APPENDIX 2

Faunal Report for Select Units from 2015 and 2016 Excavations at 49-SIT-963, Kruzof Island, Alaska

By

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(April 11, 2017)

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ABSTRACT

A total of 2,896 faunal specimens were analyzed from eight analytical units of the 49-SIT-963 site, located on Kruzof Island, Alaska. The faunal remains had varying degrees of association with the survivors of the *Neva* shipwreck of January 1813. The most secure association with the survivors comes from the North Block and the Survivors Terrace Midden and Burial assemblages which produced the remains of harbor seal, Sitka black-tailed deer, and eagle, with a few remains of salmon or trout and lingcod. All of these species could have been caught by the *Neva* survivors in winter. Excavation unit N105/E101.5, which is probably not associated with the *Neva* survivors, produced a very different faunal assemblage dominated by sea otter and American beaver. Sea otter would have been difficult for the survivors to hunt without boats or the requisite skills. Because it is unclear whether American beaver existed on Kruzof Island prior to ca. 1925, their remains could provide ancient DNA for future phylogenetic research into island endemism.

INTRODUCTION

This report describes the results from analysis of faunal remains recovered from the 2015 and 2016 excavations at 49-SIT-963, on Kruzof Island, Alaska, under contract to David McMahan. Faunal remains were recovered from many different areas of the site, with varying degrees of association with the survivors of the *Neva* shipwreck of January 1813. The faunal assemblage reported here is from eight analytical units, not including the Kitchen Terrace area (fauna recovered from that area has not been analyzed by the author and is not covered in this report). Included are six proveniences on the Survivor's Terrace (midden, burial, Block 1 or North Block, Block 2 or South Block, N105 E101.5, and N102 E101), plus a metal detector probe unit (MD-A2). The remaining analytical unit includes fauna from the sod layer separated out due to its possible more-recent age, as well as fauna from uncertain proveniences. Based on artifact distributions and stratigraphy, site areas with the most secure association with the survivors of the *Neva* shipwreck are the North Block, the Survivors Terrace Midden, and the Survivors Terrace Burial. The South Block appears to contain materials from the 1813 shipwreck survivors as well as a later mid-nineteenth century use of the site. The association of other areas of the site is less clear.

METHODS

The basic analytical unit used in the analysis was an individual bone or bone fragment, referred to as a "specimen." Each specimen was examined and identified to taxon, element, portion, landmark and side as possible. Element portions used in this analysis are modified from those defined by Todd (1987). Specimens not identified to element were coded as "longbone" or "unidentified" as appropriate. Longbone shaft fragments were coded as "shaft" when more than 1/2 of the diameter was present and "shaft flake" when less than 1/2 of the diameter was present.

Identified bones were assigned to taxon by direct comparison with modern osteological specimens housed at the Zooarchaeology Laboratory at Central Washington University, the Burke Museum in Seattle, and with published reference manuals (*e.g.*, Gilbert 1990; Post 2004, 2014). Mammals not identified to taxon were placed as possible into Thomas's (1969) five size class system, with an additional class (VI) for very large mammals over 200 kg (*e.g.,* elk, sea lion). Identifications were made conservatively due to bone fragmentation. All taxa with present or historic distributions along the southeastern Alaska panhandle were considered for comparison. The potential taxa are based upon the geographic distributions provided by the Alaska Department of Fish and Game ([ADF&G] 2015), Mecklenburg et al. 2002, and Whitaker (1980). Taxonomic names follow the Integrated Taxonomic Information System (2016) online.

A number of taphonomic and other variables were recorded for each specimen: burning, weathering stage, root etching, breakage type, age indicators, and maximum length. Weathering stage was recorded as Stage 0 (unweathered) to Stage 5 (falling apart) after Behrensmeyer (1978), Lyman and Fox (1989), and Todd et al. (1987). The surface of each specimen was examined with the use of a 15X hand lens for signs of modification (*e.g.*, cutmarks, rodent gnawing).

All faunal data were entered into an Excel spreadsheet. Taxonomic abundance was measured using both number of identified specimens (NISP; Payne 1975) and minimum number of individuals (MNI; White 1953) counts. Discrete bone morphological features ("landmarks") and bone portions of each element were used to calculate the minimum number of elements (MNE; Bunn 1982). MNI estimates were calculated by taking the highest count of left or right MNE for each taxon. A minimum distinction approach was taken where size and visual comparisons were not used for minimum number estimates.

RESULTS

A total of 2,896 faunal specimens were identified from 49-SIT-963, 978 from the 2015 excavations and 1,918 from the 2016 excavations (Table 1). The faunal assemblage came from seven different areas of the site, plus an unassigned analytical unit (e.g. from the sod layer). Excavation Unit N105/E101 produced the largest assemblage at 44% (1,279/2,896) of NISP.

The majority of the faunal specimens (not including the three shell) recovered from the site as a whole were calcined or blackened (99%; 2,857/2,893); only 24 bone specimens showed no signs of burning, while 12 specimens exhibited staining possibly from burning. The majority of the specimens were highly fragmented. For example, only 8% (191/2,411) of the mammal remains were identified beyond a size class.

Table 1: 49-SIT-963 Faunal Counts by Analytical Unit

Analytical Unit	NISP
1) Survivors Terrace Midden (N134/E99 & N135/E99)	300
2) Survivors Terrace Burial (N134/E99 & N135/E99)	278
3) Block 1 (North Block-Survivors Terrace)	63
4) Block 2 (South Block-Survivors Terrace)	906
5) N105/E101.5 (Survivors Terrace)	1,279
6) N102/E101 (Survivors Terrace)	11
7) Metal Detector Locate Test (MD A-2)	37
8) Other (e.g., sod layer and other unassigned proveniences)	22
Total	2,896

Identified taxa include American beaver *(Castor canadensis*), Steller sea lion (*Eumetopias jubatus*), harbor seal (*Phoca vitulina*), sea otter (*Enhydra lutris*), mink or marten (Subfamily Mustelinae), Sitka black-tailed deer (*Odocoileus hemionus sitkensis*), eagle (*Haliaeetus leucocephalus/Aquila chrysaetos*), salmon or trout (*Oncorhynchus* sp.), lingcod (*Ophiodon elongatus*), rockfish (*Sebastes* sp.), halibut (*Hippoglossus stenolepis*), and Black Katy chiton (*Katherina tunicata*) (Table 2). Detailed faunal results for each of the eight analytical units are described below.

Table 2: Summary Faunal Remains from 49-SIT-963

Order	**Taxon**	**Common Name**	**NISP**
Class Polyplacophora (chitons)			
Neoloricata	*Katherina tunicata*	Black Katy Chiton	3
Class Actinopterygii (Ray-finned Fishes)			
Salmoniformes	*Oncorhynchus* sp.	Salmon /trout	6
Scorpaeniformes	*Ophiodon elongatus*	Lingcod	1
	Sebastes sp.	Rockfish	3
Pleuronectiformes	*Hippoglossus stenolepis*	Pacific halibut	1
	Unidentified	Flatfish	2
Unknown	Unidentified	Unidentified fish	17
Class Aves (Birds)			
Accipitriformes	*Haliaeetus leucocephalus/Aquila chrysaetos*	Bald or golden eagle	1
	Family Accipitridae	Hawk or eagle	5
Unknown	Unidentified	Unidentified bird	167
Class Mammalia (Mammals)			
Rodentia	*Castor canadensis*	American beaver	13
Carnivora	*Eumetopias jubatus*	Steller sea lion	2
	Phoca vitulina	Harbor seal	27
	Subfamily Lutrinae	Sea otter or river otter	1
	Enhydra lutris	Sea otter	105
	Subfamily Mustelinae	Mink or marten	1
Artiodactyla	*Odocoileus hemionus sitkensis*	Sitka black-tailed deer	42
Unknown	Size Class III	Mink-sized	3
	Size Class III-IV	Mink to otter-sized	3
	Size Class IV	Beaver or sea otter-sized	284
	Size Class IV-V	Sea otter to deer-sized	697
	Size Class V	Deer or seal-sized	921
	Size Class VI+	Sea lion-sized or greater	1
	Unidentified	Unidentified mammal	311
		Total Identified to Class	2,617
		Unidentified	279
		Total	2,896

1) Survivors Terrace Midden

The Survivors Terrace Midden consists of a small assemblage of 300 faunal remains recovered from Levels 2 and 3 of excavation unit N134/E99 and Level 3 of excavation unit E135/E99. All specimens were either blackened or calcined. Identified taxa include Sitka black-tailed deer, bald eagle or golden eagle, salmon or trout, and lingcod (Table 3).

