Northern Tsimshian Elderberry Use in the Late Pre-contact to Post-contact Era

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Abstract. The use of plant resources in two Northern Tsimshian habitation sites—Ginakangeek (GbTh–2) and Psacelay (GbTh–4)—can be mapped from recovered floral seed remains of three berries, most notably red elderberries (*Sambucus racemosa*). Seed remains recovered from occupational surfaces and midden deposits represent both the spatial distribution of plant-related activities and the relative frequency of plant use through the contact era, from the late 18th century to the early 20th century. We argue that these data demonstrate a correspondence between the spatial and social organization of Northern Tsimshian households and present evidence of the changing role of subsistence economics of the extended family network through contact with Europeans and the rise of a market economy.

Résumé. Les graines de trois baies, plus particulièrement celles du sureau rouge (*Sambucus racemosa*), récupérées sur deux sites d'habitation—Ginakangeek (GbTh–2) et Psacelay (GbTh–4)—permettent d'étudier l'utilisation de ressources végétales chez les Tsimshian du Nord. Les graines récupérées des surfaces d'occupation ainsi que des dépotoirs représentent à la fois la répartition spatiale des activités reliées aux traitements plantes et la fréquence relative de l'utilisation de ces plantes pendant la période de contact entre la fin du XVIIIe siècle et le début du XXe siècle. Nous soutenons que ces données démontrent une correspondance entre l'organisation spatiale et l'organisation sociale des habitations des Tsimshian du Nord. Ces données sont également la preuve de changements dans l'économie de subsistance du réseau familial étendu dus au contact avec les Européens, changements qui mènent éventuellement à l'apparition d'une économie de marché.

It is becoming increasingly clear that plant resources were significant contributors to indigenous subsistence on the Northwest Coast of North America, and that, where preserved, they are recoverable using standard excavation methods (Lepofsky *et al.* 2001; Lepofsky and Lyons 2003; Losey *et al.* 2003). In this paper we present the results of an analysis of macroscopic plant remains from two Northern Tsimshian habitation sites, the occupation of which spanned the contact encounter with Europeans. We have identified five plant species, although the majority of the remains are red elderberry (*Sambucus racemosa*). Plant remains were recovered from 61 seed lens contexts within middens and habitation floor features and represent almost half a kilogram of seeds. Our analysis hypothesizes that: 1) the Northern Tsimshian used a multi-staged processing method to convert berries into storable foods; 2) that the spatial organization or syntax of this processing mirrors social

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organization and reflects differential access to economic resources within the extended family household; and 3) that the collection, consumption, processing, and storage of elderberry resources were significant and consistent economic activities prior to contact that intensified during the first decades of the contact era before declining dramatically by the mid-19th century. A modest rebound in elderberry remains was noted for the late 19th century before all evidence of elderberry use disappeared.

We hypothesize that economic organization of elderberry resources corresponded to social organization within Tsimshian communities and was manifest in the spatial patterning of plant remains and related features at archaeological sites. This is consistent with Tsimshian ethnographic evidence and with materialist assumptions in hunter-gatherer archaeology in general (Martindale 1999). The use of elderberries is visible in the distribution of floral remains and plant-related features in the architecture of a late pre-contact to early contact era habitation site known as Psacelay, GbTh–4 (Figure 1). The architecture of Psacelay corresponded to the social organization of the Tsimshian extended family household, and Martindale (1999; 2004a) has argued that the site represents the habitation of two related lineages living in separate dwellings and composed of 4–6 constituent nuclear family subunits. The distribution of seed remains and processing features suggests that while the entire extended family participated in the collection and processing of plant resources, they were generally divided by

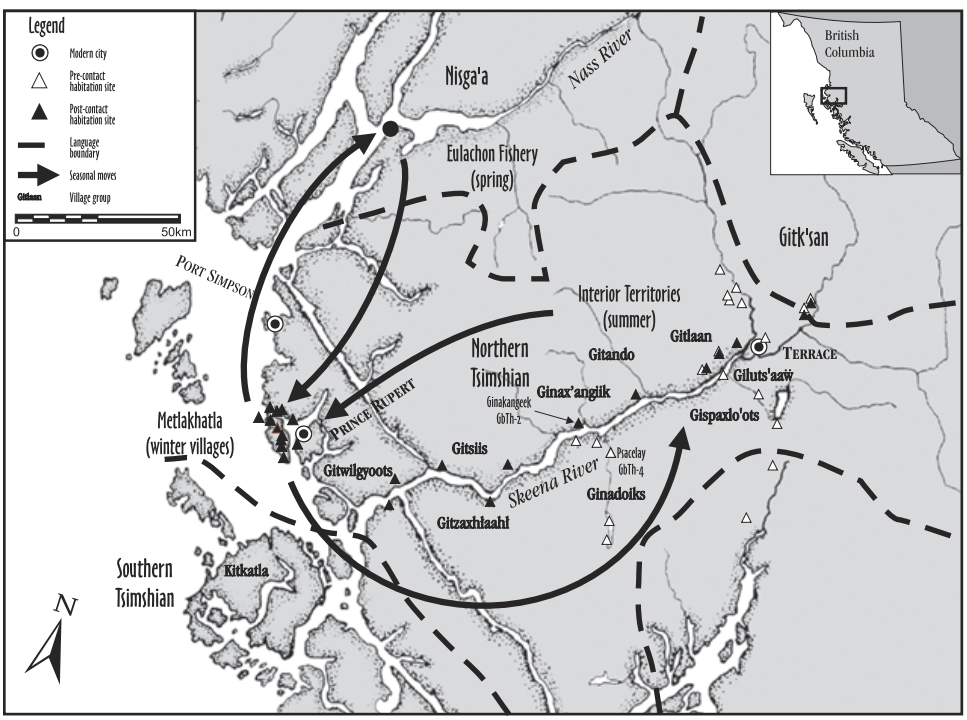

FIGURE 1. Northern Tsimshian territory.

nuclear family for consumption. In addition, surplus plant foods were processed for storage by the extended family, but stored in the house within the private area of the families at the rear on the building, the areas ethnographically associated with lineage leaders. This suggests that the social hierarchy reported of traditional Tsimshian households was related to economic control of surplus subsistence resources. In general terms, the Northern Tsimshian enjoyed a surplus economy in which food production exceeded food consumption such that excess food resources could be used for trade, ceremonial activities, or to fund part-time occupational specialists. Since the resources were seasonal, it was also a delayed-return economy in which food supplies were collected in quantity as they became available then processed and stored. While we do not disagree that the foundation of the delayed return and surplus economic capacity was build around anadromous fish, our data suggest that plant foods were also significant food resources.

Our second thesis is that the changes of the post-contact era affected the use of plants in Tsimshian communities. The occupation of Psacelay overlaps with the occupation of the nearby village site of Ginakangeek (GbTh–2), which was occupied from the early contact era to the mid-20th century (Figure 1, Table 1). Ginakangeek has multiple occupational components that contained changing architectural, material, and economic data through the contact era to the mid-20th century. We argue that elderberry production increased dramatically in the early contact era (i.e., after AD 1787) and then declined precipitously through the 19th century. In the late 19th century, plant food use rebounded somewhat before disappearing from the archaeological record during the 20th century. Aspects of this changing pattern of plant remains may be explicable as a decline in traditional subsistence activities during the colonial era as Tsimshian people turned to market-oriented activities and trade for food. However, the increase in elderberry remains after contact and their rebound in the late 19th century are more difficult to interpret. Such a pattern is consistent with complex post-contact economic trends identified by Martindale (2003, 2004a), which included a continuation of the indigenous subsistence economy through the early years of the contact era followed by a shift to a market economy in the latter half of the 19th century. Evidence of a return to local plant foods in the late 19th century coincides with increases in the use of other pre-contact materials and may be interpretable as a return to traditional cultural practices at a time of increasing tension between Tsimshian and European peoples.

NORTHERN TSIMSHIAN SUBSISTENCE ECONOMICS AND BERRY USE

The nature and structure of the traditional Tsimshian subsistence economies of the Northwest Coast are well known from ethnographic data, but it is unclear how comparable ethnographic observations are to archaeological time frames. Although use of the term "Tsimshian" to describe communities sharing cultural similarities in antiquity has complications[1], Martindale and Marsden (2003) have established that ten Northern Tsimshian[2] village groups formed a regional political and defensive alliance after 1500 BP (Figure 1). The shared economic traits of these communities were not an anthropological construct nor a

Table 1. Floral remains at Psacelay and Ginakangeek.

