Gunflints in Southeastern North America:
A Preliminary Study

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Contents

Introduction

Gunflints are useful items for archaeological study because they are made of stone Gunflint assemblages from an archaeological site are an indicator of the weapons arsenal at that site. Gunflints also indicate relative access to goods. The level of access to imported goods such as gunflints at sites of various ethnicities and political ranking sometimes deviates from what is expected. This study focuses on gunflints from the eighteenth century in the Southeastern U.S. Particular attention was paid to the scholarship of Hamilton (1980), Hamilton and Fry (1975), Hamilton and Emery (1988), Kent (1983), and Kenmotsu (1990). Excellent recent scholarship on gunflints by Ballin (2012) is acknowledged.

This monograph is an expansion of a 1992 pilot study and 1992 and 2009 professional paper presentations by the author (Elliott 1992, 2009a). This study focused on aspects of gunflints, where gunflints are viewed as indirect indicators of weapons arsenals. By comparing weaponry over a variety of sites in one specific geographic region, some interesting patterns appear. This study uses gunflint widths and associated weaponry as indicators of site chronology, geography, function, and ethnicity.

The initial study began with fewer than 70 gunflints from two sites that were excavated by the author in Georgia, Ebenezer (9EF28) and Mount Pleasant (9EF169), but Elliott's study quickly snowballed. Other early sites in the Savannah River watershed were added to the dataset. This was followed by the gathering of data from other sites in southeastern North America.

The data on these gunflints is highly variable and gunflint width data was not available for all, however, and the study focused on a sample of 652 flints from a selection of more than 27 sites in the Southeast. The sites selected were based largely on the availability of data, but also reflected a variety of ethnic groups, urban settlement types, and geographic settings. Gunflints are considered from 13 sites in Georgia, four sites in South Carolina, two sites in Alabama, Two sites in Texas and one site each in Mississippi and Tennessee. Within the southeastern region, sites with sizeable samples of gunflints with quantitative measures for individual specimens were examined. These represent a variety of sites from diverse environments.

The Georgia sites include:

- Fort Argyle (1734-1758),
- Fort Hawkins (1809-1821),
- Fort Morris/Sunbury (1758-1830),
- Fort Mount Pleasant (Yuchi Town) (1719-1758),
- Fort St. Andrews (1736-1742),
- Frederica (1736-1783),
- New Ebenezer (1736-1820),
- Okfuskenena (Burnt Village) (ca. 1717-1793),

- Ossabaw Island, North End Plantation (1760-1840),
- Sansavilla Bluff (1734-1790),
- Savannah (1779-1782),
- Tybee Lighthouse
- Ochillee Creek (1790-1825) and
- Upatoi Town (9ME394, 9ME395 and 9ME472) (ca. 1790-1825).

The four sites in South Carolina are:

- Fort Moore (1715-1766),
- New Windsor (1737-1840),
- Savanno Town (1680-1719) and
- Daniels Island.

The two sites in Alabama are Old Mobile and Yuchi Town. Two sites in Texas included Gilbert and Pearson. The site in Mississippi is the Chickasaw town of Ackia. The site in Tennessee is the Upper Cherokee town of Mialoquo.

Flintlock weapon types and gunflint correlates, based on width dimension limits defined by Hamilton and Emery (1988). These limits are dictated by the width of the gun hardware. Weapon categories and their gunflint width ranges are: pistols, trade guns, carbines, fowlers, muskets, rifles, blunderbusses, wall guns and cannons.

Archaeologists recognized the research value of gunflints as early as the late nineteenth century and studies appeared sporadically throughout the early and middle twentieth century (Evans 1887; Clark 1935; Dolomieu 1960; Emery 1979, 1986; Hamilton 1960; Woodward 1960; Witthoft 1966; Hanson and Hsu 1970; Stone 1970, 1974; White 1975; Miller and Keeler 1978; de Lothbiniere 1977, 1980; Baird 1981; Quinn 2004). Early descriptions of gunflint manufacturing techniques provide an interesting backdrop for this study (Skertchly 1984; Smith 1960).

Gunflints, or the flint used to make a spark in flintlock weaponry, are nearly ubiquitous on eighteenth century sites. Whether European colonial or Native American, they represent a common denominator for comparison of material culture between ethnically diverse groups. Because they are made from stone they are amenable to sourcing techniques and allow the archaeologist to measure their spatial distributions relative to a specific source. Unlike pottery or beads, gunflints were often modified by the user and this use-wear evidence contains embedded clues about their role in the economic system. Finding the best way to measure tool exhaustion in gunflints is a problem that has yet to be solved--a problem compounded by the fact that there were different sized gunflints for different sized guns. In looking at the assemblages however, one gets a gut feeling that some assemblages are more exhausted than others.

Gunflints also are interesting because they are chipped stone tools and they represent an ethno-historic link with stone-age societies. Laws that pertain to prehistoric chipped stone assemblages may also be relevant to gunflints, and in turn, continued study of gunflints

may provide a better understanding of chipped stone tools.

At one level gunflints were a minor and inexpensive accoutrement for use with firearms. Trade records among eighteenth century traders suggest that flints had very little value compared with other trade goods, yet they were an essential ingredient in the deerskin trade and in warfare. Williams posed an analogy between gunflints in eighteenth century life with the paper book matches were free with a pack of cigarettes in vending machines. In certain situations, however, a good gunflint probably made the difference between life and death. It has been estimated that a fresh gunflint was exchanged for every 20 shots of the weapon. If so, then a very large number of gunflints were consumed during the eighteenth century, probably in much greater frequencies than is reflected on archaeological sites. Consequently, we can surmise that differential discard is a significant variable for gunflints. Many gunflints undoubtedly were discarded while in the field. Unlike other groups, Native Americans often included gunflints in burials. Europeans, on the other hand, were fond of storing large quantities of gunflints in area that were subject to explosions, such as powder magazines.