Table 3: Survivors Terrace Midden Faunal Remains

Order	Taxon	Common Name	NISP
Class Actinopterygii (Ray-finned Fishes)			
Salmoniformes	*Oncorhynchus* sp.	Salmon/trout	3
Scorpaeniformes	*Ophiodon elongatus.*	Lingcod	1
Unknown	Unidentified	Unidentified fish	8
Class Aves (Birds)			
Accipitriformes	*Haliaeetus leucocephalus/Aquila chrysaetos*	Bald eagle/Golden eagle	1
	Subfamily Accipitrinae	Hawk or Eagle	4
Unknown	Unidentified	Unidentified bird	99
Class Mammalia (Mammals)			
Artiodactyla	*Odocoileus hemionus sitkensis*	Sitka black-tailed deer	7
Unknown	Size Class IV	Sea otter -size	1
	Size Class V	Deer-sized	8
	Size Class IV-V	Sea otter to deer-size	24
		Total Identified to Class	156
		Unidentified	144
		Total	300

1) Sitka Black-tailed Deer (*Odocoileus hemionus sitkensis*): A total of seven specimens were identified as Sitka black-tailed deer. They include a calcined complete right magnum, a calcined metapodial fused distal epiphysis fragment, a calcined complete proximal sesamoid, a calcined complete accessory third phalanx, a calcined first phalanx distal unfused diaphysis, a calcined first phalanx fused distal shaft fragment, and a calcined third phalanx proximal shaft fragment.

1) Large Mammal: Another eight specimens identified as mammal Size Class V (deer-size) include a calcined longbone shaft likely from a deer and seven calcined fragments from unknown elements.

A single specimen was identified as Mammal Size Class IV (sea otter-size): a calcined phalanx shaft fragment. Another 24 specimens were identified as Mammal Size Class IV-V (sea otter to deer-size). They include a calcined longbone shaft flake and 23 calcined fragments from unknown elements.

1) Hawk/Eagle (Family Accipitridae): A single calcined left coracoid fragment was identified as either Bald Eagle or Golden Eagle. Another four specimens were identified as large hawk or eagle. They include a blackened third phalanx proximal shaft fragment, a calcined third phalanx proximal shaft fragment, and two calcined phalanx distal shaft fragments. An additional 99 specimens identified only to the bird class are from a large bird or birds and may be the remains of a hawk or eagle as well. They include a calcined left coracoid fragment, a calcined right coracoid proximal fragment, two calcined coracoid (sides unknown) fragments, a calcined left ulna proximal shaft fragment, a calcined right ulna distal shaft fragment, a calcined left fibula proximal shaft fragment, a calcined right fibula proximal shaft fragment, a calcined left innominate acetabulum fragment, 69 calcined longbone shaft fragments, a calcined phalanx proximal shaft fragment, and 20 calcined fragments from unknown elements.

1) Salmon or Trout (*Oncorhynchus* sp.): A calcined thoracic vertebra centrum fragment and a calcined vertebra centrum fragment were identified as salmon or trout.

1) Lingcod (*Ophiodon elongatus*): A calcined premaxilla fragment was identified as lingcod.

1) Unidentified Ray-finned Fishes (Class Actinopterygii): An additional 144 specimens were so fragmentary that they were not assigned to a class. All are calcined fragments from unknown elements.

1) Unknown Class: A total of 144 specimens were so fragmentary that they were not assigned to a class. All are calcined fragments from unknown elements.

2) Survivors Terrace Burial

The Survivors Terrace Burial consists of a small assemblage of 278 faunal specimens recovered from Levels 4 and 5 of excavation units N134/E99 and E135/E99. The majority (99%; 275/278) are calcined; two are possibly calcined and one is unburnt. Identified taxa are similar to those recovered from the Survivor's Terrace Midden and include Sitka Black-tailed deer, hawk or eagle, and salmon or trout (Table 4).

Table 4: Survivor's Terrace Burial Faunal Remains

Order	Taxon	Common Name	NISP
Class Actinopterygii (Ray-finned Fishes)			
Salmoniformes	*Oncorhynchus* sp.	Salmon/trout	1
Class Aves(Birds)			
Accipitriformes	Subfamily Accipitrinae	Hawk or Eagle	1
Unknown	Unidentified	Unidentified bird	68
Class Mammalia (Mammals)			
Artiodactyla	*Odocoileus hemionus sitkensis*	Sitka black-tailed deer	3
Unknown	Size Class III	Mink-size	1
	Size Class IV	Sea otter -size	3
	Size Class V	Deer-sized	10
	Size Class IV-V	Sea otter to deer-size	40
	Unidentified	Unidentified mammal	28
		Total Identified to Class	155
		Unidentified	123
		Total	278

2) Sitka Black-tailed Deer (*Odocoileus hemionus sitkensis*): A total of three specimens were identified as Sitka black-tailed deer. They include a calcined second phalanx proximal shaft fragment, a calcined complete third phalanx, and a calcined third phalanx proximal epiphysis fragment. An additional 10 specimens identified as Mammal Size Class V (deer-size) are from land mammals and are likely deer remains as well. They are all calcined longbone shaft flakes.

2) Small Mammal: A single specimen was identified as Mammal Size Class III (mink-size): a calcined right astragalus fragment.

2) Large Mammal: Another three specimens were identified as Mammal Size Class IV (sea otter-size). They include a calcined cranial fragment, a calcined rib shaft fragment, and a calcined phalanx distal shaft fragment. An additional 40 specimens were identified as Mammal Size Class IV-V (sea otter to deer-size). All are fragments from unknown elements (one unburnt; 39 calcined).

2) Mammal (Size Class Unknown): Some 28 specimens were so fragmentary that they were not assigned to a mammal size class. All are calcined fragments from unknown elements.

2) Bird (Class Aves): A single calcined left tarsometatarsus distal shaft fragment was identified as large hawk or eagle. Another 68 specimens were identified as medium to large bird. They include a calcined right quadrate fragment, a calcined second vertebra centrum fragment, a possibly calcined vertebra centrum fragment, a calcined vertebra neural arch fragment, two calcined tarsometatarsus distal epiphysis condyle fragments, a calcined tarsometatarsus shaft fragment, a tarsometatarsus shaft flake, 51 calcined longbone shaft flakes, and eight calcined fragments from unknown elements.

2) Salmon/Trout (*Oncorhynchus* sp.): A single calcined precaudal vertebra centrum was identified as salmon or trout.

2) Unknown Class: A total of 123 specimens were so fragmentary that they were not assigned to a class. All are fragments from unknown elements (one possible calcined; 122 calcined).

3) North Block of the Survivors Terrace

The North Block faunal assemblage includes all bone recovered from below the sod layer in the following excavation units: N115/E100, N117/E100, N115/E101, and N117/E101. No fauna was recovered from units N114/E100, N116/E100, N118/E100, N114/E101, N116/E101, N118/E102, N121/E99, and N113/E100. The North Block produced a small assemblage of 63 faunal specimens (Table 5). All were calcined, except for the shell remains. Identified taxa include harbor seal, Sitka black-tailed deer, and Black Katy chiton.

Table 5: North Block Faunal Remains

Order	Taxon	Common Name	NISP
Class Polyplacophora (Chitons)			
Neoloricata	*Katherina tunicata*	Black Katy Chiton	2
Class Mammalia (Mammals)			
Carnivora	*Phoca vitulina*	Harbor seal	5
Artiodactyla	*Odocoileus hemionus sitkensis*	Sitka black-tailed deer	4
Unknown	Size Class IV-V	Sea otter to deer-sized	2
	Size Class V	Deer-sized	50
		Total Identified to Class	63
		Unidentified	0
		Total	63

3) Harbor Seal (*Phoca vitulina*): A total of five specimens were identified as harbor seal. They include an unfused radius proximal epiphysis fragment and four specimens from one or more flippers: a right second metatarsal shaft fragment, a right second phalanx diaphysis and fused distal epiphysis, a right first phalanx diaphysis and fused distal epiphysis, and an unknown metatarsal shaft fragment. Since the proximal radius fuses around four years of age, the unfused radius proximal epiphysis from the site would be from an individual younger than four years (Stora 2000:Table 7).

3) Sitka Black-tailed Deer (*Odocoileus hemionus sitkensis*): A total of four specimens were identified as Sitka black-tailed deer. They include a right humerus shaft flake with green breakage, a right scaphoid fragment, a left ulna proximal epiphysis, and a metatarsal shaft flake. The humerus exhibited a series of small cutmarks below the nutrient foramen and just above the supracondylar fossa.

3) Large Mammal: Another 50 specimens identified as Mammal Size Class V (deer-sized) may be from deer or harbor seal. Over half of these (56%; 28/50) are from land mammals and are very likely deer: two radius shaft flakes, an ulna shaft fragment, a phalanx distal shaft fragment, and 24 land mammal longbone shaft flakes (three with green breakage). The remaining 22 specimens are fragments from unknown elements and could be from land or sea mammals.

An additional two specimens, both fragments from unknown elements were identified as Mammal Size Class 45 (sea otter to deer-size) and could be from land or sea mammal.

3) Black Katy Chiton (*Katerina tunicata*): A total of two shell plates were identified as Black Katy chiton.

4) South Block of the Survivors Terrace

The South Block faunal assemblage includes all bone recovered from below the sod layer in the following excavation units: N108/E101, N109/E101, N110/E101, N108/E102, N109/E102, and N110/E102. No bone was recovered from unit N107/E102. The South Block produced a total of 906 faunal specimens (Table 6). The majority were burnt (97%; 883/906); 20 were unburnt and three exhibited staining, possibly due to burning. Identified taxa include Stellar sea lion, harbor seal, Sitka black-tailed deer, salmon or trout and rockfish.