Occupational Component	Estimated Age (AD)	Volume Excavated	Type (No.) Seed Lenses	Total Seed Weight (g)	Estimated Fruit Weight* (kg)	Seed Density (g/m³)
***Ginakangeek*:**						
South Layer A, C, North Layer A	1920–1952	10 m³	Choke Cherry (7)** Beaked Hazelnut (2)**	0	0	0
South Layer D, North Layer C	1875–1920	10 m³	Red Elderberry (6)	6.59	2.64–6.59	0.66
South E, North Layer D	1850–1875	10 m³	Red Elderberry (3)	0.88	0.35–0.88	0.09
South Layer F, North Layer E/G	1800–1850	10 m³	Red Elderberry (5) Salmonberry (1) Blueberry	11.69 0.01 ***	4.68–11.69 <0.01	1.12 – –
Psacelay:						
House 1	1780–1810	4.75 m³	Red Elderberry (23) Salmonberry (10)	372.01 3.67	148.80–372.01 0.26–0.52	82.66 1.29
House 2	1750–1780	10 m³	Red Elderberry (34) Salmonberry (4)	88.6 0.48	35.44–88.60 0.034–0.067	8.86 0.05

* Fruit weight is calculated by converting the seed weight to an estimate of the number of seeds, dividing this by the average number of seeds per fruit, and multiplying the result by the average weight per fruit.
** Individual seeds.
*** 1 desiccated whole fruit.

product of post-contact political dynamics but a function of cultural proximity and shared economic interrelations borne of a common history.

The Northern Tsimshian were hunter-fisher-gatherers who exploited a wide range of foodstuffs from diverse ecozones within their territory[3]. The two main constellations of resources were marine and terrestrial, and the Northern Tsimshian settlement pattern after 1500 BP was structured such that people traveled between coastal (winter and spring) and interior valley (summer and fall) territories to coincide with the appearance of seasonally available resources (Figure 1) (Martindale 1999: 104–108; 2003). It is thought that the Northern Tsimshian economy was dominated by anadromous fish, most importantly salmon and eulachon[4]. Both represented significant subsistence resources due to their storability and productivity. An extended family of 30 or so people could produce a year's supply of eulachon and salmon in two or three months if collected during seasons of peak availability where the limiting factor was processing labour (Martindale 2004a). Production beyond these levels represented the surplus wealth of the Northern Tsimshian

(Coupland *et al.* 2001; Drucker 1965; Martindale 2003), which was relatively easy to achieve during years of normal fish availability.

The remainder of the annual subsistence cycle was devoted to the collection of what has been thought of, perhaps incorrectly, as secondary resources—such as plant foods. Berries are frequently interpreted as a food luxury or a flavoring and were eaten fresh, preserved as dried cakes or soaked in eulachon grease and served as a second course at meals (Boas 1916: 406). However, our data suggest that they were produced in sufficient quantity to be considered a food staple. Even when fish and game were plentiful, berries would have provided necessary nutritional breadth. Some fruits, such as crabapples and cranberries, were stored especially for winter ceremonial feasts (Garfield 1939: 199). The Tsimshian used a variety of fruits although our results are primarily elderberry seeds.

Elderberries are not often mentioned as a food source, although they represent the most abundant floral element in our samples. Red elderberries were an important symbolic plant among all Tsimshian peoples. Contrary to the widely held view that these fruits are toxic (Losey *et al.* 2003: 695–696), they were routinely eaten by people throughout the coast (Turner 1995: 67). Although not highly regarded by all First Nations (see for example Gottesfeld's [1994]) discussion of plant use among the neighbouring Wet'suwet'en), red elderberries had a suite of symbolic meanings for the Tsimshian. For example, the first eulachon caught each spring was roasted on a frame of elderberry sticks (Boas 1916: 450; Miller 1997: 171) in a ritual practice that appears to have celebrated the value of the resource. In addition, Tsimshian myths associate the red elderberry seed with human mortality, and may have used them in burial rituals. In stories reported by Boas (1916: 62; 663–663), the mythical beings of Stone and Elderberry quarrelled in the beginning of time over who should give birth first: Elderberry won the argument and, as a result, people live short lives and elderberries grow on their graves. According to Cybulski's (1992: 73–74) data from the Nisga'a burial site of Greenville on the Nass River, Tsimshian people may have packed burial boxes with elderberries or their seeds as part of the internment ritual. Of the 57 individuals at Greenville, 16 were associated with elderberry seeds. However, 40 of the total burials were disturbed or decayed to some degree (Cybulski 1992: 191–203). Of the 17 intact or partly intact burials at Greenville, 11 were interred with elderberry seeds.

Many ethnographic sources identify plant resource zones as economically significant food sources owned by women (Boas 1916: 52; Garfield 1939: 199; 1951: 15; Turner 1995: 11), or plant collection and processing as a task predominantly performed by women in territories owned by their household groups (Garfield 1951: 17; Halpin and Seguin 1990: 270; Miller 1997: 22). Ethnographic sources and oral traditions refer to the practice of women giving the first berry picked in each year to the sister of her husband or father who reciprocated with gifts (Halpin and Seguin 1990: 270; Miller 1997: 22). Since women who owned berry-grounds would most likely have sisters-in-law and daughters-in-law, the economically one-sided exchange would have been balanced as women acted as both givers and receivers of the first berry. This suggests that the ritual was as much about maintaining affinal relationships and celebrating the economic value of berries as it was about redistributing gifts.

ARCHAEOLOGICAL CONTEXT

Psacelay (GbTh–4) and Ginakangeek (GbTh–2) are two Northern Tsimshian archaeological sites whose occupation spanned the contact era, which began in AD 1787. They have been described in detail elsewhere (Martindale 1998; 1999; 2003; 2004a), but the results can be summarized here. Both are habitation sites from the interior of Tsimshian territory, along tributaries of the Skeena River. Psacelay (GbTh–4) is in the Gitnadoix valley, territory of the Gitnadoix Tribe[5], while Ginakangeek is located on the Exchamsiks River within Ginax'angiik territory (Figure 1). Psacelay is primarily a late pre-contact habitation site composed of two traditional-style plank houses (Figure 2). Ginakangeek (Figure 3) was a larger village occupied from the late pre-contact era through to the mid 20th century.

Much of Psacelay's archaeological data is analogous to that of the ethnographic record. The site was occupied in the summer to fall seasons; its occupants moved to a coastal village during the winter and spring. Artifacts and features reveal a technology focused on tools shaped from grinding stone and other materials, such as bone and wood. Occupation of the site began in the mid-18th century, and it was abandoned in two stages in the very early contact era. House 2 was abandoned first, around AD 1800. Its main support posts were removed and the resulting pits used as middens by the occupants of House 1. The upper stratum of House 1 contained the only European artifacts found at the site, a glass bead and a small sherd of blue and white crockery. The architectural remains are typical of Tsimshian house design. Both structures were large—11.8 x 14.3 m (House 2) and 11.8 x 18.8 m (House 1)—with post patterns that match Tsimshian post-and beam construction recorded by Boas (1916: 46–47). Each was constructed around a central 4-post frame that stood within the house walls and held the roof. Smaller posts at the building corners and at mid-points of the walls anchored internal spatial divisions that created five sub-units around the central space of the building; the units at the back of the house were associated with the highest ranked families of the lineage (Martindale 1999: 297–300). The central area was dominated by a large hearth, and repeating architectural elements within each sub-unit indicate that these were the constituent co-resident units (probably families) that comprised the household (probably an extended family lineage). The architectural data demonstrate that the co-resident winter village group split into its constituent extended family households during the summer months in the interior territories, a pattern that reflects the economic significance of the interior zone (Martindale 1999; 2004a).

Ginakangeek is located on the Exchamsiks River within Ginax'angiik territory (Figure 1). The site has as many as ten separate occupational components, although these are known from two separate zones within the site, referred to as the North and South Areas (Figure 3). Stratigraphic and material similarities and differences cluster these components into five occupational phases, which are summarized in Table 1. The occupational sequence at Ginakangeek is complex, but artifact distributions and architectural features suggest that the lowest layers in the northern area predate the south, and that the upper layers on the north are contemporaneous with the lower layers in the south.

