The virtual dearth of beaver during the formative years of American archaeology may be in part responsible for the lack of recognition that they have received as potential agents of human culture change.

The recognition of the importance of beaver ponds as a resource is not new among modern primitive skills practitioners. Early in my career as a primitive technologist I was introduced to the utility of beaver-cut sticks for tools, handles, and firewood by Steve Watts (Schiele Museum of Natural History, Gastonia, NC and SPT president). Watts' inspiration came from John White of the Ancient Lifeways Institute in Michael, Illinois. Having myself grappled with the complexities of woodworking with stone tools, the usually thankless (and often maligned) work of beavers was elevated in my mind to a status worthy of recognition. Two factors further influenced my ongoing interest in beavers and their effect upon culture and environment: First, my involvement with indigenous horticulture in recent years forced me to address problems of land clearing, site location, and other associated issues. The second factor - and perhaps most influential - is that I have had the opportunity to watch a beaver pond develop in my front yard.

In the southeast (and elsewhere, I daresay) beavers don't make a serious effort to dam rivers and major streams. In these large bodies of water, they utilize oxbows and sluggish backwaters for habitation, and frequently build bank dens instead of conical lodges. Also, the terrain affects beaver activity. The flat topography and slow, meandering streams and rivers of the Coastal Plain in the South provide little incentive or opportunity for beavers to create the extensive wetlands that they aggressively construct along streams of the hilly upland Piedmont. In the Piedmont, major rivers are separated by an average of about 20 miles, with the intervening uplands characterized by small dendritic streams coursing through relatively narrow valleys. Without beavers, this is an environment poor in wetlands, with river and stream gradients too steep to favor the natural formation of oxbows and backswamps.

In recent years there has been a virtual explosion in the beaver population in the upland areas of the southeast. This is due in part to successful reintroduction efforts, and because large tracts of former farmland are now in timber. While we will never be able to reconstruct exactly the habitats of



prehistory, the present situation provides a better comparison of past and present environments. Another issue concerns the longevity of a beaver colony and the associated pond(s). Barring human intervention, beaver ponds of prehistory could be expected to remain active for many years, perhaps even decades, owing to virtually unbroken ground cover and slow rates of sedimentation. By contrast, the activities of man in recent times - notably logging, agriculture, and construction - have accelerated erosion and deposition, and today a pond can complete its cycle in as little as ten years.

Any beaver pond is a feat of ecological engineering, and this is nowhere more true than in the narrow stream valleys of the Piedmont. As adult beavers travel overland to seek mates, they also seek new habitations. Having found a suitable unoccupied stream, they begin construction of the pond and the furnishings thereof.

During the early stages of pond building, the forest itself provides food and construction material. Large trees are killed by girdling, while smaller ones provide bark for food and sticks for building. As the pond begins to pool, a lodge is established by either digging into the bank or by building a conical stick and mud structure on an elevated platform (the archetypal "beaver lodge" of textbooks). Further flooding of the surrounding forest kills yet more trees, and the forest undergoes a massive rearrangement of biomass: trees give way to herbaceous wetland plants such as Cattail (*Typha latifolia*), Arrowhead (*Sagittaria latifolia*), Rush (*Juncus effusus*), Bulrush (*Scirpus* sp), Bur-Reed (*Sparganium americanum*), among others. These herbaceous plants are the beaver's preferred food, supplemented in winter months with the bark of willows (*Salix* sp) and other trees that are tolerant of flooded conditions. The relatively mild winters in the southeast make it unnecessary for beavers here to stockpile food. As wetland plants begin to proliferate in the sun-drenched marsh, beavers inadvertently spread some of their favorite food plants. By selecting a convenient perch on which to consume the roots of cattail or bur-reed, the beaver sloppily munches away, dropping bits of viable root into the water. These often take root, further perpetuating the food supply.