Table 6: South Block Faunal Remains

Order	Taxon	Common Name	NISP
Class Actinopterygii (Ray-finned Fishes)			
Salmoniformes	*Oncorhynchus* sp.	Salmon/trout	1
Scorpaeniformes	*Sebastes* sp.	Rockfish	2
Unknown	Unidentified	Unidentified fish	4
Class Mammalia (Mammals)			
Carnivora	*Eumetopias jubatus*	Steller sea lion	1
	Phoca vitulina	Harbor seal	14
Artiodactyla	*Odocoileus hemionus sitkensis*	Sitka black-tailed deer	28
Unknown	Size Class V	Deer-sized	837
	Size Class VI+	Sea lion-sized or greater	1
	Unidentified	Unidentified mammal	14
		Total Identified to Class	902
		Unidentified	4
		Total	906

4) Stellar Sea Lion (*Eumetopias jubatus*): A single specimen was identified as Stellar sea lion: a calcined second phalanx distal shaft fragment.

4) Harbor Seal (*Phoca vitulina*): A total of 14 specimens were identified as harbor seal. They include a calcined cervical vertebra zygopophysis fragment, a calcined lumbar vertebra zygopophysis fragment, three vertebra centrum fragments, a calcined innominate acetabulum and

pubis fragment, a longbone epiphysis fragment, two calcined first phalanx proximal diaphysis fragments, a calcined first phalanx unfused proximal epiphysis, a calcined second phalanx diaphysis and fused distal epiphysis, two calcined phalanx proximal epiphysis fragments, and a stained/possibly burnt phalanx proximal epiphysis fragment.

4) Sitka Black-tailed Deer (*Odocoileus hemionus sitkensis*): A total of 28 specimens were identified as Sitka Black-tailed deer. They include a calcined right temporal fragment of the external auditory meatus, a calcined atlas vertebra fragment, a calcined humerus distal epiphysis (condyle) fragment, two calcined right radius distal epiphysis fragments, two right astragalus fragments (one calcined; one stained/possibly burnt), a calcined complete right unciform, a calcined right metacarpal proximal shaft fragment with a cutmark (likely made by a metal blade; see O'Conner 2008:46), a calcined metacarpal shaft fragment, a calcined rib proximal shaft fragment, an unburnt lumbar vertebra centrum epiphysis fragment, a calcined lumbar vertebra zygopophysis fragment, four calcined metatarsal shaft flakes, an unburnt metapodial distal shaft fragment, four complete sesamoids (three calcined; one stained/possibly burnt), two calcined first phalanx proximal shaft fragments, a calcined second phalanx distal shaft fragment, a calcined complete third phalanx, a calcined accessory metapodial distal shaft fragment, and a calcined accessory first phalanx proximal shaft fragment with two narrow cutmarks with no shouldering (likely made by a metal blade; see O'Conner 2008:46).

4) Large Mammal: A total of 837 specimens were so fragmentary, that they were not identifiable as seal or deer, but were assigned to a mammal size class: Size Class V (deer or seal-size). Of these, 314 were identifiable as land mammal and are likely from deer. They include a calcined lumbar vertebra zygopophysis fragment, a calcined rib proximal shaft fragment, 155 calcined longbone shaft flakes (one with a single cutmark likely made by a metal blade), and 157 calcined fragments from unknown element. Another 24 specimens were identifiable as sea mammal and are likely from harbor seal. All are calcined fragments from unknown elements. The remaining 499 Mammal Size Class V specimens are either sea mammal or land mammal remains. They include two calcined tooth fragments, three calcined cranial fragments, a calcined lumbar vertebra zygopophysis fragment, two calcined vertebra centrum fragments, four calcined vertebra centrum epiphysis fragments, a calcined rib shaft fragment, and 486 fragments from unknown elements (17 unburnt; 469 calcined -- one with possible cutmarks, one with possible chopmarks).

A single specimen was identified as Mammal Size Class VI (sea lion-size): an unburnt fragment from an unknown element.

4) Mammal (Size Class Unknown): An additional four specimens were not identifiable to a mammal size class. All are calcined fragments from unknown elements.

4) Salmon/Trout (*Oncorhynchus* sp.): A single calcined caudal vertebra centrum was identified as salmon or trout.

4) Rockfish (*Sebastes* sp.): A calcined left quadrate fragment and a calcined thoracic vertebra fragment were identified as rockfish. A measurement of 11.5 mm across the proximal quadrate articulation (Orchard's measurement #3; see Orchard 2003) produced an estimate live total length for this rockfish of 66 cm. Another four specimens were not identified beyond the class Bony

Fishes. They include two calcined vertebra centrum fragments and two calcined fragments from unknown elements.

4) Unknown Class: A total of four specimens were so fragmentary that they were not assigned to a class. All are calcined fragments from unknown elements.

5) N105/E101.5 (Survivors Terrace)

Excavation Unit N105/E101 produced the largest faunal assemblage from the *Neva* site: 1,279 faunal specimens. The majority (99%; 1,271/1,279) of the specimens were blackened or calcined; two were unburnt and six were possibly calcined. Identified taxa include American beaver, harbor seal, sea otter, and Pacific halibut (Table 7).

Table 7: N105/E101.5 (Survivors Terrace) Faunal Remains

Order	Taxon	Common Name	NISP
Class Actinopterygii (Ray-finned Fishes)			
Pleuronectiformes	*Hippoglossus stenolepis*	Pacific halibut	1
	Unidentified	Flatfish	2
Unknown	Unidentified	Unidentified fish	4
Class Mammalia (Mammals)			
Rodentia	*Castor canadensis*	American beaver	13
Carnivora	*Phoca vitulina*	Harbor seal	8
	Subfamily Lutrinae	Sea otter or river otter	1
	Enhydra lutris	Sea otter	105
	Subfamily Mustelinae	Mink or marten	1
Unknown	Size Class III	Mink-sized	2
	Size Class III-IV	Mink to sea otter-sized	3
	Size Class IV	Beaver or sea otter-sized	279
	Size Class IV-V	Sea otter to seal-sized	584
	Unidentified	Unidentified mammal	268
		Total Identified to Class	1271
		Unidentified	8
		Total	1279

5) American Beaver (*Castor canadensis*): A total of 13 specimens were identified as American beaver. They include a calcined cranial zygomatic fragment, a calcined left humerus distal epiphysis fragment, a calcined left triquetal carpal, a calcined complete left fourth metacarpal, a calcined complete fifth metacarpal, a calcined complete right internal cuneiform, a calcined rib shaft fragment, a calcined lumbar vertebra centrum fragment, a calcined complete left patella, a calcined right fibula shaft fragment, a calcined complete right fourth metatarsal, a calcined phalanx distal shaft fragment, and a calcined complete third phalanx.

5) Harbor Seal (*Phoca vitulina*): A total of eight specimens were identified as harbor seal. They include two calcined temporal bulla fragments, a calcined left fourth metacarpal proximal shaft fragment, a calcined right navicular tarsal fragment with three narrow cutmarks with no shouldering likely made by metal knives (see O'Conner 2008:46), a calcined phalanx proximal shaft fragment, a calcined phalanx proximal epiphysis fragment, and two calcined phalanx distal shaft fragments.

5) Sea Otter (*Enhydra lutris*): A total of 105 specimens were identified as sea otter. They include a calcined mandibular second molar, a calcined molar fragment, two calcined left scapula distal glenoid fossa fragments, a calcined scapula border fragment, a calcined right humerus proximal shaft fragment, a calcined right radius unfused proximal epiphysis fragment, two calcined right radius proximal shaft fragments, a calcined right radius unfused distal epiphysis, a calcined left ulna semi-lunar notch fragment, a calcined complete cuboid, two complete calcined right scapholunars, a calcined complete first metacarpal, a calcined third metacarpal fused proximal epiphysis and diaphysis, a calcined fourth metacarpal proximal shaft fragment, a calcined left fifth metacarpal proximal shaft fragment, a calcined first vertebra neural arch fragment, two calcined first vertebra zygopophysis fragments, an unburnt cervical vertebra zygopophysis fragment, a calcined thoracic vertebra zygopophysis fragment, two lumbar vertebra centrum fragments (one unburnt; one possibly calcined), two lumbar vertebra dorsal spinous process fragments (one unburnt; one calcined), four calcined lumbar vertebra zygopophysis fragments, six complete caudal vertebrae (five calcined; one possibly calcined), four calcined caudal vertebra centrum fragments, an unfused calcined caudal vertebra centrum epiphysis, a calcined vertebra centrum fragment, a calcined vertebra dorsal spinous process fragment, two calcined rib proximal shaft fragments, a calcined rib shaft fragment, a calcined right innominate acetabulum and ilium fragment, a calcined left femur proximal epiphysis greater trochanter fragment, a calcined left femur distal shaft fragment, a calcined femur (side unknown) head fragment, a calcined mostly complete left patella, a calcined complete right patella, two calcined mostly complete right patella fragments, a calcined right tibia distal epiphysis fragment, a calcined right tibia distal shaft fragment, a calcined tibia shaft flake, an unfused calcined left fibula distal epiphysis, an unburnt right fibula proximal shaft fragment, a calcined right fibula distal shaft fragment, two calcined complete first cuneiforms, a calcined complete third cuneiform, a calcined first cuneiform fragment, a calcined mostly complete left astragalus, two calcined left astragalus fragments, a calcined mostly complete right astragalus, three calcined right astragalus fragments, a calcined left calcaneus proximal shaft fragment, a calcined right second metatarsal proximal shaft fragment, two left third metatarsal proximal shaft fragments (one blackened; one calcined), a blackened right third metatarsal proximal shaft fragment, a calcined right fourth metatarsal proximal shaft fragment, a calcined right fifth metatarsal proximal epiphysis fragment, six calcined metatarsal distal shaft fragments, two calcined first phalanx proximal shaft fragments, five calcined complete phalanges, seven calcined phalanx proximal shaft fragments, a calcined phalanx unfused proximal diaphysis fragment, and five calcined phalanx distal shaft fragments.