The stratigraphic sequence includes a series of four sequential villages and vil-

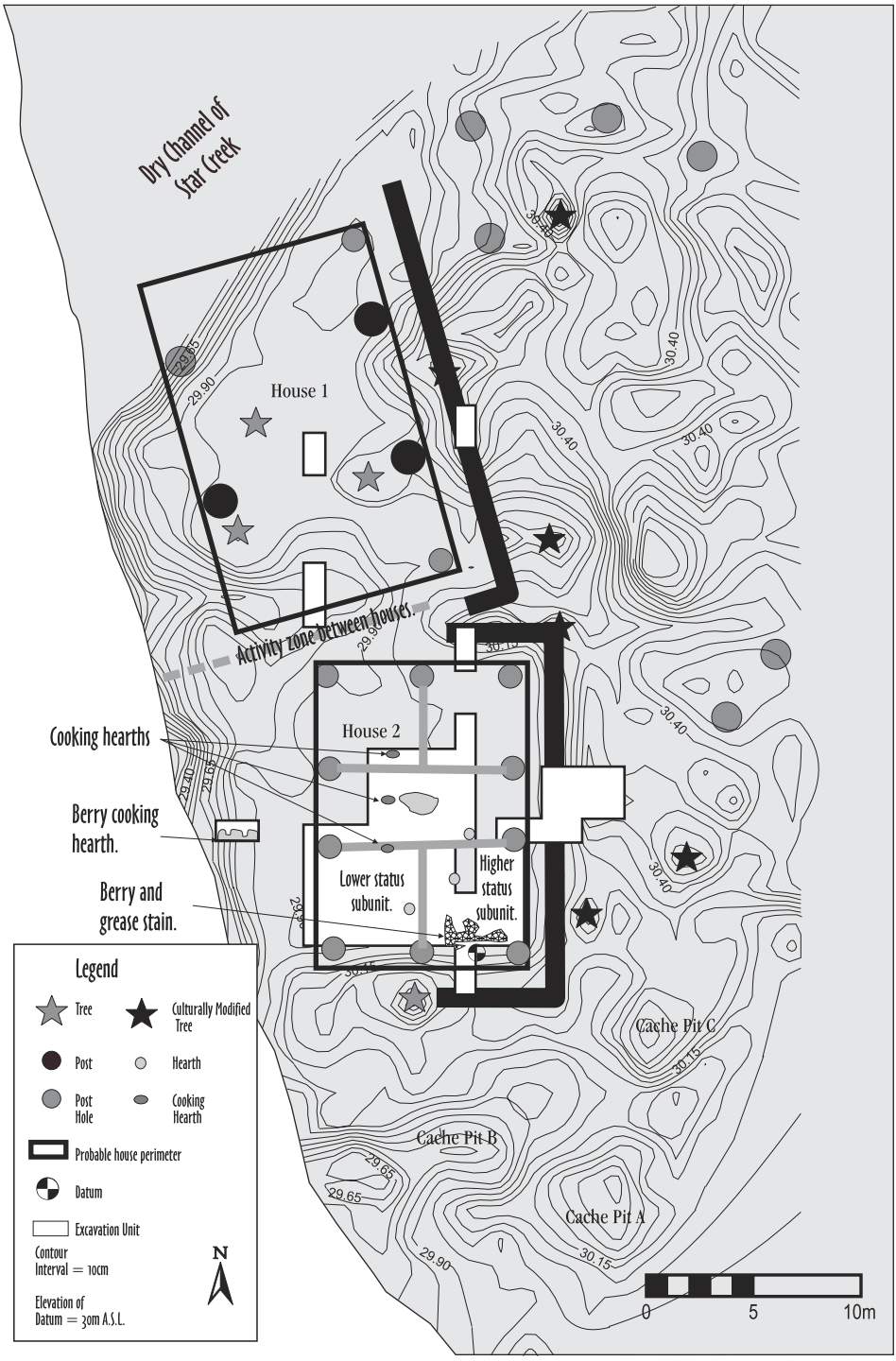

Figure 2. Psacelay.

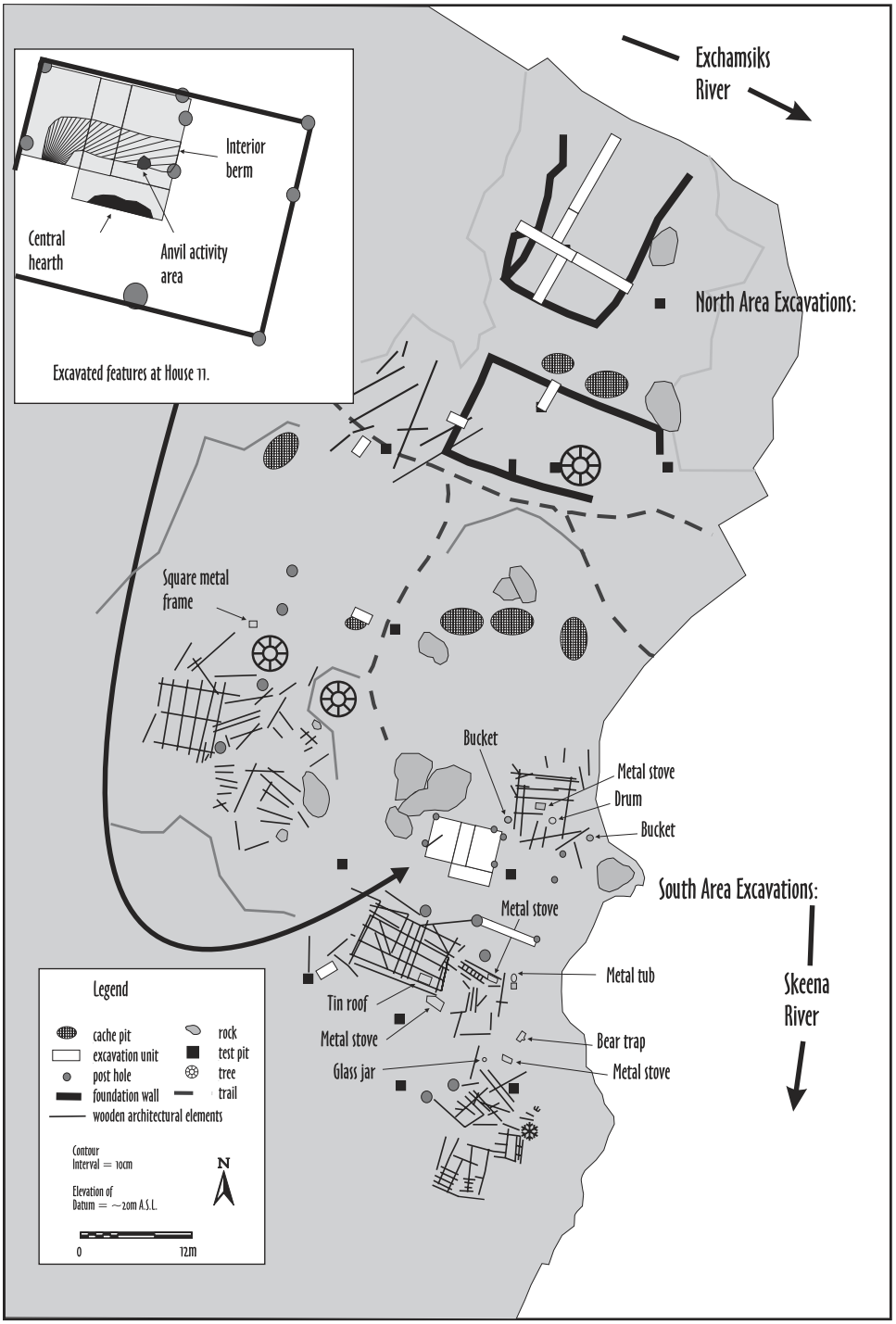

FIGURE 3. Ginakangeek.

lage reconstructions. The earliest levels in the north (North Area layers E, F, G) date from the early 19th century and contain house floors and associated internal and external features of at least two structures which share many characteristics of those found at Psacelay, and descriptions from ethnographic sources. This phase represents a summer-occupied hamlet of probably no more than 2–4 houses representing divisions of an extended family lineage analogous to Psacelay. To the south, the lowest levels are known from a series of hearth and features associated with ground stone tools, but containing a small quantity of European objects, mostly metals. This area was probably used as a small fishing station while the houses of the North Area were occupied.