Yet in the narrow valleys of the Piedmont, it isn't entirely correct to call the impoundment created by a single beaver colony a "pond" in the singular sense of the word. As the height of the dam rises into the ever-widening valley, a dis-

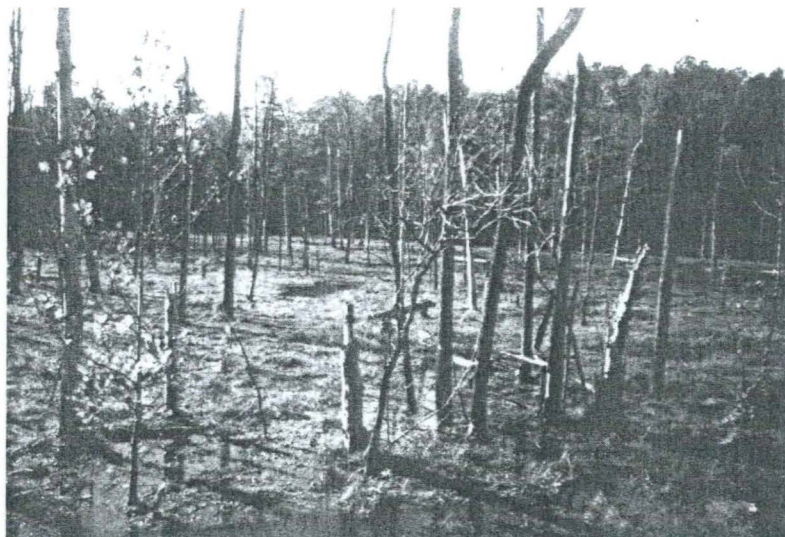
proportionately large amount of energy must be expended in order to facilitate a small rise in water level. Hence, a family (colony) of beavers constructs not a single pond behind a single massive dam, but a series of dams and ponds. This sequence of dams and ponds results in a linear structure similar to locks on a canal. It's not uncommon for a beaver "pond" to consist of a dozen or more dams built along a section of stream, each regularly maintained and repaired. All of this labor results in a single, continuous wetland that may stretch as much as a mile and a half. The lodge and main

area of habitation are typically in the middle, utilizing two or three large ponds; further up and down stream the dams and ponds decrease progressively in magnitude.

Given this linearity, it may be argued that no stretch of stream has been unaffected by the operations of beavers during the past. Also, it is not known if beavers re-occupy the same locations for the main pond areas, with a preference for certain landforms, topography, or stream configuration. From my observations, it ap-

pears that they will set up housekeeping along a certain stretch of waterway, and as it silts in they will gradually expand their operations up or down stream accordingly.

While beavers, being entirely vegetarian, are preoccupied with changes in the flora within their environment, the shift in the fauna from forest to wetland is worthy of more than passing note. Though the temperate forests of the eastern U.S. is a highly productive environment, it is enhanced by the addition of wetland areas. The open, sunny beaver pond provides a home to numerous kinds of waterfowl and wading birds that otherwise have no home in small, shaded woodland streams. It is a haven for reptiles and amphibians, with turtles being of particular culinary interest to humans. The varied aquatic habitats range from water several feet deep to weedy shallows, and are hospitable to many kinds of fish, from minnows to "eatin' size" species such as sunfish and bass. Mammals, too, benefit from the beaver pond. Aquatic mammals such as muskrat and otter are at home here, and the sunny waterway corridor provides increased edge habitat and succulent browse for deer.



**Mature beaver pond near Philomath, GA demonstrates the forest-clearing ability of the beaver.**

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## Beavers As Agents of Culture Change

So it was with these observations and questions in mind that I began to assemble my thinking about beavers, their habitats, and people. Archaeological surveys by myself and others (Freer, 1991; Pluckhahn, 1994; Chamblee, 1997; Jones, n.d.) have shown that the upland areas of the southern Piedmont were intensively occupied over the past 10,000 years. While the abundant lithic scatters left by Archaic hunter-gatherers are accepted as routine in upland areas of the hilly Piedmont, I pondered the fact that many of these same sites yielded pottery made by later agricultural peoples. What lured farming peoples of the past 2000 years into the uplands of the Southeast, to live along small - sometimes tiny - secondary and tertiary streams, especially when archaeological thinking about prehistoric agriculture continually stresses the importance of river floodplain agriculture? While changes within the culture receive credit for the presence of upland ceramic sites, the mechanisms that enabled these people to subsist on small terraces and ridge slopes has remained a matter of speculation. While the landscape modifications of beavers would have been beneficial to hunting/gathering/foraging peoples of the Archaic, I began to realize that these same habitats could provide part of the solution to the upland presence of prehistoric farming peoples.