Research Methods

Raw materials were grouped into three broad categories--English (gray or black chert), French (brown and honey colored chert), or Local (various types of North American chert not always well described). This was based on macroscopic identification and is probably the variable most subject to error in this study. Manufacture technique included--blade, spall, or bifacially-worked flints. The Blade category was limited to French flints, while the prismatic British blade gunflints, which appear at the very end of the eighteenth century, were excluded from the study. Spall-type flints were usually English, although a few French spall-types were recognized. The bifacially-worked flints were mostly associated with what is presumably North American chert.

This study examines distributional data for six variables-- gunflint width (edge to edge), length (heel to blade), surface area (length x width), length to width ratio, manufacture style (spall, blade, or bifacial), and raw material type. These attributes are used to address two primary questions. First, is a gunflint assemblage an accurate reflection of the weapons arsenal for any given site? Second, what ethnic differences be identified by comparing gunflint assemblages from different sites?

The 1992 study of gunflints in the southeastern United States was premised on Thomas Hamilton and Thomas Emery's seminal research (Hamilton and Emery 1988; Elliott 1992). Hamilton stated that the width of the gunflint, or that measurement perpendicular to the long axis of the gun barrel, was quite specific to the type of weapon with which it was used. The gunflint could be no wider than that allowed by the gun hardware, and, although these flintlock weapons were hand-made, by the eighteenth century, some degree of standardization in sizes had been achieved. This was particularly true among military issue weapons. Hamilton and Emery cite a French gunflint contract from 1740 that specified sizes for flints--the only such document from the period. It is not known, however, how closely gunflint manufacturers adhered to these standards. At least six French musket flints from Frederica, for example, exceeded the size specifications.
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Hamilton and Emery (1988) presented these width ranges for gunflints:

- Pistols, or small tradeguns-- flints <20 mm
- Tradeguns-- -flints from 20-28 mm
- Carbines, or fowlers-- flints from 28-34 mm
- Military muskets-- flints >34 mm

If Hamilton and Emery's size gradations are valid divisions, then a gunflint assemblage grouped by gunflint width should reflect the types of weapons that were present. A military site, for example, would likely contain a higher percentage of flints used with muskets, while a Native American village site would have high frequencies of flints used with tradeguns. Urban sites could be expected to have an assortment of gunflints reflecting the diversity of activities and peoples that frequented there.

It should be pointed out that Hamilton and Emery's gunflint size classification omits any discussion of gunflints used in rifles, wall guns, or blunderbusses. All three of these weapon groups were used in the colonial southeast and each has been documented archaeologically in colonial Georgia. Nevertheless, Hamilton's scheme is a useful tool for sorting gunflints into meaningful groups.

Elliott surmised that if Hamilton and Emery's gunflint size gradations are valid divisions, then an assemblage grouped by gunflint width should reflect the types of weapons that were present on any given site. Elliott proceeded to search the literature and gather measurements for gunflints from a wide assortment of archaeological sites. In many cases, gunflint width was actually longer than the length. Width were measured to the nearest tenth of a millimeter

Results

Gunflint data from 27 archaeological sites in southeastern North America were compiled for this study. Table 1 contains a summary of the gunflints examined for this study. Results from each site is described below. Metric data for individual specimens from the study is provided in Appendix I.

Table 1. Gunflint Summary.

Sample	Site	Pistol		Tradegun		Tradegun/Carbine		Carbine		Musket		TOTAL
		Count	%	Count	%	Count	%	Count	%	Count	%	Count
1	Frederica	1	0.8	25	19.2	1	0.8	59	45.4	44	33.8	130
2	Ft. Hawkins	14	28.0	29	58.0	0	0.0	7	14.0	0	0.0	50
3	Okfuskenena	1	2.7	31	83.8	0	0.0	4	10.8	1	2.7	37
4	Ft. St. Andrews	0	0.0	9	25.0	1	2.8	20	55.6	6	16.7	36
5	Mt. Pleasant	0	0.0	23	67.6	4	11.8	6	17.6	1	2.9	34
6	New Ebenezer	1	3.0	19	57.6	2	6.1	8	24.2	3	9.1	33
7	Ft. Argyle	8	27.6	13	44.8	1	3.4	6	20.7	1	3.4	29
8	Ft. Morris	0	0.0	9	33.3	0	0.0	13	48.1	5	18.5	27
9	Sansavilla Bluff	0	0.0	4	21.1	3	15.8	12	63.2	0	0.0	19
10	Ossabaw, N. End	0	0.0	4	57.1	0	0.0	3	42.9	0	0.0	7
11	Buzzard Roost	0	0.0	2	50.0	0	0.0	2	50.0	0	0.0	4
12	Savannah	0	0.0	0	0.0	0	0.0	2	66.7	1	33.3	3
13	Tybee Island	0	0.0	0	0.0	0	0.0	2	100.0	0	0.0	2
14	9CE379	2	100.0	0	0.0	0	0.0	0	0.0	0	0.0	2
15	Savano Town	1	5.3	8	42.1	2	10.5	7	36.8	1	5.3	19
16	Ft. Moore	0	0.0	10	62.5	1	6.3	5	31.3	0	0.0	16
17	New Windsor	2	7.1	15	53.6	4	14.3	7	25.0	0	0.0	28
18	Daniels Island	0	0.0	31	64.6	0	0.0	16	33.3	1	2.1	48
19	Yuchi Town	5	23.8	14	66.7	0	0.0	2	9.5	0	0.0	21
20	Old Mobile	1	2.9	18	52.9	0	0.0	14	41.2	1	2.9	34
21	Mialoqua	2	10.5	11	57.9	1	5.3	5	26.3	0	0.0	19
22	Gilbert	1	5.9	14	82.4	2	11.8	0	0.0	0	0.0	17
23	Pearson	0	0.0	4	80.0	0	0.0	1	20.0	0	0.0	5
24	Ackia	1	5.6	14	77.8	0	0.0	3	16.7	0	0.0	18
25	9ME394	3	50.0	3	50.0	0	0.0	0	0.0	0	0.0	6
26	9ME395	1	16.7	5	83.3	0	0.0	0	0.0	0	0.0	6
27	9ME472	1	50.0	1	50.0	0	0.0	0	0.0	0	0.0	2
	TOTAL	**45**	**6.9**	**316**	**48.5**	**22**	**3.4**	**203**	**31.1**	**65**	**10.0**	**652**

NEW EBENEZER (SAMPLE 6)

Proceeding upriver from the Atlantic Ocean the eighteenth-century sites on the Savannah River in this study include New Ebenezer, Mount Pleasant, New Windsor, Fort Moore, and Savano Town (Mouzon 1775). The gunflints from Ebenezer, 33 in number, and Mount Pleasant, 34 of them, were derived from controlled excavations by the LAMAR Institute (Elliott 1991; Elliott and Elliott 1992). Gunflints from New Windsor, Fort

Moore and Savano Town were in private collections.