The next major occupation, dating from about AD 1850 to 1875, involved the abandonment of the North Area houses and the construction of post-and-beam houses in the south. Here (South layer E) were a series of floor surfaces and middens with contents (ash, sand, charcoal, artifacts) suggesting household debris similar to the ridge middens found at Psacelay (Martindale 1999: 155). Based on the ratio of European to indigenous artifacts, these components can be associated with the debris field (North layer D) above the north-end buildings.

Above this component, the southern area of the village included two layers associated with a period of village reconstruction dating to the latter decades of the 19th century. Layer D in the South Area included winterized post-and-beam houses and a high proportion of European to indigenous material remains. The post-and-beam buildings of this phase differ from those in the north. They were constructed around a central excavated depression and oriented with their long axis perpendicular to the river, similar to houses found on the coast, and different from the pre-contact interior pattern of flat floors and long axes parallel to the river. These traits, along with a massive central coal hearth suggest that these buildings were occupied throughout the year. Layer C in the northern area included a high proportion of European items and a series of with earth-and-stone foundation walls that appear to be European buildings, associated with the construction of the nearby rail line between 1908 and 1913. These features most likely coincide with the latest period of occupation of the post-and beam buildings in the south.

Although the site has been in frequent use by recreational campers and fishers over the past century, the final phase of occupation occurs only in the south end, where the remains of three A-frame European style houses still stand (South layer C, A). These buildings were constructed in the 1920s and were occupied until 1952. Much of the surface debris at the site dates from this occupation and includes a substantial quantity of early 20th-century objects, such as wood stoves, window glass, and doors.

Throughout the excavations of these two sites we encountered dense concentrations of berry seeds in visible seed lenses. This paper is an analysis of these lenses, their distribution in the context of household architecture, and the changing stratigraphic components through the post-contact era. Although our sampling strategy for plant remains was not random, berry seed lenses appeared frequently and in such large quantities that we hypothesized that the distribution of seed remains would a) illustrate the operational and social organization of berry food production and b) track changes in berry food use, and perhaps echo changes in traditional

economic activity, through the post-contact era.

Seed Recovery Methods

Excavations were conducted using a "household archaeology" approach, which argues that the social unit of an extended family household is the fundamental social, economic, organizing, and reproducing principle in small-scale societies (Ames 1996; Coupland and Banning 1996; Martindale 2004a; Wilk and Rathje 1982). Methodologically, the focus of research was the spatial and material correlates of households, which in the Northern Tsimshian were large, post-and-beam plank houses. The excavation strategy identified house architecture within occupational components and exposed large interior floor areas. The excavation approach was holistic: plant elements were identified as seed lenses both within house features and as components of external middens.

Seed lenses were densely packed zones of high seed concentration identified *in situ* during excavation. Floor and midden contexts at these sites are primarily hard packed sandy loam with low organic content. Against this background, household features and stains, including seed lenses, were clearly visible. Excavation was conducted by trowel and each visible seed lens was removed in its entirety.

Pearsall (1989: 16) notes that *in situ* collection produces biased results as it restricts data to only that which is visible without magnification and only in concentrations sufficiently large to be identified as distinct features. Although this sampling strategy favours macroscopically identifiable seeds in large clustered lenses, it is a representation of the presence of seeds at these sites. Further research may show that other seeds and plant remains are recoverable in other forms and contexts at Northern Tsimshian sites through flotation of hearth contents, for example. Thus, our results are skewed towards certain disposal patterns and hence, specific species of plants, although the relative changes in our data should accurately reflect changes in use of those species.

Two types of seeds were identified at Psacelay: red elderberry (*Sambucus racemosa*) and salmonberry (*Rubus spectabilis*)[6]. Five species were identified at Ginakangeek: red elderberry, salmonberry, choke cherry (*Prunus virginiana*), beaked hazelnut (*Corylus cornuta*), and blueberry (*Vaccinium ssp.*). Species identification was based on comparison to a prepared collection of separated and dried seeds from the lower Skeena Valley.[7] Elderberry formed the majority of our results, and many of the seeds in our samples were broken and pitted, suggesting grinding; no estimate of the proportion of whole seeds was made, except to note that less than half of the seeds were pitted. Shape, size, and seed coat texture were sufficiently diagnostic to permit species identification of even small fragments (Pearsall 1989: 144). Seeds were not charred, although their location as discrete zones in floor and midden contexts indicates that they were culturally deposited, rather than the product of natural seed dispersal or animal activity. Elderberries are not found at either site today.

Red elderberries were the most common seed remain recovered; salmonberry occurred infrequently, and only trace levels of blueberries, choke cherries, and hazelnuts were identified. Red elderberries are a widely distributed, fast-growing shrub 1–6 m tall and found throughout the coastal valleys of the Pacific Northwest. Their fruit are small (2–4 mm diameter) and grow in

dome-shaped clusters that ripen in late summer, during July and August (Hitchcock *et al.* 1959: 262–263; Turner 1995: 67–68). Red elderberries have between 2–5 seeds per berry (Conrad and McDonough 1972; Pojar and Mackinnon 1994: 70). Salmonberries are similarly distributed shrub, up to 4 m tall, occurring in wet soil throughout the coastal forests and meadows. The fruit is multilobed (10–20 mm in diameter) and resembles raspberries growing in small clusters of approximately 30 per plant (Hitchcock *et al.* 1959: 262; Losey *et al.* 2003: 696; USDA 2004). Salmonberries are noted as having high seed content, estimated at between 50–100 seeds per fruit (Binggeli and Paterson 1999; Tappeiner and Zasada 1993). Berry weight for elderberries was estimated at 1 g, and at 3.5 g for salmonberries[8].

All seed lenses were collected in bulk and stored in cloth bags until dry. They were then screened through 6-, 4-, 2- and 1-mm-mesh to separate the sample into fractions. The seeds were collected in the various screens, although most were in or passed through the 1-mm-mesh. All fractions were then sorted by hand with the aid of a binocular microscope to isolate the seed remains and separate them into species. The sandy matrix of the lenses permitted manual separation of seeds and minerals. While lenses contained small amounts of other floral elements, our current research focused exclusively on seeds. Due to the large quantity, ten samples (all from Psacelay, House 2) were split into fractions using a sample-splitter, and totals were estimated from fractions of between ¼ and 1/32 total volumes. In all other cases, 100% of samples sorted into different seed types, each of which was weighed.

Seed quantities were estimated by weight and not count because of the high number of individual seeds. The weight of a single red elderberry or salmonberry seed from our samples was estimated to be ~0.0005g[9]. Thus the entire sample of 479.77 g of seeds represents an estimated 959,540 individual seeds (479.77 g/0.0005 g). Seed weight is a reasonable proxy for seed counts, although it assumes that all seeds are complete and underestimates seed numbers. Thus, our estimates of seed and fruit quantity (below) are conservative, although they should be accurate relative measures of differences between and within sites.

Results

Measures of seed lens weight were used to estimate fruit weight. As noted above, the weight of a single dried red elderberry seed was estimated to be ~0.0005 g and the weight of an elderberry containing 2–5 seeds ~1 g. The entire sample of elderberry seeds represents an estimated 190–475 kg of fruit. Salmonberry seeds have approximately the same mass, although their fruits weigh ~3.5 g and contain between 50–100 seeds per fruit, thus the sample of 4.01 g of salmonberry seeds represents approximately 8,020 seeds or 80–160 berries, equaling about 0.28–0.56 kg of fruit. Although this calculation mixes results from different sites and occupational components, it serves to indicate that red elderberries were a common plant food resource exploited at these sites, and that they were used in sufficient quantity to be regarded as a notable food source, perhaps even a food staple.