The sea otter remains represent a minimum of two individual sea otters (based on two left scapulas, two right scapholunars, etc.). They also appear to represent most of the animal. Faunal specimens come from a variety of body parts, including cranial, axial (e.g., scapula, vertebra), forelimb and hindlimb.

5) Sea Otter or River Otter (Subfamily Lutrinae): A single specimen was identified as either sea otter or river otter: a complete calcined third or external cuneiform.

5) Mink or Martin (Subfamily Mustelinae): A single calcined complete right astragalus was identified as either mink or martin.

5) Small Mammal: A calcined caudal vertebra centrum and a calcined thoracic vertebra neural arch fragment were identified as Mammal Size Class III (mink-size). Another three specimens were identified as Mammal Size Class III-IV (mink to beaver-size). They include a calcined scapula border fragment and two calcined fragments from unknown elements.

5) Large Mammal: A total of 279 specimens were identified as Mammal Size Class IV (beaver or sea otter-size). They include two calcined cranial lateral alveolar fragments, a calcined occipital fragment, four calcined cranial fragments, two calcined molar fragments, two calcined tooth enamel fragments, a calcined first vertebra unfused half of a neural arch, a calcined cervical vertebra centrum fragment, a calcined lumbar vertebra neural arch and dorsal spinous process fragment, two calcined lumbar vertebra zygopophysis fragments, a calcined caudal vertebra centrum epiphysis fragment, a calcined vertebra centrum epiphysis fragment, six calcined vertebra centrum fragments, six vertebra fragments (three possibly calcined; six calcined), four calcined vertebra zygopophysis fragments, two calcined rib proximal shaft fragments, a calcined rib distal diaphysis fragment, 13 calcined rib shaft fragments, two calcined scapula blade fragments, five calcined carpal or tarsal fragments, a calcined left astragalus fragment, a calcined astragalus fragment, a calcined metapodial diaphysis fragment, a calcined metapodial distal epiphysis fragment, two calcined metapodial distal shaft fragments, a calcined metapodial shaft fragment, a calcined sesamoid fragment, a calcined phalanx proximal unfused diaphysis fragment, a calcined phalanx proximal shaft fragment, two calcined phalanx distal shaft fragments, a calcined phalanx shaft fragment, a calcined complete third phalanx, and 208 calcined fragments from unknown elements.

Another 584 specimens were identified as Mammal Size Class IV-V (beaver to seal-size). They include nine calcined cranial fragments, a calcined incisor fragment, a calcined lumbar vertebra zygopophysis fragment, a calcined cervical vertebra centrum fragment, three calcined caudal vertebra centrum fragments, six calcined vertebra centrum fragments, four calcined vertebra fragments, a calcined vertebra neural arch fragments, four calcined vertebra zygopophysis fragments, two calcined rib proximal shaft fragments, two calcined rib shaft fragments, a calcined rib distal shaft fragment, a calcined femur proximal epiphysis fragment, a calcined metapodial unfused distal epiphysis, and 547 fragments from unknown elements (one blackened; 546 calcined).

5) Mammal (Size Class Unknown): A total of 268 specimens were so fragmentary that they were not identified to a mammal size class. They include a calcined cranial fragment and 267 calcined fragments from unknown elements.

5) Pacific Halibut (*Hippoglossus stenolepis*): A single possibly calcined caudal vertebra centrum fragment was identified as Pacific halibut.

5) Unidentified Flatfish (Order Pleuronectiformes): A total of two vertebra centrum fragments (one calcined; one possibly calcined) were identified as flatfish.

5) Unidentified Ray-finned Fishes (Class Actinoptygerii): A total of four specimens were identified only as bony fish (Class Osteichthyes). They include a calcined vertebra centrum fragment and two calcined fragments from unknown elements.

5) Unknown Class: A total of eight specimens were so fragmentary that they were not assigned to a class. All are calcined fragments from unknown elements.

6) N102/E101 (Survivors Terrace)

Excavation Unit N102/E101 produced the smallest faunal assemblage from the *Neva* site: 11 faunal specimens. All were calcined. A single left ulna unfused distal epiphysis was identified as Stellar sea lion. The remaining 10 specimens were Mammal Size Class IV-V (otter to seal-size) fragments from unknown elements.

7) Metal Detector Locate Test (MD A-2)

Metal detector locate test MD A-2 produced a small assemblage of 37 specimens. All were calcined. They include six Mammal Size Class V (deer-size) longbone shaft flakes and 31 Mammal Size Class IV-V (otter to deer-size) fragments from unknown elements.

8) Other Proveniences

Some 22 faunal specimens came from contexts that could not be assigned to a particular analytical unit.

A total of 11 specimens came from the sod layer of the North Block. They include a Black Katy chiton shell plate, six calcined Mammal Size Class V (deer-size) longbone shaft flakes, two calcined Mammal Size Class V (deer-size) fragments from unknown elements, one calcined Mammal Size Class IV-V (otter to deer-size) fragment from an unknown element, and a calcined salmon or trout caudal vertebra centrum. All of these specimens are similar to those identified from below the sod layer of the North Block. Additionally, a calcined Mammal Size Class IV-V (otter to deer-size) fragment from an unknown element was recovered from the North Block but could not be assigned definitively to a known depth.

Only four specimens were identified from the sod layer of the South Block. They include two calcined Mammal Size Class V (deer-size) longbone shaft flakes, a calcined Mammal Size Class IV (otter-size) phalanx distal shaft fragment, and a calcined rockfish thoracic vertebra centrum fragment. The deer-size specimens and rockfish vertebra fragment are similar to those identified from below the sod layer in the South Block.

Another six specimens recovered from the Survivors Terrace and Midden area could not be assigned to an analytical unit. They include four calcined Mammal Size Class IV-V (otter to deer-size) fragments from unknown elements, a calcined mammal (size class unknown) fragment from an unknown element, and a calcined fish (species unknown) fragment from an unknown element.

DISCUSSION

The 49-SIT-963 faunal assemblage comes from different areas of the site with varying degrees of association with the survivors of the *Neva* shipwreck. The most secure association with the survivors comes from the North Block and the Survivors Terrace Midden and Burial. The South Block assemblage comes from a mixture of both the survivors' camp and a later mid-

nineteenth century camp. The historic context for other parts of the site is less certain, but the large faunal assemblage from the N105/E101.5 excavation area provides a noteworthy contrast.

According to an account written a few years after the event, the men who survived the *Neva* shipwreck were fortunate in being able to scavenge "a barrel of butter, some meat and some hardtack" from items washed up on shore (Berkh and Golovnin 1979:38). Because they had firearms, they could have supplemented these food supplies with resources locally available in winter. In addition, the site excavations produced evidence that they made at least one fish hook out of copper in order to catch fish. All of the faunal remains identified here from likely 1813 contexts came from species which could have been caught by the *Neva* survivors in winter.

The small North Block assemblage produced the remains of harbor seal and Sitka black-tailed deer. The larger Survivors Terrace Midden and Burial assemblages also produced the remains of deer, along with the remains of an eagle and a few salmon and lingcod remains. Sitka black-tailed deer and harbor seal would have been available and accessible near shore. During the winter when snow made browsing in the higher elevations difficult, Sitka black-tailed deer would have congregated in the lower elevations near the coast, sometimes foraging for food on the beaches (ADF&G 2016.; Moss et al. 2004:187; Tongass National Forest 2006:89). In fact, southern Kruzof Island is prime deer winter habitat today (Tongass National Forest 2006:Figure 3-24). Seals could also have been hunted from shore, where a well-hidden hunter could find them basking in the sun on rocks or sandy beaches. Tikhmenev (1878:85) describes Russians living at colonies during the 19th century in Alaska as hunting seals with firearms.