The trail that led me to consider beavers and their works as more than a source for pre-cut sticks begins with a particular archaeological survey. In late 1992 I was the assistant field supervisor for a Soil Conservation Service workshop, and the exercise involved surveying a timber company clearcut near my home in northeastern Oglethorpe County. A multicomponent site (containing a range of stone tools and pottery) was located and collected on a prominent north-facing ridge nose on Macs Creek, a tributary of the Broad River. I recall that the view from the end of the cleared ridge into the forested stream bottom was aesthetically pleasing, but not necessarily a more promising subsistence prospect for either foragers or farmers than was the surrounding area. But a year or so later-with my interest in beaver ponds piqued by signs of beaver activity in the stream at my home - I revisited the site. The beaver colony that had previously dwelt in the area to the west of the site (on the other side of an unpaved county road) had expanded their territory eastward downstream so that the stream below 9OG500 now consisted of massive, cleared beaver pond and swamp, with all the associated flora and fauna. The dramatic change from hardwood forest to lush swamp sparked my interest, and my understanding of archaeological sites and their locations was forever altered.

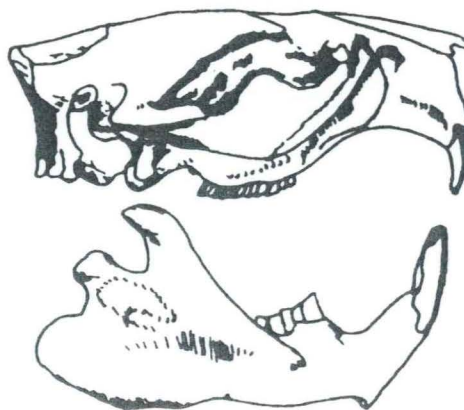
At about this time a pair of beavers moved into the small stream in front of my house. The intervening years have allowed me to observe intimately the early and mature stages of beaver pond development. During this time I became



*Beaver jaw gouge takes its place among bone and flint woodworking tools used to create wooden bowls.*

keenly aware of the magnitude of impact a beaver pond has on the local ecology. I watched as my tiny creek, once home only to minnows and a few crayfish, grew into a bountiful wetland. The growth of the pond was tempered, however, by the loss of many large trees, but the education was worthwhile. I became an ardent observer of beaver ponds, and I scouted many of the local ponds located in the timberlands surrounding my home.

As I assimilated into my thinking the significance of the wetlands created by beavers, I began to examine more closely the meadows that remain after the pond has filled with silt and organic matter and the beavers have abandoned their home. If the active beaver pond was a bonanza for prehistoric peoples, then the beaver meadow was an obvious solution to problems faced by early agriculturalists. Even if present in only small quantities scattered along tiny upland creeks, the small floodplains previously flooded, enriched, and finally abandoned by beavers were a ready source of pre-cleared farmland. By burning off the weeds, willows, and other sap-





lings that emerge after abandonment of the pond, the beaver meadow is practically ready to plant.

### Beavers in Archaeology and Prehistory

But do we - and *can* we - actually know the extent to which prehistoric peoples interacted with the environment of the beaver? The answer, unfortunately, is *no*. That beavers were common and widespread in North America at the time of European contact is well established. Ernest Thompson Seton (cited in Rue, 1964) estimated the beaver population in the U.S. at that time to be at least sixty million. The legendary fur trade virtually extirpated the beaver from much of its original range, although throughout the Southeast the trade in beaver pelts was overshadowed by the thriving commerce in deerskins (Hudson, 1976); nevertheless, by the mid-1800's the beaver had practically vanished. Successful reintroduction efforts in the early part of the twentieth century now provide us with a more realistic impression of past populations and their effect on the environment, to the point of becoming a nuisance to man-made ponds, culverts, farms, and timberland.

The archaeological record provides us with some clues concerning beavers and man in the Southeast. According to zooarchaeologist Elizabeth Reitz (personal communication) of the University of Georgia, beaver remains from archaeological sites in the southeast are almost nonexistent, on the order of about one specimen in a sample of two thousand. This would certainly argue for avoidance of beaver, or maybe a bias in the way they are represented. If, in the unlikely event that only the skins or the edible tail were taken, identifiable bones retrieved from the acid soils of the region would be rare.