Seed lenses were recovered from different strata at the two sites. Forty-two m^2 of excavation units were completed at Ginakangeek, with the same volume of material (10 m^3) removed from each of the four occupational components. Each component also included major architec-

tural features such as middens, hearths, and housefloors. A larger area was excavated at Psacelay (10 m^2), although the depth of cultural deposit was less than that seen at Ginakangeek, resulting in excavated volumes of 10 m^3 (House 2) and 4.75 m^3 (House 1). Table 1 lists the total seed lenses, seed weights, and calculated fruit weight estimates by occupational component. *In situ* collection was unsystematic, and estimates of seeds per sample volume reveal only the density of seeds within lenses. A systematic sampling strategy of uniform volumes of soil samples from occupational surfaces and features for flotation is a standard means of producing quantifiable results (Pearsall 1989: 95). However, if we assume that seed lenses appear in occupational components as a reflection of fruit use, then seed weight per excavated volume (Table 1) provides a relative measure of fruit use that is comparable to the more standard seeds/liter of systematic sampling[10]. The calculation of seed density in this manner provides both an absolute estimate of seed density and a relative measure of changes in seed density over time. Because of the unsystematic sampling, we have less confidence in the absolute estimates of plant use, and remain cautious about concluding that berries were used in quantities comparable to other food resources. However, the consistent appearance of seed lenses throughout the occupational components of these sites suggests that they represent a measure of the relative use of elderberries. Thus, we have more confidence in our analysis of the distribution of elderberry seeds in space and through time. Comparability increases if the occupational contexts from which the seed lenses were collected were similar in different sites and layers. In all cases, seeds lenses were located during the excavation of house floors and associated ridge middens, with one exception. The occupation of House 1 at Psacelay included pit middens made from removed houseposts of House 2. These pit middens contained high concentrations of seeds and may represent a different kind of depositional activity, a factor we consider in the discussion of seed remains at Psacelay, below.

The high representation of elderberries over other fruit seeds may be due to a number of factors including the relatively large size of elderberry seeds, the high seed-to-fruit ratio of elderberries, and seed toxicity, which resulted in greater seed volumes per unit of fruit weight and higher rates of seed removal prior to consumption than other fruits. The toxicity of elderberry seeds and their large size relative to the berries may result in an overrepresentation of this species' seeds in archaeological contexts. This may explain why these data contrast with ethnographic evidence that indicates that red elderberries were used only moderately by coastal peoples (Turner and Davis 1993: 186).

Seed Remains and Features at Psacelay and Ginakangeek

Evidence of the spatial organization of berry processing at Psacelay emerges in the location of floral data and related plant-processing and storage features in the context of the architectural system of House 2 (Table 2). The distribution of seeds and related features appears to correspond with specific steps of the plant processing system. Initial processing of plants and cooking occurred outside the house, subsequent processing and cooking occurred in the common area at the centre of the house, cooking and consumption occurred within the perimeter subunits, and storage of processed plant

Table 2. Distribution of floral remains at Psacelay, House 2.

Occupation Area	No. of Seed Lenses	Seed Mass (g)	Estimated Fruit Weight (kg)
House 1:			
Exterior Ridge Midden	Red Elderberry (16) Salmonberry (9)	78.11 3.51	31.24–78.1 0.25–0.49
Reuse of House 2 post hole as pits	Red Elderberry (7) Salmonberry (1)	293.09 0.16	117.2–293.1 0.01–0.02
House 2:			
Exterior Side Activity Area/ Midden	Red Elderberry (22)	78.12	31.24–78.1
Exterior Ridge Midden	Red Elderberry (10) Salmonberry (2)	6.85 0.05	2.7–6.9 <0.01
Interior Central Subunits	Red Elderberry (12) Salmonberry (2)	3.63 0.43	1.45–3.63 0.03–0.06

resources was associated only with the subunits at the rear of the house.

The yard area in front of the building was a flat, open area that appears to have been used for a variety of activities including initial processing of berries in a drying/roasting hearth. The hearth feature was ovoid with two indentations along one side, which we interpret as locations where the trestle posts would have stood. That the hearth was re-used, perhaps annually, is evident by its multiple small strata, each of which contained shallow post features indicating that the trestle was a table and not anchored into to ground. While the feature matches the pattern of a berry-cooking hearth (see below), no seed lenses were found within it.

Floral data were recovered in two zones within House 2: the common central space and the rear subunits (Figure 4). Small seed lenses were associated with both the main central hearth and one of the three nearby cooking hearths. If the external feature represents an initial stage of cooking, these lenses suggest a secondary stage of cooking of fruit mashes, perhaps involving some seed removal. A substantial purple stain feature in the rear corner subunit of House 2 appears to be a floor stain associated with berry juice (Figure 4). The stain formed a hard lens, the margins of which appear to coincide with both an exterior and an internal wall. Although no seeds were associated with this feature, the colour suggests a fruit base, and its shape indicates a liquid. It suggests a storage area for berries or berry mashes stored in fish oil (a preservative) and packed in bentwood boxes, a pattern recorded in ethnographic sources (Boas 1916: 406). No similar stains were found in the excavations of the front quadrant of the building. Martindale's (1999: 273) interpretation of this feature as the result of blueberries is not incorrect, although it probably represents a variety of food berries. Blueberries (*Vaccinium ssp.*) have smaller seeds that may not have been removed

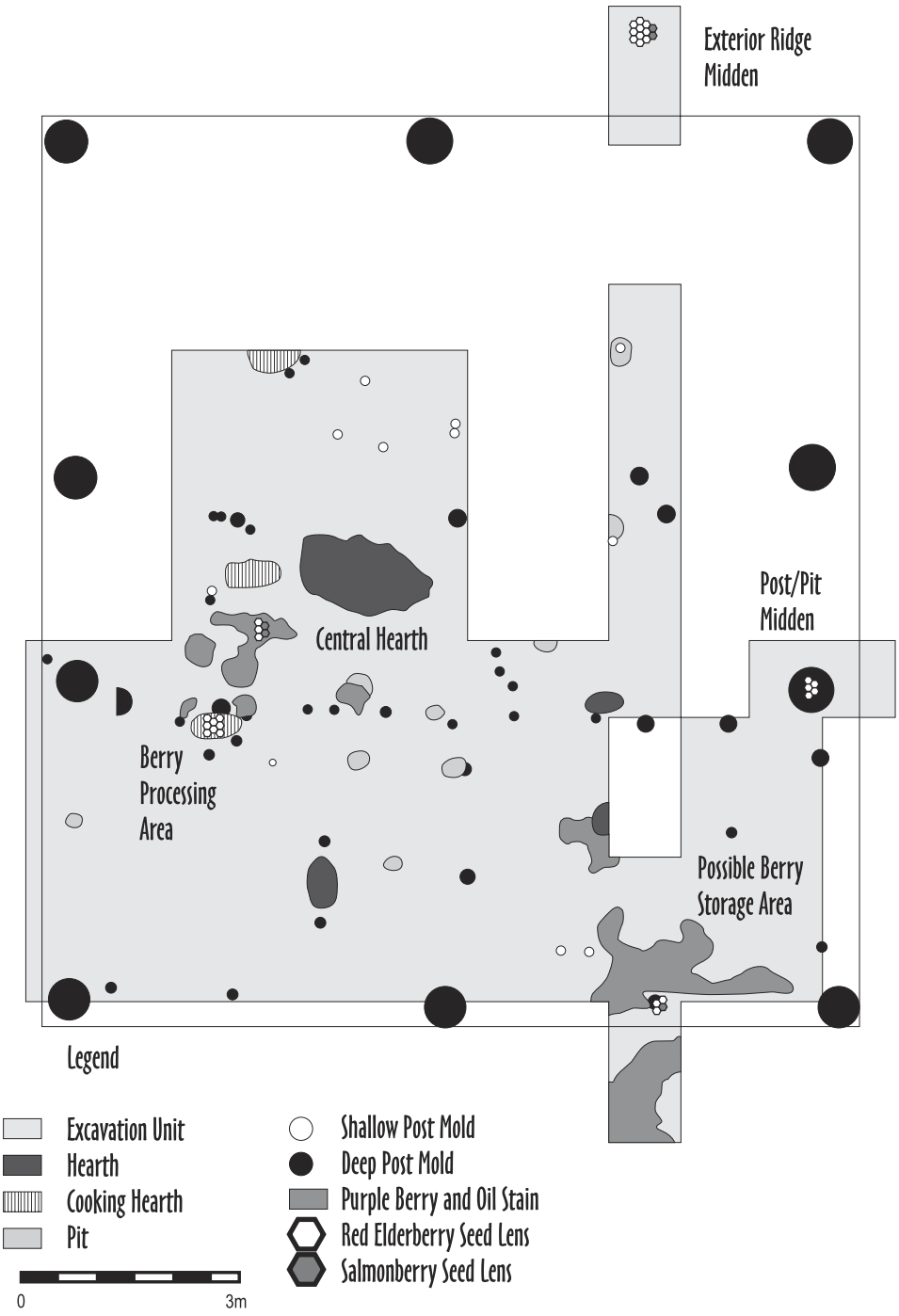

Figure 4. Archaeological features from House 2, Psacelay.

during processing. Unlike elderberries, blueberry seeds are not toxic, and by focusing on seed lenses, we may underestimate the role of these species.