New Ebenezer (1736-1820) was a town on the Savannah River about 40 miles from the Atlantic Ocean. It was populated by German speaking Lutherans and lasted from 1736 until approximately 1800. The town has domestic as well as military areas, but excavations thus far have focused on the domestic area. Most of the gunflints from New Ebenezer came from a cellar associated with a blacksmith, locksmith, and gunflint manufacturer and are tightly dated from the period 1750 through 1753. Others date to the American Revolution when Americans and British jockeyed for control of the town (Elliott and Elliott 1992; Elliott 2003b).

Thirty-three gunflints excavated at Ebenezer were included in the dataset. Under Hamilton's gunflint width scheme, New Ebenezer contained:

- 1 Pistol
- 19 Tradeguns
- 8 Carbines
- 2 Tradegun/Carbines
- 3 Muskets

Tradegun flints were most common and comprised 57.6 percent of the assemblage. The Ebenezer gunflints averaged 26.4 mm in width; 19.4 mm in length, 520.2 mm^2 surface area, and L/W ratio, 0.8. The assemblage includes 21 spall, nine blade and three bifacial type flints.

MOUNT PLEASANT (SAMPLE 5)

Mount Pleasant (9EF169) was a Yuchi Indian town approximately 15 miles upstream from Ebenezer (Elliott 1991). It was settled by Yuchi following the Yamasee War around 1720, but by the 1740s the Yuchi had largely abandoned the site and it was used as a base for British traders and, later as a military garrison lasting until 1758 when it was completely abandoned. The area where the gunflints were excavated contains all three components, and it was not possible to completely isolate them. Thus, the Mount Pleasant sample is bracketed between 1720 and 1758.

Thirty-four gunflints excavated from Mount Pleasant are included in the dataset. Based on the gunflints, Based on width, the Mount Pleasant assemblage contained:

- 23 Tradeguns
- 6 Carbines
- 4 Tradegun/Carbines
- 1 Musket

Tradegun flints were the most common and comprise 67.6 percent of the assemblage. The Mount Pleasant gunflints averaged 26.4 mm in width; 20.7 mm in length, 553.6 mm^2

surface area, and L/W ratio, 0.8. The assemblage includes 31 spall and three blade type flints.

SAVANO TOWN (SAMPLE 15)

The three sites in Aiken County, South Carolina, Fort Moore (1715-1766), Savano Town (1680-1719), and New Windsor (1737-1840), are located along the Savannah River. New Windsor town was a community settled in the late 1730s by Swiss and other German speakers. The gunflints from New Windsor, Fort Moore, and Savano Town that were measured, 63 in all, have only a surface provenience from private collections. Since this study began, the Savannah Archaeological Research Project (SRARP) and the Beech Island Historical Society have undertaken excavations at New Windsor and Fort Moore. Although excavations were conducted by William Edwards and the University of South Carolina at Fort Moore in the 1960s, this work is poorly reported and we obtained no information on gunflints from their excavations.

Savano Town was located in present-day Aiken County, South Carolina opposite from Augusta. Savano Town was a Native American settlement whose inhabitants have not been established concretely, but may include Shawnee or Savannah. The Savano, whoever they were, were displaced from the site prior to the establishment of Fort Moore. Both Savano Town and Fort Moore predate the 1733 establishment of Georgia.

Elliott examined a surface collection from the presumed site of Savano Town made by Jackie and Bennie Bartley (Jackie Bartley personal communication, June 1990). Based on width, the Bartley's Savano Town gunflint assemblage consisted of 19 gunflints. Savano Town contained:

- 1 Pistol
- 8 Tradeguns
- 2 Tradegun/Carbines
- 7 Carbines
- 1 Musket

Tradegun flints were the most common and comprised 42.1 percent of the assemblage.The Savano Town gunflints averaged 27.1 mm in width; 22.7 mm in length, 630.5 mm^2 surface area, and L/W ratio, 0.8. All of the Savano Town gunflints were spall type.

FORT MOORE (SAMPLE 16)

Fort Moore was located in present-day Aiken County, South Carolina opposite from Augusta. Fort Moore was a British military garrison established around 1715 and abandoned by 1765. The archaeological site of Fort Moore was excavated in the 1960s by the University of South Carolina. Reporting of their efforts, however, is nearly lacking. The private collection of Harold Maness, which was obtained from the Fort Moore site

was examined for this study (Maness 1986). Manness' Based on width, the Fort Moore sample contained 16 gunflints. Based on width, these include:

10 Tradeguns,
5 Carbines
1 Tradegun/Carbine

Tradegun flints were most common and comprised 62.5 percent of the assemblage. The Fort Moore gunflints averaged 26.8 mm in width; 21.7 mm in length, 583.5 mm^2surface area, and L/W ratio, 0.8. The assemblage included 12 spall, three blade and one bifacial type flint.