The eagle remains are interesting. First, eagles were considered edible by Russians in the early 1800s, and over 200 bald eagles reportedly were killed for their food value by the Russians during their first year at the fort in Sitka (New Archangel) (Langsdorff 1993:59). A few eagle bones were identified from early 19th century Russian contexts at the Castle Hill site in Sitka (Petruzelli 2002:202). Therefore, the *Neva* survivors could have killed an eagle for food. Second, among Russian fur traders, the double-headed eagle was a symbol of Russian authority (Foster and Henrikson 2009:2), so it is possible the eagle remains also represent a status symbol associated with the burial. Seals and buttons with the symbol of the imperial or double-headed eagle were recovered from Castle Hill site in Sitka (McMahan 2002:140, 183). The food interpretation seems more likely.

The few fish bones and shellfish specimens recovered from contexts associated with the *Neva* survivors at the site represent species which could have been caught during January. Today, lingcod spawn in winter along rocky reefs nearshore (ADF&G 2017a) and are particularly abundant around Kruzof Island (Stahl et al. 2014:2). It is possible that the few salmon or trout vertebrae recovered at the site represent winter-caught king salmon which can be found in January on the west side of Kruzof Island (ADF&G 2017b). Finally, chitons are easily found clinging to rocks in the intertidal zone.

The South Block excavation area, although a palimpsest of both 1813 contexts and later, mid-nineteenth century contexts, produced faunal remains very similar to those recovered from more secure *Neva* survivor contexts. Like the North Block assemblage, the South Block assemblage also contained the remains of harbor seal and Sitka black-tailed deer. In addition, it contained a single sea lion bone, a single salmon or trout vertebra, and two bones identified as rockfish. The single Steller sea lion phalanx fragment recovered from this assemblage is curious. Although the *Neva* survivors could have hunted sea lions, the presence of only a single small bone to represent this animal does not provide compelling evidence of hunting. The two rockfish bones could represent winter fishing by the *Neva* survivors or could be the result of the later occupation

of the site. The rockfish remains from the site appear to have come from at least one large (over 60 cm in total length) fish. Rockfish can be caught by hook and line near rocky outcrops, and the local Tlingit traditionally caught rockfish near shore during the winter, when other fresh fish were not as easily available (ADF&G 2008).

How much potential food do the faunal remains from 49-SIT-963 represent for the *Neva* survivors? To address this question, deer and seal remains are considered. Smaller than most mule deer, Sitka black-tailed deer average between 80 and 120 lbs. in the fall, and a 100-lb deer yields about 35 lbs. of usable meat (ADF&G 2016). A minimum of two deer represented at the site translates loosely into at least 70 lbs. of meat from deer. Some of the deer long bones exhibited evidence of being broken, perhaps for marrow. A right humerus shaft flake recovered from the North Block had green breakage and narrow cutmarks with no shouldering compatible with the use of metal knives (see O'Conner 2008:46). A deer-sized longbone shaft flake recovered from the South Block had possible chopmarks.

Seal remains found at the site were likely harbor seal. A subadult harbor seal averages 57 kilograms (126 lbs.) which could conceivably yield 40 kilograms (88 lbs.) of usable meat (Yesner 1988:Table 1). With winter temperatures likely in the 30s °F near the site (Tongass National Forest 2006), the high calorie content of the seal blubber would have provided a much needed energy source to supplement the relatively lean deer and seal meat (although the salvaged barrel of butter would have helped!). Seal flippers make up a large portion of the identified harbor seal remains from the site. Flippers were prized by native Tlingit as a delicacy (De Laguna 1972:396-397), and the naturalist Georg Heinrich von Langsdorff (1993:5) considered them quite tasty when the ship he was on stopped to harvest seals on St. Paul Island in 1805. Flipper elements probably are easier to identify than broken fragments of other seal bones because their structure means they are often found relatively complete (see Nagaoka et al 2008:481). Seal flippers made up a large percentage of the seal remains identified during excavations at the nineteenth century Russian colony of Fort Ross in California as well (Wake 1995:105).

The largest faunal assemblage from the site (from excavation unit N105/E101.5) comes from contexts for which the time period is unknown. Nevertheless, the species present in this excavation unit provide clues to the probable time period. This unit produced faunal remains very different from the rest of the site and is not likely to be associated with the *Neva* survivors. No deer remains were identified in this assemblage and only a handful of harbor seal bones were identified. Instead, the assemblage is dominated by sea otter, American beaver, and similarly sized remains, with a few halibut bones as well.

The presence of sea otter remains from the N105/E101.5 excavation area strongly suggests this assemblage was not produced by the *Neva* survivors, nor was it likely to have been created during the first half of the 20th century. Because Russians relied on Alaskan natives highly skilled in ocean hunting to capture sea otters for the eighteenth and nineteenth century fur trade (Gibson 1979:2), the *Neva* survivors likely would have lacked both the boats and the requisite skills to hunt sea otters on the open water. Sea otters were abundant in southeast Alaska prior to the arrival of the Russians and the start of the commercial fur trade, but overharvesting had essentially extirpated their populations in southeast Alaska by 1825 (De Laguna 1990:210). Few sea otters were seen by the early twentieth century in southeast Alaskan waters (McDonald and Cook 1907:85). To what degree sea otters were living around Kruzof Island between 1825 and 1960 is not clear, but it seems unlikely. In the mid-1960s, over 400 sea otters were re-introduced to southeast Alaska and otters thrive there today (Esslinger and Bodkin 2009:1; McDonald and Cook 2007:85). Thus, the presence of sea otter remains in this assemblage suggests it was created either before the *Neva*

shipwreck, after the shipwreck but long before the 20th century, or since the late 1960s. In addition, historically, the Tlingit hunted sea otters in the spring, summer or fall (De Laguna 1990:206; Emmons 1991:102), rather than the winter, when the *Neva* wrecked.

The beaver remains are potentially noteworthy as well. Currently, beaver can be found on Kruzof Island although it is unclear whether they existed there prior to ca. 1925 (MacDonald and Cook 1996:578, 2007:27-28). By the beginning of the twentieth century, beaver had been extirpated from several southeast Alaska islands through overtrapping. Subsequently, they were reportedly "re-introduced" to Baranof Island in 1927 and may have been "introduced" to Kruzof Island in 1925 (Burris and McKnight 1977:33; MacDonald and Cook 1996:978). Despite the claim for beaver "introduction" in 1925, it seems likely that they also existed on Kruzof Island in the nineteenth century, since they are known to have existed on both Chichagof and Baranof islands prior to overtrapping (Cook and MacDonald 2001:211). Thus it is unclear whether the beaver remains at the site indicate a post-1925 date to this assemblage, or whether they are evidence of a native Kruzof Island population prior to overtrapping. The extent to which native beaver populations from Baranof, Chichagof, and probably Kruzof Island, differed from the endemic beaver species (*Castor canadensis phaeus*) described for Admiralty Island (MacDonald and Cook 2001:209) is the type of question being researched today by biologists studying island phylogeography (see Cook et al. 2001). If the beaver bones from the site are from a native pre-twentieth century population, it is possible they could be used in future phylogenetic studies employing ancient DNA.