The distribution of seed remains in different occupational components at Psacelay and Ginakangeek provide some data on the changing role of these resources through the contact era. After the earliest components, seen in House 2 at Psacelay, there appear to have been efforts at increasing plant food production. That this occurred after the abandonment of House 2 is clear since the majority of seed remains were deposited in the pits formed by the removal of House 2 posts, while House 1 was still occupied. This transition saw an increase in red elderberry seed deposition from 8.86 g/m^3 to 82.66 g/m^3. However, the comparison between Houses 2 and 1 is not straightforward, since the earlier seed lenses of House 2 were found in floor contexts and exterior ridge middens, while those from House 2 were from the house floor, exterior ridge middens and pit middens. The majority of seeds from House 1 came from the pit middens formed in the abandoned house posts of House 2. No such pit middens were identified with House 2, and the increase in seed remains may reflect differences in disposal of seeds rather than use of berries. If we exclude the pit midden data, the density of seed deposition in House 1 becomes 26.95 g/m^3. There were no hearth features above House 1 or near the pit middens to suggest that the abandoned terrace was used as an activity area. The content of the pit middens was similar to that found in the ridge middens, primarily layers of ash and sand, thus it is possible that the two middens are comparable as deposits of household debris located within a few meters of an occupied house.

Ginakangeek presents a sequential view of the changing role of plant resources in the post-contact era (Table 1). Initially, there is a level of elderberry seeds at Ginakangeek (1.12 g/m^3) lower than that in evidence at House 2, Psacelay (8.86 g/m^3). The exterior middens at Ginakangeek were not excavated to the same degree as at Psacelay, but there is evidence of a significant decline in plant resource use from the peak at House 1, Psacelay. After this, there is a further decline in the use of plant resources through the occupational sequence at Ginakangeek to a much lower level (0.09 g/m^3). It then rebounded somewhat in the late 19th century (0.66 g/m^3) before disappearing in the early 20th century. Although this rebound is modest compared to earlier levels, it is more than a five-fold increase in seed remains.

SPATIAL AND SOCIAL PATTERNS OF ELDERBERRY USE AT PSACELAY

It is stated in ethnographic sources (e.g., Boas 1916: 406; Garfield 1939: 199; 1951: 15; Halpin and Seguin 1990: 270; Miller 1997: 22) and apparently confirmed in our archaeological data that during the late pre-contact era, some extended family households produced surplus foods, such as berries, for storage—an economic resource that was controlled by leading members of the community.

The distribution of berry processing features in the architecture of House 2 at Psacelay reflects both the social organization of the household and its links to resource collection, processing, preparation, and storage. Each perimeter subdivision within the house contained a hearth, one or two pits, and a series of post-mold patterns suggesting non-load bearing walls separating the subunits from each other. A sixth zone

at the center of the house included three cooking hearths around a large central hearth. This area most likely represents common space and facilities shared by the entire extended family. The area outside the house also represents an activity area used by the household and was separated from a similar area in front of House 1 by a drainage channel. Each of these spatial zones coincides to some degree with aspects of the social organization. Areas in front and beside the house would have been accessible to the entire household as well as to members of the neighbouring house. The central space inside House 2 was private to the household, but accessible equally by all members. The subunits against the walls would have been private areas of individual family units of the extended family and represent the most private spaces. Such a layout corresponds with ethnographic descriptions of the design and use of space by Tsimshian households (Boas 1916: 46). The most highly ranked families within the extended lineage owned the spaces at the back of the house, while the units along the sides were owned by families of lesser rank. The lowest ranked space was the common area by the front door where the slaves slept.

The exploitation of berries coordinated activities into a sequence that converted naturally distributed resources into fresh and stored food. We can divide this sequence into a suite of steps: collecting, processing, preparation, and storage or consumption. While collecting is predicated on rights of access to, ownership of, and potentially to the tending of berry grounds, we limit our discussion to the practice and technology involved in harvesting berries and fruit. As mentioned above, the major berry resources used by the Northern Tsimshian grow in a variety of ecological contexts. Favoured species tend to cluster in patches, and were harvested by hand into baskets, sometimes with the assistance of a hooked stick to pull branches low (Turner 1995: 68). There is some evidence that summer houses were located near berry sources to permit ease of access by women who were primarily responsible for childcare. The late pre-contact habitation sites of Psacelay and GbTh–13 are located in old growth forests thick with an understory of blueberry plants (Martindale 1998). However, berries were probably only one factor in the location of summer houses; others included access to a variety of resources and ecozones, such as mountain valleys and rivers.There is mention in the Tsimshian oral record of women traveling by canoe to favored berry grounds (Marsden 2002: 104).

Berries were eaten fresh, but they were also processed to convert them into a form suitable for consumption or storage. Processing berries follows operational steps including de-seeding, destemming, and mashing to a paste that was then eaten as a food, dried into cakes, or mixed with oil for storage (Grumet 1975: 299). Seeds of red elderberry have high levels of toxic cyanide producing glycosides and were removed after cooking or during consumption (Pojar and Mackinnon 1994: 70; Losey *et al.* 2003: 696, 701; Turner 1995: 14). One ethnographically recorded method of making a fruit mash was to dry crushed fruit paste on a layer of skunk cabbage leaves on a cedar-woven trestle frame suspended over a fire for several days. This dried the paste into cake-form for long-term storage. Stewart (1984:102) illustrates such a berry hearth, which matches the archaeological hearth feature found in yard area of House 2.

Short-term drying of berries on such a rack can also produce a moist fruit concentrate, suitable for consumption or for storage by mixing with fish oil and sealing in bent-wood boxes or bladder bags (Boas 1916: 406; Miller 1997: 22; Turner 1995: 16). Had seeds been removed during drying/roasting, we could expect to see substantial seed lenses in the front yard area. Since we instead found the highest concentration of seed lenses in the exterior house middens (Table 2), seed removal appears to have occurred after initial processing and during food preparation, or consumption. Exterior ridge middens generally contain debris generated from inside the houses such as ash from hearths and sand from house floors. Seed lenses were also found inside House 1 associated with both the main hearth and the perimeter cooking hearths. The distribution of seed lenses throughout the interior of House 2 indicates that berry consumption occurred throughout the house and that all household members had access to berry foods. As mentioned above, House 2 contained a purple floor stain that appears to represent leakage in an area used for storing berries in oil. If so, the location of this storage area suggests ownership or control of surplus household berry production by individual families, most likely the house leaders who lived at the rear of the dwelling.

The spatial system at Psacelay appears to correlate with the social network by creating spatial divisions that represented the community (outside the houses), the extended family (central common area within each house) and the nuclear family or equivalent (perimeter subunits). The distribution of seeds and hearth features at Psacelay suggests that collection and initial processing of elderberries was a community-shared activity that became increasingly private as the resources were processed for storage. The entire household shared plant food, but consumption frequently occurred within nuclear families, perhaps indicative of some restricted access to the resource. If cooked berries were stored in grease in House 2, this occurred primarily in the rear of the house, the home of the highest ranked household members. It thus appears that while the community shared in the processing tasks, the product of their work may have been controlled, at least spatially, by the leaders of the houses. The mass of elderberry fruit represented at Psacelay is substantial considering that midden contexts represent less than 20% of the total excavations. These data suggest that plant resources were an important contributor to the traditional subsistence and, through surplus production, the wealth economies of the Northern Tsimshian.

Elderberry Use Through Time at Psacelay And Ginakangeek

Psacelay and Ginakageek represent a sequence of occupation that spans the period of contact with Europeans that began in AD 1787. After contact, the Northern Tsimshian settlement pattern changed and interior sites like Psacelay became depopulated while new sites such as Ginakangeek emerged along the Skeena River. The production of stored food surpluses was the basis of the pre-contact Northern Tsimshian economy by providing sustenance, trade, and the capacity for occupational specialization. By the late 19th century, the Northern Tsimshian economy reorganized from a focus on subsistence production to a market economy as Tsimshian people became fur suppliers, fur traders, fishers, loggers, shippers, labourers, and con-

sumers (McDonald 1984; Marsden and Galois 1995; Martindale 2004a). However, the transformation from subsistence to market economy was not direct, and the early 19th century was a period of transition and synthesis.