NEW WINDSOR (SAMPLE 17)

New Windsor town was a community settled by Swiss and other German speakers. New Windsor consisted of a town and outlying township composed of plantations. New Windsor was a farming village, non-military in character, that was populated by Swiss and Germans beginning in 1737. The abandonment date of New Windsor is not readily known, but the settlement was absorbed by Augusta on the Georgia side of the river prior to the American Revolution. The present study collection of Jackie and Bennie Bartley, was based on a private surface collection from the site. Based on width, the Bartley's New Windsor sample contained 28 gunflints representing:

- 2 Pistols
- 15 Tradeguns
- 4 Tradegun/Carbines
- 7 Carbines

Tradegun flints were most common and comprise 53.6 percent of the assemblage. The New Windsor gunflints averaged 25.8 mm in width; 21.5 mm in length, 559.9 mm^2 surface area, and L/W ratio, 0.8. The assemblage included 26 spall, one blade and one bifacial type flint.

FORT ARGYLE (SAMPLE 7)

Three military sites included in this study share a common thread. Each contained early Georgia Ranger forts. These sites are Sansavilla Bluff (1734-1796), Fort Argyle (1734-1758), and Fort Mount Pleasant (1719-1758). Rangers from South Carolina occupied Fort Argyle from 1734-1739. In 1739, the Georgia Rangers were formed by General Oglethorpe. Georgia Ranger companies were posted at Sansavilla Bluff, Fort Argyle and Mount Pleasant. By 1758 all three of these ranger outposts were abandoned.

Braley (1985) first identified the archaeological site of Fort Argyle. More extensive excavation was reported by Elliott (1997).

Twenty-nine gunflints excavated from Fort Argyle are included in the dataset. Based on width, these include:

- 8 Pistol
- 13 Tradegun
- 1 Tradegun/Carbine
- 6 Carbine
- 1 Musket

Tradegun flints were the most common and comprised 44.8 percent of the assemblage. The Fort Argyle gunflints averaged 24 mm in width; 20.39 mm in length, 512.9 mm^2 surface area, and L/W ratio, 0.9. The assemblage includes 22 spall, six unspecified and one blade type flint.

SANSAVILLA BLUFF (SAMPLE 9)

Fort Mount Venture was a Georgia Ranger fort that was established at Sansavilla Bluff on the Altamaha River in present-day Wayne County, Georgia. The fort was attacked and burned in 1742. Later in the eighteenth century Sansavilla Bluff was home to Captain Alleck, who was a Cusseta Chief. Sansavilla Bluff continued to have a military presence in the American Revolution and in the 1790s. During the Georgia-Creek War, a company of the Glynn County Dragoons was posted at Sansavilla Bluff (Elliott 2005a).

Nineteen gunflints from Sansavilla Bluff are included in the dataset. Seven flints were recovered by recent archaeological excavations (Elliott 2005a). The others were from two private collections. The flints in private ownership were collected after Midgette's unreported excavations in the 1960s. Based on width, these include:

4 Tradegons
3 Tradegun/Carbines
12 Carbines

Carbine flints were the most common and comprised 63.2 percent of the assemblage. The Sansavilla Bluff gunflints averaged 29.2 mm in width; 23.5 mm in length, 688.5 mm^2 surface area, and L/W ratio, 0.8. The assemblage includes 18 spall and one blade type flint.

FORT ST. ANDREWS (SAMPLE 4)

Fort St. Andrews (1736-1742) was a short-lived British Army fort on the northern part of Cumberland Island. Until 2005 archaeologists and historians had declared, incorrectly, that Fort St. Andrews was gone. Recent survey, excavations and surface collections at Site 9CM113 provide preliminary gunflint data for this military outpost (Rock and Elliott 2007). Gunflints that were collected by an island resident from the surface of the beach

directly below Fort St. Andrews also are included in the database. Gunflints from two later seasons of NPS fieldwork are not included. Based on width, the Fort St. Andrews gunflint assemblage includes:

- 9 Tradeguns
- 1 Tradegun/Carbines
- 20 Carbines
- 6 Muskets

The Fort St. Andrews gunflints averaged 30.5 mm in width; 28 mm in length, 872.4 $mm^{2,}$ surface area, and L/W ratio, 0.9. All of the gunflints were spall type.

FREDERICA (SAMPLE 1)

Fort Frederica (1736-1783) on St. Simons Island was an important British town and military garrison on the southern frontier of Georgia. Fort Frederica was a fortified town. Fort Frederica was an important British town and military garrison on the southern frontier of Georgia from the 1730s to the 1750s. As the name implies, Frederica was small town surrounded by fortifications. Frederica was established in 1736 three years before war was declared between the young colony of Georgia and the Spanish Empire. To the chagrin of the Spanish government, these defenses were never tested and the underdogs at Frederica fended off the threat of invasion. Archaeological excavations were undertaken at Frederica in the 1940s and continued sporadically until the early 1980s (Honerkamp 1980). Despite the extent of the archaeological excavations at Frederica, few detailed excavation reports were generated by this work and fewer still were published.

The Frederica sample consisted of 130 gunflints, which represents the largest sample from a single site in this study. Large collections at the Southeastern Archaeological Center, Tallahassee, Florida and from archaeologist Joel Shiner's Trench, which was a trench that was excavated immediately east of Frederica and was used to stash "deaccessioned" artifacts from Frederica's excavations in the 1960s (Honerkamp 1998). Shiner's trench, which stands as a shining example of how not to curate artifact collections, has been the subject of recent remedial study by the Glynn County School System and the National Park Service. Additional gunflints from Shiner's Trench were analyzed at the Archaeology Laboratory at Oglethorpe Elementary School, St. Simons Island, Georgia. Other gunflint collections from Frederica, such as those used in a gunflint study by Thomas Hamilton and Thomas Emery, and other excavated assemblages curated at the Florida Museum of History were not examined in the present study.

The Frederica gunflints represented the following hypothetical weapons arsenal, based on gunflint width ranges for specific weapon types, as defined by Hamilton and Emery (1988):

- 1 Pistols
- 25 Tradeguns
- 1 Tradegun/Carbines
- 59 Carbines
- 44 Muskets

The Frederica gunflints averaged 31.4 mm in width; 24.7 mm in length, 792.2 mm^2surface area, and L/W ratio, 0.8.