Reitz adds another interesting observation, however. Whereas beaver remains are scarce, bones of muskrat (*Ondatra zibethicus*) are regarded as quite abundant in faunal assemblages. Although muskrats can (and often do) live independent from beavers, their population is greatest in beaver ponds (Baker and Carmichael, n.d.). In the small, shallow upland streams of the southeastern Piedmont, it may be fairly said that muskrats are practically dependent on beaver ponds for their habitat. This contrasts with the broad, meandering streams of the Coastal Plain, where the distribution and abundance of both beaver and muskrat are highly variable. It may be suggested that, in the Piedmont uplands, ancient Native Americans avoided beaver at the expense of the muskrat. Both

are quite tasty. The muskrat's smaller size and higher reproductive rate (4-5 litters per year consisting of 5-7 young per litter; Carmichael, n.d.) may contribute to its higher visibility in the archaeological record. Also, muskrats merely inhabit the pond created by beavers, and over-exploitation of muskrats only results in a shortage. Careless killing of beavers may result in the loss of one of the primary pair, and premature abandonment of the pond.

Linguistics may provide yet more clues. Native American legends vary in their depiction of the relationship between beavers and man, ranging from contempt to reverence, and this ambiguity is reflected in their languages. For instance, the word for beaver in languages of the Algonquian family are from the same root word, while names for beaver vary widely in languages of the Muskogean family, which were spoken throughout much of the Southeast. Again, the reasons for this inconsistency are unclear, and may simply represent the uniform distribution of beaver in the northern part of the continent where Algonquian languages were spoken, while the various words of Muskogean origin may attest to differences in distribution of beaver in the foothills and coastal plain of the lower South.

Although the use of the animal itself (in the form of pelts, tails, meat, and the handy incisor teeth) is historically documented among various native groups, we will never know the degree to which they exploited the environments created by these creatures. If people regarded the beaver as an industrious but subhuman kinsman, then we could expect them to be treated with deference, the active ponds as a resource,

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**Tools from the pond: top - beaver-cut white oak digging stick required only slight modification; bottom - pre-cut willow fire hearth.**



and people patiently waiting for a pond to be deserted before turning it into a cultivated field. On the other hand, if the beaver was viewed as a competitor for certain resources, then nothing would protect the beaver colony from being ousted or killed, the dam destroyed, and the meadow cultivated prematurely. Also, the patience with which one awaits the abandonment of a pond is tempered by the utility value of the active pond and the rate at which it fills in with sediment and organic material.

Whether or not to kill the goose (or in this case, beaver) that lays the proverbial golden egg may also depend upon the practices of the particular culture in question. Hunting and gathering peoples of the Archaic (ca. 10,000-3,000 BP) relied on the variety of wild resources within their territory. It is therefore likely that they viewed beavers and beaver ponds as resource areas for game and plants, perhaps occasionally harvesting beavers for food, pelts, or other purposes. Numerous lithic scatters in the uplands of the southeast attest to the presence of, if not preference for, this area, and beaver ponds would enrich the productive potential for ancient foragers.

As agriculture came to dominate native life in the eastern North America during Woodland and Mississippian times (ca. 3000 BP- AD 1540), river floodplains became the focus of increasingly structured social and political cultures. Beaver ponds along the secondary and tertiary upland streams may have been an asset to hunting forays into these otherwise heavily forested and relatively unpopulated areas. Yet at times during the Woodland and Mississippian, the uplands seem to experience peaks in population, represented by the presence of certain ceramic types. This is especially true for the middle/late Woodland (late Swift Creek and Vinings phase) and late Mississippian (Lamar) periods. Whether these upland immigrations are the result of population pressure, social/political breakdown, or other factors, the remains of these agricultural peoples are frequent constituents of upland sites. Although beavers served to clear and enrich the land, early farming peoples may have viewed them as competitors for the scarce floodplains of narrow upland stream valleys. Co-

existence of Mississippian farmers with beavers may not have been tenable, at least not in close proximity. Sources (South Carolina Department of Natural Resources, n.d.; Baker and Carmichael, n.d., and personal communication with several farmers) indicate that beavers (and muskrats) are destructive to corn and other crops.

Despite the potential problems of maize cultivation in the presence of beavers, ancient Native Americans, lacking domestic livestock, nonetheless would have found beaver ponds to be an invaluable source of game. Upland areas are greatly enriched from their presence, and in a region wherein major

ivers and associated backswamps are separated by many miles, the presence of beaver ponds on lesser streams creates a wonderfully diverse mosaic of alternating uplands and wetlands. The abundance of muskrat remains - particularly in the Piedmont region, where naturally occurring aquatic habitat is scarce - indicates that beaver habitats were exploited, if not encouraged.