Although not widely recognized as such, there are some ethnographic and ethnohistoric data that indicate that plant foods were a significant pre-contact trade and exchange resource, at least for some Northern Tsimshian village groups. Allaire (1984) has argued that Northern Tsimshian village groups are divisible into two conceptual categories: those that produced containers, and those that produced food. The former is associated with coastal territories and older lineages, the latter with interior territories and more recently arrived lineages[11]. This was a symbolic division, as all communities produced both containers and food. However, it represents the ceremonial roles of each community in feasting, which in turn reflect the surplus capacity of subsistence wealth of each community. Allaire (1984: 86, 91) notes that three village groups were associated with the production of plant foods; the Giluts'aaẅ produced crabapples and cranberries, Gitzaxłaał produced dried cakes of hemlock cambium, and the Kitselas produced bundles of dried berries[12]. While fish is recognized as the foundation of the subsistence economy, it is likely that other foods, including plants resources, were produced in excess for trade and exchange.

Martindale (1999, 2000, 2003, 2004a) has argued that the early 19th-century settlement shift correlated with the development of a regional political hierarchy and accommodated the changing economic requirements of the post-contact period. The construction of villages such as Ginakangeek allowed village groups to maintain access to both their traditional food supplies, which were scattered throughout the tributary valleys, and to emerging interior-to-coast trade along the Skeena River. Indeed, it was indigenous leaders' capacity to control the subsistence economy that permitted their control of the market economy. Until the construction of Hudson's Bay Company's Fort Nass in AD 1831, it was not possible for indigenous traders to acquire food through the market exchange of furs. Ship-borne traders brought portable, high-density valuables for trade rather than bulk foodstuffs, and there is some evidence that indigenous consumers disliked European foods (Martindale 2003). The result was that fur trading could only produce wealth, not food. To acquire food, Northern Tsimshian people had to maintain their traditional subsistence economy, and the social relations under which it operated. Thus, the social and political *status quo* of extend family economic units producing surplus food and linked by reciprocal obligations through feasting was maintained and enhanced in the early decades of contact. It was during this time that the Northern Tsimshian and their neighbours established incipient paramount chiefdoms based on both the wealth of the fur trade and the surplus production of the subsistence economy.

This balance was upset during the mid-19th century as individuals began to bypass the social obligations of the traditional food economy and trade directly with the Hudson's Bay Company for food. The expanded opportunities of the market eroded the economic and social ties that linked food producing extended families together and to the larger network of village groups through reciprocal feasting. The result was a

period of political disarray and social tension that culminated in the fragmentation of the Northern Tsimshian community into two groups: adherents to the traditional system of feasting, rank, and reciprocal obligations, who remained at Fort Simpson; and followers of William Duncan, an Anglican missionary who in 1862 established the Christian community of New Metlakatla on Venn Pass. The late 19th century was a period of cultural upheaval and internal discord, the tensions of which were mitigated by a renewed effort to reestablish the pre-contact political system of ranking that ordered the Northern Tsimshian village groups. In 1879, a feast was held to reunite some of the lineages that had left in 1862, and to reconcile conflicted views over unfulfilled ceremonial obligations during the hiatus. These events set the stage for the modern synthesis of pre-contact system of political ranking, and post-contact development of a paramount chiefdom.

Each of these historical developments changed the role of subsistence food production in Northern Tsimshian society, a pattern that may correspond to changes in elderberry seed remains at Psacelay and Ginakangeek. The change from the earliest to latest levels in seed density at Psacelay are substantial (8.86 g/m^3 to 82.66 g/m^3; or 26.95 g/m^3 without pit middens) and correspond with the transition from pre- to post-contact. The earliest levels at Ginakangeek post-date the latest levels at Psacelay and represent a decline in seed density to amounts below the pre-contact level (1.12 g/m^3). Later levels at Ginakangeek show a continued decline in seed density up to about AD 1875 (0.09 g/m^3) followed by an increase in the late 19th-century levels (0.66 g/m^3). Elderberry seeds were not recovered from the most recent levels at Ginakangeek.

The overall pattern is one of declining use of elderberries in the post-contact period, likely related to the power of market exchange, the increasing wealth of Tsimshian communities, and the availability of food supplies from European trading posts. This is expected since the post-contact era included an economic shift away from traditional plant gathering as either an avenue to wealth production or as a mainstay of the subsistence economy. However, the two increases—one in the earliest post-contact levels, and the second between AD 1850–1875—are notable as they oppose the overall trend.

While we cannot exclude the possibility that variation in seed remains was the result of taphonomic or sampling factors, we have tried to account for these. It is possible that fluctuations in the use of elderberries were responses to varying availability of other resources, such as fish, which may have declined after the fur trade and the introduction of commercial fishing in the 1870s. However, Coupland *et al.* (2001) present salmon escapement data for the Skeena Valley that shows that the impact of commercial fishing on salmon stocks was observable only after the mid-20th century. It is also possible that these levels of use are examples of the intensification of elderberry production in the context of food shortage. However, berries in general are unusual resources for intensification as they are available in the late summer and fall, coincident with peak salmon runs. Additionally, general economic shortages would have resulted in a concurrent intensification of salmonberries, not seen in our data, as salmonberries are often preferred over elderberries as a food source (Turner and Davis 1993:180). Differences of seasonality are unlikely to have created these changes

as the shift to year-round occupation of Ginakangeek in the late 19th century does not break the pattern of occupation during the summer-to-fall season when berries are harvested.

We hypothesize that these differences are real, and that they are interpretable as responses to the changing economic conditions of the post-contact era. We argue that the initial increase was a response by Tsimshian communities, especially women (see below), to generate economic surpluses in the early contact era for trade in the emerging wealth economy of imported European goods. This increase in plant remains occurred as the fur trade was emerging as a powerful source of wealth for Tsimshian communities, but at a time when subsistence goods could not be acquired from Europeans. Thus, plant foods were both a traditional means of generating economic surpluses and a part of a necessary subsistence economy. This implies that the Tsimshian were confronting the arrival of the new source of wealth through European trade in part by increasing traditional means of wealth production, surplus food production.

The latter rebound of plants during the 19th century is modest, arguably negligible, although it may also reflect changes in Northern Tsimshian economic activity. This apparent rebound can be interpreted as part of a politicized return to pre-contact ways in the context of conflict with Europeans and dissatisfaction with both the effects of colonization and the accelerated wealth economy of the fur trade era in the early 19th century. The late 19th century increase in elderberry seeds coincided with independent lines of evidence in material culture, which are also interpretable as a return to traditional cultural practices in the late 19th century. We have identified trends in material culture through the same stratigraphic series (Martindale 2004a; Martindale and Jurakic 2004). The overall trends in artifact types show a complete and gradual replacement of traditional artifacts with items of European manufacture. There is a consistent decline in the proportion of personal ornaments and ceramic finewares in the latter half of the 19th century, replaced by more utilitarian objects and ceramic types. In addition, while lithics in general and groundstone tools in particular decline over the 19th century, there is a pattern of dramatic decline between AD 1800 and 1850, followed by a reemergence of these objects in the latter half of the 19th century. This apparent return to groundstone technology coincides with the appearance of ground and flaked tools made from broken bottle fragment (Martindale and Jurakic 2004). These patterns suggest that while the trend of the early contact era was towards a replacement of indigenous artifacts with imported materials, the subsequent period saw a return to more traditional objects as well as a revised use of imported goods. We argue that these trends are interpretable in the context of changing economic and social relations, especially of those involving women. However, we recognize that these material and economic gestures of traditional cultural practices occur in the context of a broader trend towards increasing incorporation of European materials and practices into Tsimshian life. Thus, our conclusions on this latter point are tentative.