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NEVA Archaeological Project

SIT-963 Faunal Analysis **Excludes bone from Cat #UA2015-237-016 (10 cm BS)**

South Block

Square	Catalog #	NISP	Side	Element	Portion	Burning	Weathering	Root Etching	Breakage	Class	Taxon	Length (cm)	Age	Modification	Comments
N109/E101	UA2015-237-008	1	r	cranial	temporal	calcined	1	0	Indeterminate	Mammal	Sitka blacktail deer	2	X	0	external auditory meatus
N109/E101	UA2015-237-008	1	R	astragalus	X	calcined	1	0	Indeterminate	Mammal	Sitka blacktail deer	2	X	0	
N109/E101	UA2015-237-008	3	X	longbone	flake	calcined	2	0	Indeterminate	Mammal	Size Class 5	3	X	0	land mammal
N109/E101	UA2015-237-008	9	X	longbone	flake	calcined	2	0	Indeterminate	Mammal	Size Class 5	2	X	0	land mammal
N109/E101	UA2015-237-008	4	X	longbone	flake	calcined	2	0	Indeterminate	Mammal	Size Class 5	1	X	0	land mammal
N109/E101	UA2015-237-008	2	X	X	X	calcined	1	0	Indeterminate	Mammal	Size Class 5	3	X	0	land mammal
N109/E101	UA2015-237-008	5	X	X	X	calcined	2	0	Indeterminate	Mammal	Size Class 5	2	X	0	sea mammal or land mammal
N109/E101	UA2015-237-008	19	X	X	X	calcined	1	0	Indeterminate	Mammal	Size Class 5	1	X	0	sea mammal or land mammal
N109/E101	UA2015-237-008	3	X	X	X	calcined	1	0	Indeterminate	Mammal	Size Class 5	2	X	0	land mammal
N109/E101	UA2015-237-008	2	X	X	X	calcined	1	0	Indeterminate	Mammal	Size Class 5	1	X	0	land mammal
N109/E101	UA2015-237-008	1	X	X	X	calcined	2	0	Indeterminate	Mammal	Size Class 5	2	X	0	land mammal
N109/E101	UA2015-237-008	6	X	X	X	calcined	2	0	Indeterminate	Mammal	Size Class 5	2	X	0	land mammal
N109/E101	UA2015-237-008	4	X	X	X	calcined	2	0	Indeterminate	Mammal	Size Class 5	1	X	0	land mammal
N109/E101	UA2015-237-008	11	X	X	X	calcined	2	0	Indeterminate	Mammal	Size Class 5	2	X	0	land mammal
N109/E101	UA2015-237-008	20	X	X	X	calcined	2	0	Indeterminate	Mammal	Size Class 5	1	X	0	land mammal
N109/E101	UA2015-237-008	7	X	X	X	calcined	2	0	Indeterminate	Mammal	Size Class 5	2	X	0	land mammal
N109/E101	UA2015-237-008	6	X	X	X	calcined	2	0	Indeterminate	Mammal	Size Class 5	1	X	0	land mammal
N109/E101	UA2015-237-008	1	X	longbone	flake	calcined	1	0	Indeterminate	Mammal	Size Class 5	3	X	0	land mammal
N109/E101	UA2015-237-008	9	X	X	X	calcined	2	0	Indeterminate	Mammal	Size Class 5	2	X	0	sea mammal or land mammal
N109/E101	UA2015-237-008	2	X	X	X	calcined	2	0	Indeterminate	Mammal	Size Class 5	1	X	0	sea mammal or land mammal
N109/E101	UA2015-237-008	14	X	X	X	calcined	2	0	Indeterminate	Mammal	X	1	X	0	
N109/E101	UA2015-237-008	1	X	X	X	calcined	1	0	Indeterminate	X	X	2	X	0	
N109/E101	UA2015-237-008	1	X	X	X	calcined	1	0	Indeterminate	Fish	X	2	X	0	
N110/E101	UA2015-237-009	1	X	X	X	calcined	1	0	Indeterminate	Mammal	Size Class 5	2	X	0	sea mammal or land mammal
N109/E102	UA2015-237-010	1	X	metapodial	distal shaft	unburnt	1	0	Indeterminate	Mammal	Sitka blacktail deer	3	fused	0	in two fragments
N108/E101	UA2015-237-011	1	X	phalanx	proximal epiphysis	calcined	1	0	fusion	Mammal	harbor seal	1	unfused	0	
N108/E101	UA2015-237-011	1	X	phalanx	proximal epiphysis	stained/possible burning	1	0	Indeterminate	Mammal	harbor seal	2	X	0	Third phalanx?
N108/E101	UA2015-237-011	1	X	X	X	calcined	1	0	Indeterminate	Mammal	Size Class 5	5	X	0	land mammal
N108/E101	UA2015-237-011	1	X	longbone	flake	calcined	2	0	Indeterminate	Mammal	Size Class 5	2	X	0	land mammal
N108/E101	UA2015-237-011	2	X	X	X	calcined	1	0	Indeterminate	Mammal	Size Class 5	2	X	0	sea mammal - seal?
N108/E101	UA2015-237-011	5	X	X	X	calcined	1	0	Indeterminate	Mammal	Size Class 5	2	X	0	land mammal
N108/E101	UA2015-237-011	1	X	X	X	calcined	1	0	Indeterminate	Mammal	Size Class 5	3	X	0	land mammal
N108/E101	UA2015-237-011	6	X	X	X	calcined	1	0	Indeterminate	Mammal	Size Class 5	2	X	0	sea mammal or land mammal
N108/E101	UA2015-237-011	4	X	X	X	unburnt	1	0	Indeterminate	Mammal	Size Class 5	2	X	0	sea mammal or land mammal
N108/E101	UA2015-237-011	5	X	X	X	unburnt	1	0	Indeterminate	Mammal	Size Class 5	1	X	0	sea mammal or land mammal
N108/E101	UA2015-237-011	9	X	X	X	calcined	1	0	Indeterminate	Mammal	Size Class 5	1	X	0	sea mammal or land mammal
N108/E101	UA2015-237-011	1	A	unidentified vertebra	centrum epiphysis frag	calcined	1	0	Indeterminate	Mammal	Size Class 5	2	unfused	0	sea mammal or land mammal
N108/E101	UA2015-237-011	1	X	rib	shaft	calcined	1	0	Indeterminate	Mammal	Size Class 5	2	X	0	sea mammal or land mammal
N108/E101	UA2015-237-011	1	X	X	X	calcined	1	0	Indeterminate	Mammal	Size Class 5	2	X	unknown	possible cutmarks
N108/E101	UA2015-237-011	1	X	tooth	X	calcined	1	0	Indeterminate	Mammal	Size Class 5	1	X	0	
N108/E101	UA2015-237-011	1	X	X	X	calcined	2	0	Indeterminate	Mammal	Size Class 5	4	X	0	sea mammal or land mammal
N110/E101	UA2015-237-012	1	R	radius	distal epiphysis	calcined	2	0	Indeterminate	Mammal	Sitka blacktail deer	3	X	0	
N110/E101	UA2015-237-012	1	A	atlas vertebra	X	calcined	2	0	Indeterminate	Mammal	Sitka blacktail deer	3	fused	0	
N110/E101	UA2015-237-012	1	X	X	X	calcined	2	0	Indeterminate	Mammal	Size Class 5	2	X	0	sea mammal or land mammal
N109/E102	UA2015-237-013	1	A	caudal vertebra	centrum	calcined	1	0	Indeterminate	Fish	*Oncorhychus* sp.	1	X	0	centrum measurements: height =
N110/E101	UA2015-237-014	1	X	sesamoid	complete	calcined	1	0	complete	Mammal	Sitka blacktail deer	1	X	0	
N110/E101	UA2015-237-014	1	X	longbone	flake	calcined	2	0	Indeterminate	Mammal	Size Class 5	3	X	0	land mammal
N110/E101	UA2015-237-014	2	X	longbone	flake	calcined	2	0	Indeterminate	Mammal	Size Class 5	2	X	0	land mammal
N110/E101	UA2015-237-014	5	x	longbone	flake	calcined	2	0	Indeterminate	Mammal	Size Class 5	1	X	0	land mammal
N110/E101	UA2015-237-014	9	X	X	X	calcined	2	0	Indeterminate	Mammal	Size Class 5	2	X	0	sea mammal or land mammal
N110/E101	UA2015-237-014	10	X	X	X	calcined	2	0	Indeterminate	Mammal	Size Class 5	1	X	0	sea mammal or land mammal
N110/E101	UA2015-237-014	1	X	tooth	X	calcined	2	0	Indeterminate	Mammal	Size Class 5	2	X	0	root
N109/E101	UA2015-237-015	1	X	longbone	flake	calcined	1	0	Indeterminate	Mammal	Size Class 5	1	X	0	land mammal
N109/E101	UA2015-237-015	1	X	X	X	calcined	1	0	Indeterminate	Mammal	Size Class 5	3	X	0	land mammal
N109/E101	UA2015-237-015	5	X	X	X	calcined	1	0	Indeterminate	Mammal	Size Class 5	2	X	0	land mammal
N109/E101	UA2015-237-015	10	X	X	X	calcined	1	0	Indeterminate	Mammal	Size Class 5	1	X	0	land mammal
N109/E101	UA2015-237-015	1	A	unidentified vertebra	centrum fragment	calcined	1	0	Indeterminate	Mammal	Size Class 5	1	fused	0	sea mammal or land mammal
N108/E101	UA2015-237-017	2	X	longbone	flake	calcined	2	0	Indeterminate	Mammal	Size Class 5	2	X	0	land mammal
N108/E101	UA2015-237-017	4	X	longbone	flake	calcined	2	0	Indeterminate	Mammal	Size Class 5	1	X	0	land mammal
N108/E101	UA2015-237-017	15	X	X	X	calcined	2	0	Indeterminate	Mammal	Size Class 5	1	X	0	sea mammal or land mammal
N110/E102	UA2015-237-018	1	X	metatarsal	flake	calcined	1	0	Indeterminate	Mammal	Sitka blacktail deer	2	X	0	
N110/E102	UA2015-237-018	9	X	longbone	flake	calcined	1	0	Indeterminate	Mammal	Size Class 5	2	X	0	land mammal
N110/E102	UA2015-237-018	5	X	longbone	flake	calcined	1	0	Indeterminate	Mammal	Size Class 5	1	X	0	land mammal
N110/E102	UA2015-237-018	9	X	X	X	calcined	1	0	Indeterminate	Mammal	Size Class 5	1	X	0	land mammal
N110/E102	UA2015-237-018	3	X	X	X	calcined	1	0	Indeterminate	Mammal	Size Class 5	1	X	0	sea mammal or land mammal
N110/E102	UA2015-237-018	1	X	X	X	calcined	1	0	Indeterminate	Mammal	Size Class 5	2	X	0	land mammal
N108/E102	UA2015-237-019	1	X	sesamoid	complete	calcined	2	0	Indeterminate	Mammal	Sitka blacktail deer	2	X	0	
N108/E102	UA2015-237-019	13	X	longbone	flake	calcined	2	0	Indeterminate	Mammal	Size Class 5	2	X	0	land mammal
N108/E102	UA2015-237-019	9	X	longbone	flake	calcined	2	0	Indeterminate	Mammal	Size Class 5	1	X	0	land mammal
N108/E102	UA2015-237-019	4	X	X	X	calcined	2	0	Indeterminate	Mammal	Size Class 5	2	X	0	sea mammal or land mammal