The Frederica gunflints, which were of three types: blade, blade/spall, and spall, were present in the following frequencies: 83 spall, 45 blade, and two blade/spall types. The preponderance of spall type gunflints at Frederica is not surprising, since it was a British town and, prior to the 1780s, the secrets of blade gunflint technology were carefully guarded by the French, who were specialists in their manufacture. Consequently, all but one of the blade type gunflints from Frederica were manufactured from French flints. After the American Revolution, the British acquired the secret and British gunflints from the 1790s to the 1840s are predominantly of the blade type. These are easily distinguished from French blade flints because they are made from gray English flints rather than the honey-colored French flints. Since Frederica was an inconsequential place by 1790, the dearth of English blade flints at Frederica is expected.

The local production of gunflints made from ship's ballast has been documented at Frederica by Hamilton and Emery (1988). This activity was evidenced by chipping debitage and aborted, unfinished flints. Similar production strategies have been documented at the colonial town of New Ebenezer, where it was associated with a gunsmith's shop. Locally made flints at New Ebenezer were of the spall type. Gunflint manufacture also was observed on a lesser scale at Fort Argyle, a South Carolina and Georgia Ranger fort on the Ogeechee River. Local gunflint manufacture also is reported from the seventeenth century French Fort Pentagoet in the Northeast (Faulkner and Faulkner 1987).

The study of gunflints at Frederica may be further confounded by a catastrophic event that took place there. Possibly as a result of Spanish sabotage, the powder magazine at Frederica exploded in 1744 and this event was recorded in the documentary record. Undoubtedly, this explosion altered the distribution and state of archaeological preservation of the gunflints at Frederica. Presumably, any gunflints that were scattered about the town as a result of this explosion were virgin flints. This may account, in part, for the high frequency of flints intended for use with military muskets.

FORT MORRIS (SAMPLE 8)

Fort Morris (1776-1782) was a Continental Army fort on the Sunbury River. It was situated immediately south of the town of Sunbury. It was attacked by Loyalists on January 9, 1779, who captured and then occupied the fort. The one-day bombardment left a mess, which included gunflints and other weaponry.

Archaeological study of Fort Morris yielded an abundant Revolutionary War artifact assemblage (Elliott 2003a). Archaeological excavations at Fort Morris yielded 27 gunflints that were included in the dataset. Based on width, these include:

- 9 Tradeguns
- 13 Carbines
- 5 Muskets

The Fort Morris gunflints averaged 30 mm in width; 25 mm in length, 763.5 mm^2 surface area, and L/W ratio, 0.8. The assemblage includes 18 spall and nine blade type flints.

FORT HAWKINS (SAMPLE 2)

Fort Hawkins (1806-1821) was a U.S. Army fort and Federal Indian trade factory on the Ocmulgee River in central Georgia. Through its gates passed most of the military stores for the southern region. The fort was never attacked and it served as a headquarters complex. The soldiers at Fort Hawkins were regular Army, riflemen, and artillerymen.

Archaeologists conducted extensive excavations at Fort Hawkins from 2005 to 2012 (Elliott 2007b, 2009b; Elliott et al. 2013). Fifty gunflints excavated from Fort Hawkins were included in this dataset. These included 47 blade types, two spall types and one spall/blade type. Based on gunflint width, the Fort Hawkins sample included:

- 14 Pistols
- 29 Tradeguns
- 7 Carbines

The Fort Hawkins gunflints averaged 22.2 mm in width; 22.1 mm in length, 601.8 mm^2surface area, and L/W ratio, 1.0. The assemblage includes 47 blade, two spall and one spall/blade type flint.

OSSABAW ISLAND, NORTH END PLANTATION (SAMPLE 10)

Archaeological excavations at the North End Plantation on Ossabaw Island produced seven gunflints that were included in the dataset (Elliott 2005b, 2007a). This plantation began in 1760 and lasted until the Civil War. These include four tradegun and three carbine flints. The Ossabaw Island gunflints averaged 26.6 mm in width; 22.1 mm in length, 598.3 mm^2surface area, and L/W ratio, 0.8. The assemblage includes four spall and three blade type flints.

SAVANNAH (SAMPLE 12)

Savannah, Georgia was the scene of a major Revolutionary War battle in late 1779. Archaeologists have located portions of the battlefield (R. Elliott and Elliott 2009; R. Elliott 2011). Three gunflints recovered from Revolutionary War contexts at Savannah were included in the dataset. The flints came from excavations at Madison Square and the Spring Hill Redoubt. These include: two carbine flints from Madison Square and one musket flint from Spring Hill Redoubt. The Savannah gunflints averaged 33 mm in width; 25.7 mm in length, 858.3 mm^2surface area, and L/W ratio, 0.8. The assemblage includes two spall and one blade type flint.

TYBEE ISLAND (SAMPLE 13)

Tybee Island is a barrier island at the mouth of the Savannah River in Chatham County, Georgia. Test excavations beneath the Assistant Lightkeeper's House at the north end of Tybee Island yielded two carbine gunflints that were included in the dataset (Elliott 2005c). The Tybee Island gunflints averaged 29.1 mm in width; 25.1 mm in length, 732.1 mm^2surface area, and L/W ratio, 0.9. The assemblage includes one spall and one blade type flint.

OKFUSKENENA (SAMPLE 3)

Native American sites in western Georgia and Eastern Alabama seem to share common gunflint characteristics. The largest sample comes from Okfuskenena (Burnt Village) (ca. 1717-1793) on the Chattahoochee River, where archaeologists excavated 43 gunflints. This town was burned in 1793, effectively providing a solid end date for its gunflint assemblage (Huscher and Williams 1972).

Collections from the excavations at Okfuskenena are curated at the University of Georgia. Elliott collected metric data on 37 gunflints from Okfuskenena for this study. Based on width, these include:

- 1 Pistol
- 31 Tradeguns
- 4 Carbines
- 1 Musket

Tradeguns comprise 83.8 percent of the assemblage, which is the highest percentage of all 27 study sites. The Okfuskenena gunflints averaged 25.9 mm in width; 20.6 mm in length, 541.5 mm^2 surface area, and L/W ratio, 0.8. The assemblage includes 30 spall and seven blade type flints.