The linearity of beaver ponds in upland areas of the

Southeast may hold the key for interpretation of late prehistoric farmsteads. One possibility is that silted-in sections of beaver meadow were cultivated as the beavers moved up or down stream to new areas. Alternatively, beavers may have been discouraged from a particular section by killing them or excluding them from fields with a fence or palisade. A family or kinship unit of upland Mississippian farmers could dismantle daily a beaver's work from the previous night, and stockpile the sticks to dry for future use as firewood.

As an additional note, soil fertility in the resulting meadows is variable. In areas with acidic, oxygen-poor water (e.g., coniferous forests), the decay of accumulated organic matter may be inhibited, creating a soil deficient in nutrients. Under other conditions, however, a pond rich in oxygen will, in time, become a rich meadow.

In summary, we may only speculate about the extent to which early peoples used the habitats and resources created by the beaver. Unlike its cousin the Eurasian beaver (*Castor fiber*), now restricted to a fraction of its original range (Whitfield, 1984), we may find our observations of the North



*Beaver-cut timbers alongside axe-cut members around smoke hole of Earthlodge 2.*



American species constructive for interpreting prehistory. With modern beaver populations comparable to those of the past, it is possible to interpret by way of analogy.

### Using Beaver Ponds and Beavers

If you have a beaver pond nearby, you can experiment with some of the ideas and observations outlined above. Before digging into the beaver dam to retrieve sticks or other goodies, make sure you're not violating any wetland protection laws. Beavers are often considered a nuisance, but an established pond may be on the books as protected wetlands. Beavers are persistent, and you're unlikely to run them out of their pond. You can raid the dam, pond, or lodge for material for tools, construction, or firewood. Just make certain you remove any wood you want to use well away from the pond. If you don't, the beavers will reclaim it at night, reinstalling it to suit their needs. And you need not feel guilty about absconding with the fruits of their labor - they will dutifully replace the sticks you remove, and repair any damage you've done. Just remember, though: the more you take, the more they must cut. If there are trees in the immediate vicinity you don't want them to cut, don't be greedy.

You may find your local beaver pond a valuable source of edibles, too. Fish and turtles are possibilities, as are plants. A variety of berries and fruits (notably Elderberry, *Sambucus canadensis*) may be found along the pond margins, and Cat-tails and Arrowhead are often found growing in shallow water.

But before you grub out a fat Cattail root and start munching, be aware of a couple of hazards that the beaver and its pond can pose. Along with other aquatic mammals, beavers often eliminate their feces into the water. As a consequence, water from a beaver pond and anywhere else downstream - even sparkling clear water - can be contaminated with *Giardia*, a protozoan that inflicts a distressing, long-lasting kind of dysentery. Also, beavers can carry tularemia ("rabbit fever"), a bacterial disease which is passed on to humans through handling or butchering. Whatever you take out of the swamp, cook it first! And, depending on where in the country you are, there may be other risks. The Snapping Turtle (*Chelydra serpentina*), a large aquatic turtle that can inflict a nasty bite with a tenacious grip, is found throughout much of eastern North America. Parts of the south are home to the Water Moccasin (or Cottonmouth, *Agkistrodon piscivorus*), a semi-aquatic pit viper. So whether in the water or out, watch where you step!

Given that a beaver colony consists of the primary mated pair, the current year's young (usually at least two), and often the previous year's young, there are frequently a few expendable individuals. It is beyond the scope of this article to describe beaver trapping, and a little consultation with a knowledgeable trapper is worthwhile before attempting it on your own. The beaver is a fine source of meat, however, and the fur is legendary. The tail contains much fat, and when fried it has a bacon-like quality. The bright orange incisor teeth that serve the beaver in life are useful to the primitive technologist as well. One of the mandible (lower jaw) halves may be

used as a handle with the incisor left in place. Beaver tooth knives are possibly the original version of the "crooked knife" used for hollowing wooden items like spoons and bowls. When dull, the incisors may be honed to a keen edge by using a smooth stone.

And while you're mucking around in your neighborhood beaver pond inhabited by rodents weighing between 40 and 60 pounds, take a good look at the size of the trees they're willing to tackle. Then cast your thoughts back to the Ice Age giant *Castoroides*. Consider what these 400-pound Ice Age beavers were capable of doing!

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