N108/E102	UA2015-237-019	10	X	X	X	calcined	2	0	Indeterminate	Mammal	Size Class 5	2	X	0	land mammal
N108/E102	UA2015-237-019	34	X	X	X	calcined	2	0	Indeterminate	Mammal	Size Class 5	1	X	0	land mammal
N108/E102	UA2015-237-019	1	X	X	X	calcined	2	0	Indeterminate	Mammal	Size Class 5	3	X	0	land mammal
N109/E101	UA2015-237-020	1	X	longbone	flake	calcined	1	0	Indeterminate	Mammal	Size Class 5	4	X	0	land mammal
N109/E101	UA2015-237-020	4	X	longbone	flake	calcined	1	0	Indeterminate	Mammal	Size Class 5	2	X	0	land mammal
N109/E101	UA2015-237-020	2	X	X	X	calcined	2	0	Indeterminate	Mammal	Size Class 5	3	X	0	land mammal
N109/E101	UA2015-237-020	3	X	X	X	calcined	2	0	Indeterminate	Mammal	Size Class 5	2	X	0	sea mammal or land mammal
N109/E101	UA2015-237-020	2	X	X	X	calcined	2	0	Indeterminate	Mammal	Size Class 5	1	X	0	sea mammal or land mammal
N109/E101	UA2015-237-020	1	X	X	X	calcined	1	0	complete	Mammal	Size Class 5	3	fused	0	dew claw?
N108/E101	UA2015-237-021	1	X	rib	proximal shaft	calcined	2	2	Indeterminate	Mammal	Sitka blacktail deer	4	fused	0	
N108/E101	UA2015-237-021	2	X	X	X	calcined	2	0	Indeterminate	Mammal	Size Class 5	4	X	0	land mammal
N108/E101	UA2015-237-021	6	X	X	X	calcined	1	0	Indeterminate	Mammal	Size Class 5	2	X	0	sea mammal or land mammal
N108/E101	UA2015-237-021	8	X	X	X	calcined	1	0	Indeterminate	Mammal	Size Class 5	1	X	0	sea mammal or land mammal
N108/E101	UA2015-237-021	1	X	cranial	X	calcined	1	0	Indeterminate	Mammal	Size Class 5	2	X	0	sea mammal or land mammal
N108/E101	UA2015-237-021	1	X	X	X	calcined	1	0	Indeterminate	X	X	2	X	0	
N109/E101	UA2015-237-022	1	X	longbone	flake	calcined	1	0	Indeterminate	Mammal	Size Class 5	3	X	0	land mammal
N109/E101	UA2015-237-022	6	X	X	X	calcined	1	0	Indeterminate	Mammal	Size Class 5	1	X	0	land mammal
N109/E101	UA2015-237-022	2	X	X	X	calcined	1	0	Indeterminate	Mammal	Size Class 5	2	X	0	land mammal
N109/E101	UA2015-237-022	1	A	lumbar vertebra	zygopophysis	calcined	1	0	Indeterminate	Mammal	Size class 5	2	X	0	cf deer
N108/E101	UA2015-237-023	1	X	innominate	acetabulum and pubis fragment	calcined	1	0	Indeterminate	Mammal	harbor seal	2	X	0	
N108/E101	UA2015-237-023	2	A	unidentified vertebra	centrum fragment	calcined	1	0	Indeterminate	Mammal	harbor seal	2	unfused	0	
N108/E101	UA2015-237-023	1	X	first phalanx	proximal diaphysis	calcined	1	0	Indeterminate	Mammal	harbor seal	2	unfused	0	
N108/E101	UA2015-237-023	1	A	cervical vertebra	zygopophysis	calcined	2	0	Indeterminate	Mammal	harbor seal	2	X	0	
N108/E101	UA2015-237-023	1	X	first phalanx	proximal epiphysis	calcined	1	0	Indeterminate	Mammal	harbor seal	1	unfused	0	
N108/E101	UA2015-237-023	1	X	sesamoid	complete	stained/possible burning	1	0	complete	Mammal	Sitka blacktail deer	2	X	0	
N108/E101	UA2015-237-023	19	X	X	X	calcined	1	0	Indeterminate	Mammal	Size Class 5	2	X	0	sea mammal
N108/E101	UA2015-237-023	35	X	X	X	calcined	1	0	Indeterminate	Mammal	Size Class 5	1	X	0	sea mammal or land mammal
N108/E101	UA2015-237-023	1	X	X	X	calcined	1	0	Indeterminate	Mammal	Size Class 5	3	X	0	land mammal
N108/E101	UA2015-237-023	9	X	X	X	calcined	1	0	Indeterminate	Mammal	Size Class 5	2	X	0	sea mammal or land mammal
N108/E101	UA2015-237-023	7	X	X	X	calcined	1	0	Indeterminate	Mammal	Size Class 5	2	X	0	sea mammal or land mammal
N108/E101	UA2015-237-023	16	X	X	X	calcined	1	0	Indeterminate	Mammal	Size Class 5	1	X	0	sea mammal or land mammal
N108/E101	UA2015-237-023	1	A	cranial	X	calcined	1	0	Indeterminate	Mammal	Size Class 5	2	X	0	sea mammal or land mammal
N108/E101	UA2015-237-023	6	X	X	X	calcined	1	0	Indeterminate	Mammal	Size Class 5	2	X	0	sea mammal or land mammal
N108/E101	UA2015-237-023	5	X	X	X	calcined	1	0	Indeterminate	Mammal	Size Class 5	1	X	0	sea mammal or land mammal
N108/E101	UA2015-237-024	1	X	first phalanx	proximal diaphysis	calcined	1	0	Indeterminate	Mammal	harbor seal	2	unfused	0	
N108/E101	UA2015-237-024	2	A	unidentified vertebra	centrum epiphysis frag	calcined	1	0	Indeterminate	Mammal	Size Class 5	2	unfused	0	sea mammal or land mammal
N108/E101	UA2015-237-024	1	A	unidentified vertebra	centrum epiphysis frag	calcined	1	0	Indeterminate	Mammal	Size Class 5	1	unfused	0	sea mammal or land mammal
N108/E101	UA2015-237-024	1	A	lumbar vertebra	zygopophysis	calcined	1	0	Indeterminate	Mammal	Size Class 5	2	X	0	sea mammal or land mammal
N108/E101	UA2015-237-024	2	X	longbone	flake	calcined	1	0	Indeterminate	Mammal	Size Class 5	3	X	0	land mammal
N108/E101	UA2015-237-024	10	X	longbone	flake	calcined	1	0	Indeterminate	Mammal	Size Class 5	2	X	0	land mammal
N108/E101	UA2015-237-024	8	X	longbone	flake	calcined	1	0	Indeterminate	Mammal	Size Class 5	1	X	0	land mammal
N108/E101	UA2015-237-024	17	X	X	X	calcined	1	0	Indeterminate	Mammal	Size Class 5	2	X	0	sea mammal or land mammal
N108/E101	UA2015-237-024	78	X	X	X	calcined	1	0	Indeterminate	Mammal	Size Class 5	1	X	0	sea mammal or land mammal
N108/E101	UA2015-237-024	2	X	X	X	calcined	1	0	Indeterminate	Mammal	Size Class 5	3	X	0	sea mammal
N108/E101	UA2015-237-024	1	X	X	X	calcined	1	0	Indeterminate	Mammal	Size Class 5	1	X	0	sea mammal
N108/E101	UA2015-237-024	1	A	cranial	X	calcined	1	0	Indeterminate	Mammal	Size Class 5	1	X	0	sea mammal or land mammal
N108/E101	UA2015-237-024	3	X	X	X	calcined	1	0	Indeterminate	Mammal	Size Class 5	2	X	0	sea mammal or land mammal
N108/E101	UA2015-237-024	1	X	X	X	calcined	1	0	Indeterminate	Mammal	Size Class 5	1	X	0	sea mammal or land mammal
N109/E101	UA2015-237-025	1	X	metatarsal	flake	calcined	1	0	Indeterminate	Mammal	Sitka blacktail deer	2	X	0	
N109/E101	UA2015-237-025	1	X	metacarpal	shaft	calcined	2	0	Indeterminate	Mammal	Sitka blacktail deer	4	X	0	
N109/E101	UA2015-237-025	1	R	radius	distal epiphysis	calcined	2	0	recent	Mammal	Sitka blacktail deer	2	X	0	does NOT refit with right radius fr
N109/E101	UA2015-237-025	1	X	humerus	distal epiphysis	calcined	2	0	recent	Mammal	Sitka blacktail deer	2	X	0	condyle fragment
N109/E101	UA2015-237-025	1	X	longbone	flake	calcined	2	0	Indeterminate	Mammal	Size Class 5	5	X	0	land mammal
N109/E101	UA2015-237-025	1	X	longbone	flake	calcined	2	0	Indeterminate	Mammal	Size Class 5	4	X	0	land mammal
N109/E101	UA2015-237-025	2	X	longbone	flake	calcined	2	0	Indeterminate	Mammal	Size Class 5	3	X	0	land mammal
N109/E101	UA2015-237-025	12	X	longbone	flake	calcined	2	0	Indeterminate	Mammal	Size Class 5	2	X	0	land mammal
N109/E101	UA2015-237-025	1	X	rib	proximal lshaft	calcined	2	0	Indeterminate	Mammal	Size Class 5	3	fused	0	in two fragments; land mammal -
N109/E101	UA2015-237-025	1	X	X	X	calcined	2	0	Indeterminate	Mammal	Size Class 5	3	X	0	land mammal
N109/E101	UA2015-237-025	2	X	X	X	calcined	2	0	Indeterminate	Mammal	Size Class 5	2	X	0	land mammal
N109/E101	UA2015-237-025	7	X	X	X	calcined	2	0	Indeterminate	Mammal	Size Class 5	1	X	0	sea mammal or land mammal
N109/E101	UA2015-237-025	1	X	X	X	calcined	2	0	Indeterminate	Mammal	Size Class 5	2	X	0	sea mammal or land mammal
N109/E101	UA2015-237-025	1	X	X	X	calcined	2	0	Indeterminate	Mammal	Size Class 5	2	X	unknown	possible chopmarks?
N109/E101	UA2015-237-026	1	X	longbone	proximal epiphysis	calcined	1	0	Indeterminate	Mammal	harbor seal	2	unfused	0	femur or humerus head fragment
N109/E101	UA2015-237-026	1	A	unidentified vertebra	centrum fragment	calcined	1	0	Indeterminate	Mammal	harbor seal	2	unfused	0	unfused fromcentrum epiphysis
N109/E101	UA2015-237-026	1	X	second phalanx	diaphysis + distal epiphysis	calcined	1	0	fusion	Mammal	harbor seal	2	mixed fusion	0	front flipper
N109/E101	UA2015-237-026	1	A	lumbar vertebra	zygopophysis	calcined	1	0	Indeterminate	Mammal	harbor seal	2	X	0	
N109/E101	UA2015-237-026	1	X	phalanx	proximal epiphysis	calcined	1	0	Indeterminate	Mammal	harbor seal	1	unfused	0	
N109/E101	UA2015-237-026	1	A	thoracic vertebra	centrum fragment	calcined	1	0	Indeterminate	Fish	Rockfish	1	X	0	
N109/E101	UA2015-237-026	1	L	quadrate	proximal	calcined	1	0	Indeterminate	Fish	Rockfish	2	X	0	Orchard m 659.36
N109/E101	UA2015-237-026	1	X	second phalanx	distal shaft	calcined	1	0	Indeterminate	Mammal	Sea lion	2	fused	0	
N109/E101	UA2015-237-026	1	R	unciform - carpal	complete	calcined	1	0	complete	Mammal	Sitka blacktail deer	2	X	0	
N109/E101	UA2015-237-026	1	X	first phalanx	proximal shaft	calcined	2	0	Indeterminate	Mammal	Sitka blacktail deer	2	fused	0	
N109/E101	UA2015-237-026	1	X	second phalanx	distal shaft	calcined	2	0	Indeterminate	Mammal	Sitka blacktail deer	2	fused	0	
N109/E101	UA2015-237-026	1	x	sesamoid	complete	calcined	2	0	complete	Mammal	Sitka blacktail deer	1	X	0	