9ME394 (SAMPLE 25)

Upatoi Town (ca. 1790-1825) was an upland settlement consisting of dozens of scattered farmsteads (Elliott et al. 1998). Excavations at the Lower Creek town of Upatoi in the central Chattahoochee River watershed yielded modest gunflint assemblages from three sites (9ME372, 9ME394 and 9ME395) located in Upatoi. Six gunflints excavated from 9ME394 were included in this study. These include three pistol and three tradegun flints. These gunflints averaged 21.3 mm in width; 19.6 mm in length, 424.7 mm^2 surface area, and L/W ratio, 0.9. The assemblage includes three spall and three blade type flints.

9ME395 (SAMPLE 26)

Site 9ME395 was a Lower Creek settlement on Upatoi Creek in present-day Muscogee County, Georgia (Elliott et al. 1998). Six gunflints excavated from 9ME395 were included in this study. These include one pistol and five tradegun flints. These gunflints averaged 25.9 mm in width; 20.6 mm in length, 541.5 mm^2 surface area, and L/W ratio, 0.8. These gunflints averaged 21.8 mm in width; 17.6 mm in length, 387.3 mm^2 surface area, and L/W ratio, 0.8. The assemblage includes four blade and two spall type flints.

9ME472 (SAMPLE 27)

Site 9ME472 was a Lower Creek settlement on Upatoi Creek in present-day Muscogee County, Georgia (Elliott et al. 1998). Two gunflints excavated from 9ME472 were included in this study. These include one pistol and one tradegun flint. These gunflints averaged 21.2 mm in width; 19.7 mm in length, 437.8 mm^2 surface area, and L/W ratio, 1.1. The assemblage includes one blade and one spall/blade type flint.

9CE379 (SAMPLE 14)

Site 9CE379 was a Lower Creek settlement located on Ochillee Creek in present-day Chattahoochee County, Georgia (Cowie 2001). Two pistol gunflints excavated from 9CE379 were included in this study. These gunflints averaged 14.6 mm in width; 15.4 mm in length, 224.2 mm^2 surface area, and L/W ratio, 1.1. Both flints were blade type.

BUZZARD ROOST (SAMPLE 11)

Buzzard Roost was a Lower Creek settlement located on the Flint River in present-day Taylor County, Georgia. Four gunflints excavated from Buzzard Roost Sites in Taylor County, Georgia were included in this study (Ledbetter et al 2002:200-201). These include two tradegun and two carbine flints. The Buzzard Roost gunflints averaged 28 mm in width, 25.8 mm in length, 719.8 mm^2surface area, and L/W ratio, 0.9. All flints were spall type.

DANIELS ISLAND, SOUTH CAROLINA (SAMPLE 18)

Daniels Island is located on the Cooper River in Berkeley County, South Carolina. Archaeological excavations on Daniels Island explored an eighteenth century British colonial plantation (Zierden et al. 1987). Forty-eight gunflints recovered from Daniels Island were included in this study. Based on width, these include:

- 31 Tradeguns
- 15 Carbines
- 1 Musket

The Daniels Island gunflints averaged 26.7 mm in width; 21.8 mm in length, 586.6 mm^2 surface area, and L/W ratio, 0.8. The assemblage includes 35 spall and 13 blade type flints.

YUCHI TOWN, ALABAMA (SAMPLE 19)

Yuchi Town was a large town occupied by the Yuchi tribe located on the Chattahoochee River in present-day Russell County, Alabama. Twenty-one gunflints recovered from Yuchi Town (1RU63), which were located during recent studies by Hargrave and his colleagues (1998) and Weisman (2000:151-155), were included in this study. Based on width, these include:

- 5 Pistols
- 14 Tradeguns
- 2 Carbines

The Yuchi Town gunflints averaged 23.1 mm in width; 21.7 mm in length, 503 mm^2 surface area, and L/W ratio, 1.0. The assemblage includes 16 spall, three blade, one bifacial and one undetermined type flint.

OLD MOBILE, ALABAMA (SAMPLE 20)

The first French colonial fortified town site of La Mobile, Alabama was discovered and explored by archaeologist Gregory Waselkov (2005). This town was occupied from 1702 until 1712. Thirty-four gunflints recovered from Old Mobile were included in this study. Based on width, these include:

- 1 Pistol
- 18 Tradeguns
- 14 Carbines
- 1 Musket

The Old Mobile gunflints averaged 27.5 mm in width; 21.8 mm in length, 607 mm^2 surface area, and L/W ratio, 0.8. All the gunflints were spall type.

ACKIA, MISSISSIPPI (SAMPLE 24)

Ackia was a historic Chickasaw village near Tupelo, Mississippi. It was the scene of battle with French in 1736. Portions of Ackia were excavated during a study of the Natchez Trace by National Park Service archaeologists in the late 1930s and early 1940s (Jennings 1941, 1944:409-414; 1994; Cotter 1949; U.S. National Park Service 1939). Elliott examined a collection of 18 gunflints attributed to Ackia that were housed at the Southeastern Archeological Center, Tallahassee, Florida. Based on width, these include:

- 1 Pistol
- 14 Tradeguns
- 3 Carbines

The Ackia gunflints averaged 25.9 mm in width; 21.4 mm in length, 561.7 mm^2 surface area, and L/W ratio, 0.8. The assemblage includes 13 spall type, four bifacial, and one spall/bifacial type flint.

GILBERT SITE, TEXAS (SAMPLE 22)

The Gilbert site is a historic Native American village site located in Rains County, Texas (Jelks 1967; Bell 2016). Archaeological study at the Gilbert site has yielded evidence of French trade with local Native Americans in the mid-eighteenth century.