PLANT REMAINS AS EVIDENCE OF THE ECONOMIC POWER OF WOMEN

The changes in the use of plant resources through the contact era can be attrib-

uted to the power and agency of women, whose control over plant foods is well documented ethnographically. Cooper (1992–93) and Fiske (1991) have argued that European colonization disproportionately affected women's power within Tsimshian society by simultaneously elevating men's economic activities (hunting, raiding, trading[13]) and undermining those of women (plant collection, food processing). Indeed, the ascendancy of the market economy and the decline of the subsistence food economy allowed men to bypass the economic roles of women much as it allowed individuals to bypass the extended family (Martindale 2003, 2004a). Cooper (1992–93: 47) and Fiske (1991: 515) argue that Tsimshian women's power derived more from their control over food-producing lands, food processing, and food storage than it did from the matrilineal descent rules of their society. Cooper (1992–93: 28) and Martindale (2004a) have noted that the limiting factor in storing fish was the processing work of women. Women did have access to most seats of power including shamanism, membership in secret societies, and political leadership. As with men, ascension to these roles was facilitated by wealth. An expansion of plant production in the early decades of contact is thus interpretable as both an effort by the extended family to increase surplus food production to engage in trade and an effort by women to assert their economic power in concert with the new economic avenues open primarily to men through the fur trade. A decline of plant processing, such as appears in our data in the early-to-mid 19th century, coincided both with a decrease in the value of the subsistence food economy and with increasing efforts by Europeans, especially missionaries, to undervalue the role and power of women (Cooper 1992–93). A reemergence of plant resources in the late 19th century can be interpreted as a reassertion of women's traditional authority in the context of increasing Aboriginal dissatisfaction with Europeans (Fiske 1991: 527).

Such increases in traditional activities appear contradictory to the overall trends of the late 19th century, Martindale (2003, 2004b) has argued that these patterns reflect the multifaceted Tsimshian response to Europeans, which is, in part, explicable in terms of Tsimshian political developments. Two changes to political authority appear to emerge in the context of these developments. First, European society, which had been the source of increased indigenous wealth and power in the early 19th century, became increasingly corrosive to traditional Tsimshian communities. Secondly, indigenous leadership, which had for much of the early 19th century favoured leaders who could successfully navigate the emerging market economy, began to favour those individuals who could maintain social cohesion in the face of colonization. The increase in plant production, the decline of ornamental imports, the return to groundstone tools, and the emergence of expedient glass tools can be hypothesized as material reflections of this changing role of Europeaness in Tsimshian identity. The increase in plant processing and the return to groundstone technology may have been indicators, collective and individual, of the value of traditional avenues of subsistence and wealth. Similarly, the use of glass and the reduction in imported ornaments may be gestures that both controlled European objects for indigenous purposes, and used European waste in a traditional indigenous aesthetic of efficiency and resource-

fulness. Each of these gestures used material culture to create a separation between European and Tsimshian identities at a time when Cooper (1992–93: 61–62) notes that Tsimshians in general and women in particular were confronting such colonial effects as prostitution, missionization, and the rise of the wage labour economy.

These are satisfying explanations since they embody concepts of Aboriginal and female resistance to European acculturation and male authority. However, these patterns are simply exceptions in a broader trend towards Europeanization of Tsimshian material culture. During the late 19th century, at the same time as Tsimshian communities were reordering themselves in the face of increasingly powerful European influences, there are consistent material patterns that suggest incorporation of European values into indigenous life. It is also at this time that we first see the use of European medicinals and cleaning-related objects, clothing, clocks, musical instruments, and art supplies (Martindale 2004b). These materials can be interpreted as gestures of accommodation in which Indigenous people adopt European concepts of illness, fashion, cleanliness, time management, and recreation. These contradictions are both complex and profound as Tsimshian identities were changing, although not necessarily becoming more European or less Indigenous (Carlson 2000). Cooper (1992–93: 44–45) argues that the role of women in Tsimshian life was not eroded as a consequence of colonization in part because of the maintenance of traditional social relations. These may have been enhanced by the resilience of women in maintaining their traditional economic activities, including plant food production.

CONCLUSIONS

It is clear from ethnographic sources that plant materials had complex meanings in Tsimshian life and that their use was part of a gestural and symbolic landscape. Although specific interpretations of the symbolism of plant remains at Psacelay and Ginakangeek are possible, we focus on the more general association of plant resources as a component of a traditional subsistence economy and way of life. The term "traditional" is used here to invoke association with a dynamic Tsimshian, as opposed to European, identity, and not to connote stasis, simplicity, or antiquity. Feit (2004: 112) argues that traditionalness is part of a multifaceted negotiation of identity occurring in any community, but especially powerful in post-contact indigenous contexts. The distinction between *indigenous* and *European* is simplistic, but serves to distinguish between historically established and new economic sources of power in the post-contact context (Martindale 2004a).

The one association that we do make is between plant resources and women. The ethnographic and ethnohistoric data strongly indicate that women collected, processed, prepared, and stored plant foods, and we assume that their use is a reflection of the changing economic capacities of women in the post-contact era. In light of these assumptions, it is reasonable to draw two conclusions. First, that plant resources were a significant part of the traditional economy, providing both food and a source of wealth through surplus production, levels of which responded to changing conditions in the post-contact period. Second, that the syntax and distribution of plant remains at Psacelay and Ginakangeek tracked the changing role of subsis-

tence economics, traditional activities, and the economic capacity of Tsimshian women through a cycle of increase, decline, and modest rebound in the post-contact era.

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NOTES

1. The term Tsimshian can refer to a community of mutually intelligible languages, of which there are four (Coast Tsimshian, Southern Tsimshian, Nishga, and Gitksan), an archaeological culture that summarizes similarities in material culture, subsistence economics and settlement patterns, an ethnographically identified ethnicity, and a contemporary cultural and political indigenous identity. See Garfield (1939) and Halpin and Seguin (1990) for a summary of Tsimshian linguistic and cultural traits and Jones (1997), Meskell (2001), and Shennan (1989) for a complete discussion of the relationship between cultural identity and the concept of archaeological culture areas.
2. The Northern Tsimshian are defined by Martindale and Marsden (2003) as the local groups who formed a defensive alliance after 1500 BP in response to invasion and warfare primarily from northern groups. We prefer this term to the more common synonym, Coast Tsimshian, which properly defines a linguistic rather than cultural or political division. The Northern Tsimshian include the following local groups (known among the Northern Tsimshian as "tribes"): Gitwilgyoots, Ginax'angiik, Gitzaxłaał, Gitsiis, Gitnadoiks, Gitando, Gispaxlo'ots, Gitlaan and Giluts'aaẅ. There was a tenth tribe, the Gitwilkseba, but they became extinct. The interior Tsimshian tribes are the Kitselas and Kitsumkalum. The southern Tsimshian tribes are the Kitkatla, Gitk̲'a'ata, and Kitasoo (Figure 1).
3. See Duer (2002: 142) for a discussion of the limitations of using mutually exclusive categories to subdivide a

gamut of economic activities. Specifically, he confronts the entrenched idea that hunter-gatherers, by definition, did not cultivate plants.

4. Keeley (1999: 9) estimates that 60% of the Tsimshian diet was marine-based animals, while 20% derived from plants and 20% from terrestrial animals.
5. Tsimshian people refer to these divisions as tribes, although in anthropological terms they more closely resemble village groups or local groups (see Johnson and Earle 1987).
6. These were mistakenly identified as blueberry in Martindale (1999), producing incorrect fruit weight estimates.
7. The comparative collection of 32 species of fruits and berry seeds was prepared by Carla and Phil Burton of Symbiosis Research and Restoration, Smithers, B.C. The collection included all edible species reported to have been used by people in the Skeena Valley, along with imported European varieties.
8. Berry weights were calculated in two ways. Berry volume was estimated (1 cc for elderberries, 3.5 cc for salmonberries) and fruit weight estimated from chemical composition listed in Losey *et al.* (2003: 704). Berry mass was also measured directly for a random suite of fruits and estimated to: elderberry, 1±0.025 g; salmonberry, 3.5±0.5 g.
9. Losey *et al.* (2003: 700) estimate archaeological elderberry seed weight to be 0.000625 g or 1,600 seeds per gram.
10. Grams of seeds per cubic meter is convertible into seeds per litre: 1 g/m^3 = 2,000 seeds/m^3 = 2 seeds/liter, based on our estimates of archaeological seed weight.
11. See Martindale and Marsden (2003) for a detailed discussion of the development of Tsimshian village groups and the migration of lineages into Tsimshian territory.
12. Allaire refers to these groups as the Gilludzars, Gitwilksebau (or Kitwilksebau), and Kitselas, respectively. See Halpin and Seguin (1990: 283) for a discussion of synonyms. The Gitwilkseba no longer exist; their members were absorbed into the Gluts'aaw and the Gitando and the Gispaxlo'ots (Susan Marsden, pers. comm. June 2004)
13. Both Cooper (1992–93) and Fiske (1991) note that women participated in the trade with Europeans, although the activity was predominantly conducted by males.

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