N109/E101	UA2015-237-026	1	X	accessory metapodial	distal shaft	calcined	1	0	Indeterminate	Mammal	Sitka blacktail deer		2	fused	0	
N109/E101	UA2015-237-026	2	X	metatarsal	flake	calcined	2	0	Indeterminate	Mammal	Sitka blacktail deer		2	X	0	
N109/E101	UA2015-237-026	1	X	third phalanx	complete	calcined	1	0	complete	Mammal	Sitka blacktail deer		2	fused	0	
N109/E101	UA2015-237-026	1	A	lumbar vertebra	zygopophysis	calcined	1	0	Indeterminate	Mammal	Sitka blacktail deer		2	X	0	
N109/E101	UA2015-237-026	1	X	first phalanx	proximal shaft	calcined	1	0	Indeterminate	Mammal	Sitka blacktail deer		2	fused	0	
N109/E101	UA2015-237-026	1	R	astragalus	X	stained/possible burning	1	0	Indeterminate	Mammal	Sitka blacktail deer		2	X	0	possible burning
N109/E101	UA2015-237-026	1	A	lumbar vertebra	centrum epiphysis frag	unburnt	1	0	Indeterminate	Mammal	Sitka blacktail deer		2	unfused	0	
N109/E101	UA2015-237-026	1	R	metacarpal	proximal shaft	calcined	1	0	Indeterminate	Mammal	Sitka blacktail deer		3	fused	butchery	in two fragments; a single cutmarl
N109/E101	UA2015-237-026	1	X	accessory first phalanx	proximal shaft	calcined	1	0	Indeterminate	Mammal	Sitka blacktail deer		1	X	butchery	2 cutmarks - metal blade
N109/E101	UA2015-237-026	6	X	longbone	flake	calcined	1	0	Indeterminate	Mammal	Size Class 5		3	X	0	land mammal
N109/E101	UA2015-237-026	22	x	longbone	flake	calcined	2	0	Indeterminate	Mammal	Size Class 5		2	X	0	land mammal
N109/E101	UA2015-237-026	15	X	longbone	flake	calcined	1	0	Indeterminate	Mammal	Size Class 5		1	X	0	land mammal
N109/E101	UA2015-237-026	29	X	X	X	calcined	2	0	Indeterminate	Mammal	Size Class 5		2	X	0	sea mammal or land mammal
N109/E101	UA2015-237-026	83	X	X	X	calcined	2	0	Indeterminate	Mammal	Size Class 5		1	X	0	sea mammal or land mammal
N109/E101	UA2015-237-026	1	X	longbone	flake	calcined	1	0	Indeterminate	Mammal	Size Class 5		4	X	butchery	land mammal; single cutmark - m
N109/E101	UA2015-237-026	1	A	unidentified vertebra	centrum fragment	calcined	1	0	Indeterminate	Mammal	Size Class 5		2	fused	0	sea mammal or land mammal
N109/E101	UA2015-237-026	1	X	X	X	unburnt	1	0	Indeterminate	Mammal	Size Class 5		3	X	0	sea mammal or land mammal
N109/E101	UA2015-237-026	2	X	X	X	unburnt	1	0	Indeterminate	Mammal	Size Class 5		2	X	0	sea mammal or land mammal
N109/E101	UA2015-237-026	3	X	X	X	calcined	1	0	Indeterminate	Mammal	Size Class 5		1	X	0	sea mammal or land mammal
N109/E101	UA2015-237-026	2	X	X	X	unburnt	1	0	Indeterminate	Mammal	Size Class 5		1	X	0	sea mammal or land mammal
N109/E101	UA2015-237-026	1	X	X	X	calcined	1	0	Indeterminate	Mammal	Size Class 5		2	X	0	sea mammal or land mammal
N109/E101	UA2015-237-026	1	X	X	X	unburnt	1	0	Indeterminate	Mammal	Size Class 5		2	X	0	sea mammal or land mammal
N109/E101	UA2015-237-026	2	X	X	X	unburnt	1	0	Indeterminate	Mammal	Size Class 5		3	X	0	sea mammal or land mammal
N109/E101	UA2015-237-026	53	X	X	X	calcined	1	0	Indeterminate	Mammal	Size Class 5		2	X	0	sea mammal or land mammal
N109/E101	UA2015-237-026	1	A	unidentified vertebra	centrum fragment	calcined	1	0	Indeterminate	Fish	X		1	X	0	
N109/E101	UA2015-237-026	1	X	X	X	calcined	1	0	Indeterminate	Fish	X		2	X	0	
N109/E101	UA2015-237-026	1	X	X	X	calcined	2	0	Indeterminate	X	X		1	X	0	
N109/E101	UA2015-237-026	1	A	unidentified vertebra	centrum fragment	calcined	1	0	Indeterminate	Fish	X		1	X	0	
N109/E101	UA2015-237-026	1	X	X	X	calcined	1	0	Indeterminate	X	X		2	X	0	
N109/E101	UA2015-237-027	1	X	X	X	unburnt	1	0	Indeterminate	Mammal	Size Class 6+	>10		X	0	in 13 fragments
	TOTAL:	**906**														
Bone from Sod Layer (0-10 cm BS)																
N110/E101	UA2015-237-016	1	A	thoracic vertebra	centrum fragment	calcined	1	0	Indeterminate	Fish	Rockfish		2	X	0	centrum measurements: height =
N110/E101	UA2015-237-016	1	X	phalanx	distal shaft	calcined	1	0	Indeterminate	Mammal	Size Class 4		1	fused	0	cf dog
N110/E101	UA2015-237-016	2	X	longbone	shaft	calcined	1	0	Indeterminate	Mammal	Size Class 5		2	X	0	
	Total:	**4**														