Elliott collected data from a sample of 17 gunflints excavated from the Gilbert site from a small collection housed at the Southeastern Archeological Center, Tallahassee, Florida. Based on width, these include:

- 1 Pistol
- 14 Tradeguns
- 2 Tradegun/Carbines

Tradeguns comprise 82.4 percent of the assemblage, which is the third highest of all 27 study sites. The Gilbert gunflints averaged 23.2 mm in width; 19.6 mm in length, 454.9 mm^2 surface area, and L/W ratio, 0.9. The assemblage includes 14 bifacial and three blade type flints.

PEARSON SITE, TEXAS (SAMPLE 23)

The Pearson Site is a historic Indian site in Rains County, Texas (Duffield and Jelks 1961). Elliott collected data on five gunflints excavated from the Pearson Site for this study. These include four tradegun and one carbine flint. The Pearson gunflints averaged 24.2 mm in width; 21.8 mm in length, 533.4 mm^2 surface area, and L/W ratio, 0.9. The assemblage includes three bifacial and two spall type flints.

MIALOQUA, TENNESSEE (SAMPLE 21)

Mialoqua was an eighteenth-century Overhill Cherokee town on the Little Tennessee River in Tennessee. Excavations were conducted at Mialoqua for the Tennessee Valley Authority in the late 1970s (Russ and Chapman 1984). Data on 19 gunflints was taken from the archaeological report. Based on width, these include:

- 2 Pistols
- 11 Tradeguns
- 1 Tradegun/Carbine
- 5 Carbines

The Mialoqua gunflints averaged 23.2 mm in width; 19.6 mm in length, 454.9 mm^2 surface area, and L/W ratio, 0.9. The assemblage includes 17 spall and two blade type flints.

Interpretations

GUNFLINT DIMENSION ANALYSIS

Obtaining statistically valid sample sizes of gunflints is important. This study presents data on 652 gunflints from 27 archaeological sites in eastern North America. To recover a sizeable sample of flints generally requires extensive fieldwork. Several of the sites in this study were extensively excavated, yet the sample of flints is meager. Other parts of the data set are based on surface collections gathered under less optimal scientific conditions. The dataset includes Indian towns, Euro-American towns, fortifications, farmsteads, and one plantation. Cherokee village sites are not represented in this study. This is not because they are not important but is a result of the lack of available gunflint data.

The is study followed the premise, derived from Hamilton and Emery's (1988) gunflint width dimension scheme, that the flintlock weapon hardware dictates how wide a gunflint can be. Of course, one can insert a smaller flint than a weapon can accommodate, but that likely leads to a higher misfire rate. Misfires can be deadly, especially in human combat, or if one is facing a wounded bear, for example.

The average gunflint width from the study was 27.2 mm. Savannah had the highest average width (33 mm), although the sample size is very small. Frederica had the second highest average width (31.4 mm). At the lower end of the spectrum are the Native American Upatoi sites with widths of 14.6-21.8 mm.

The average gunflint length from the study was 22.5 mm. The average surface area for gunflints from the study was 627.3 mm^2. The average L/W ratio for the study was 0.8.

Muskets

These were flints greater than 34 mm wide. A total of 65 flints in the study were classified as Musket flints. These weapons comprised 10 percent of the southeastern assemblage. Fort Frederica had the most and the highest relative percentage of musket flints with 33.8 percent. Sites with more than 10 percent musket flints included Fort Frederica, Savannah, Fort Morris and Fort St. Andrews. Sixteen sites had no musket flints.

The high frequency of musket flints to other types at Frederica is a good indicator of the significant British Army force that was in residence. The absence of musket flints at Fort Argyle, a site that was exclusively military, may reflect the different weapons that were used by a Ranger troop. While muskets may have been suitable for traditional British warfare tactics when armies were pitted against armies on an open plain, the wooded conditions and guerrilla tactics of the frontier may have rendered muskets at a disadvantage with smaller, more maneuverable weapons. Muskets were military issue, but the gunflint data suggests that all military units did not have muskets.

Carbines

These were flints greater than 28 mm and less than 34 mm wide. A total of 204 carbine flints were identified in the study. These weapons comprised 31 percent of the overall project sample. The Carbine flint sample averaged 30.8 mm in width, 24.5 mm in length, 755.6 mm^2 surface area, and L/W ratio of 0.8.

Sites with greater than 75 percent carbine flints include only Tybee Island. Sites with 50-75 percent carbine flints include Savannah, Sansavilla Bluff, Ft. St. Andrews and Buzzard Roost. Sites with less than 25 percent carbine flints include New Ebenezer, Ft. Argyle, Pearson, Mt. Pleasant, Ackia, Ft. Hawkins, Okfuskenana, Yuchi Town, 9ME395, Gilbert, 9ME394, 9ME472 and 9CE379.

Tradeguns/Carbines

This category contains flints that measured 28.0 mm in width. They may be associated with either tradeguns or carbines. A total of 22 flints fall into this category. This represents three percent of the study sample. The Tradegun/Carbine flint sample averaged 21.7 mm in length, 606.2 mm^2 surface area, and L/W ratio of 0.8.

Sites with greater than 75 percent tradegun flints include Okfuskenena, 9ME395, Gilbert, Pearson, and Ackia. Sites with less than 25 percent tradegun flints include Sansavilla Bluff, Frederica, 9CE379, Savannah and Tybee Island.

Tradeguns

These are represented by flints 28 mm or less wide. A total of 316 flints fall into this category. These weapons comprised 48.5 percent of the project total. The Tradegun flints averaged 24.5 mm in width, 20.9 mm in length, 513 mm^2 surface area, and L/W ratio of 0.9.

Three aboriginal sites, including Okfuskenena, 9ME395 and Gilbert contained more than 80 percent tradegun flints. Frederica had a relatively low frequency of tradegun flints (19.2%), while the Savannah River sites had more substantial amounts: Mount Pleasant (67.6%), Ft. Moore (62.5%), New Ebenezer (57.6%) and New Windsor (53.6%), and Savano Town (42.1%).

Pistols

Pistol flints were the least common weapon flint, comprising 6.9 percent of the composite gunflint assemblages (N=45). These averaged 17.2 mm in width, 17.9 mm in length, 309.7 mm^2 surface area, and L/W ratio of 1.0.

Fort Hawkins had the most (N=14) and the highest frequency (28%) of pistol flints. Fort Argyle had the next highest count (N=8) and the highest percentage of pistol flints (27.6%). Fort Frederica had only one percent pistol flints. Nine sites in the study had no pistol flints, which further attests to their rarity. The Upatoi sites had the highest relative percentage of pistol flints (43.8%). The Upatoi sites contained no carbine or musket flints.

DIACHRONIC CHANGE IN GUNFLINTS

The Georgia gunflints exhibit significant differences when viewed over time. The study sites were placed into two categories—Early, or Revolutionary War or earlier, and Late, or post-Revolutionary War. Muskets decrease over time. Pistols increase over time. Or, gunflints tend to get smaller over time.

The use of gunflints spans a period of more than 150 years, so this artifact class offers opportunities to study diachronic change. Gunflint technology changed over time. Flintlock technology replaced matchlocks by the end of the 17th century. Spalls were replaced by blades by the 1780s. Percussion cap technology leads to the end of flintlocks by the mid-1800s. While some flintlocks were still in use by Georgians in the Civil War, most were phased out by the 1840s.

SPATIAL CHANGE IN GUNFLINTS

The Georgia gunflints exhibit significant differences when viewed geographically. The data were grouped into two categories-coastal and interior sites. Muskets were more common along the Georgia coast than in the interior. Tradeguns were more common in the interior.

Distance from raw material sources and production sites influences gunflint types. Expense in acquisition plays a role in presence/absence, and value placed on “exotic” flints. Access to ship ballast, which often included European flint cobbles, led to gunflint knapping workshops at several coastal, or near coastal sites. Native Americans applied their bifacial technology to the challenge of securing flints by making gunflints from North American chert, as evidenced at Mount Pleasant. In some situations, where no flints were available, olive green bottle glass was modified to serve this purpose. Glass gunflints, which are another paper topic in their own right, were recorded on both Euro-American and Native American sites in Georgia.

DIFFERENCES RESULTING FROM SITE FUNCTION

The Georgia gunflints exhibit significant differences when grouped by site function. The sites were grouped into military or domestic sites. Military sites contain a higher percentage of muskets. Domestic sites have more pistols. Social factors determine

weapons availability, which in turn is reflected by the gunflints discarded. Sites with military garrisons have prescribed arsenals. Some sites, such as Fort Argyle, may have had special weapons, such as carbines, because they were better suited for traveling through thick woods. Civilians likely had more consumer choices than soldiers.

GUNFLINTS AND ETHNICITY

Archaeologists have identified four morphological classes of gunflints in British North America based on manufacture technology: spall and blade (most of which were manufactured in Europe), bifacial (of Native American manufacture made from local and European ballast flint), and the chip gunflint (used during the period 1580 to 1650). The spall category includes those made from English and French flint, while the blade types, prior to the 1790s, were made exclusively from French flints. The English spall and the French blade gunflint were both in use by the mid-1600s and probably continue through the American Revolution. The latter type chip gunflint is not reported in the Southeastern literature and is not discussed further in this study.

Kent's (1983) study of gunflints demonstrated the trend towards increasing amounts of French flints on North American sites during the eighteenth century. The present study adds additional data and reexamines this trend using our gunflint sample. This slight increase generally supports Kent's statements, although the percentages for individual sites may vary, as at Frederica for example. The data does not indicate, however, as some have suggested, that French flints completely replaced spall types during the Revolution and post war period.

Most scholars, gun enthusiasts, and eighteenth century re-enactors agree that French blade-style flints were superior to the English spall-type flints. Hamilton and Emery (1988) demonstrated the superior firing capability when using French versus English flints. A preference for French flints also is documented in contemporary accounts by military men of the eighteenth century. Throughout most of the eighteenth century the French were at odds militarily with the British and this served to restrict the availability of French gunflints in the British colonies.

Gunflints in this study were classified into three types: blade, spall and bifacial. Measurement criteria included length, width and thickness, measured to the nearest tenth of a millimeter. Classified by suspected place of origin: French, English, local North American chert, indeterminate, and green bottle glass. Lesser known European flint sources, which were mined in the 18th and early 19th centuries include Albania, Portugal and Spain.

A total of 162 flints were produced as blades. This comprises 25 percent of the project sample. These averaged 26.4 mm in width, 22.1 mm in length, 600 mm^2 surface area and L/W ratio of 0.9. The blade gunflint sample includes 81 tradeguns, 28 muskets, 30 carbines, two tradegun/carbines, and 21 pistol.

A total of 451 flints were produced as spalls. This comprises 69 percent of the project

sample. These averaged 27.7 mm in width, 22.9 mm in length, 476.1 mm^2 surface area and L/W ratio of 0.9. The spall gunflint sample includes 207 tradeguns, 170 carbines, 36 muskets, 18 tradegun/carbines, and 20 pistols.

A total of 27 flints were produced by bifacial knapping. This comprises four percent of the project sample. These averaged 23.8 mm in width, 20 mm in length, 647 mm^2 surface area and L/W ratio of 0.8. The bifacial gunflint sample includes 20 tradeguns, two carbines, two tradegun/carbines, three pistols, and no muskets.

Bifacial gunflints were present on Native American and European sites, but those on aboriginal sites tended to be slightly narrower.

Table 2. Gunflints by Manufacture Type.

Weapon	Blade		Spall		Bifacial		Other		TOTAL
Type	Count	%	Count	%	Count	%	Count	%	
Pistol	21	13	20	4	3	11	1	8	
Tradegun	81	50	207	46	20	74	8	67	
Tradegun/Carbine	2	1	18	4	2	7	0	0	
Carbine	30	19	170	38	2	7	2	17	
Musket	28	17	36	8	0	0	1	8	
TOTAL	**162**	**25**	**451**	**69**	**27**	**4**	**12**	**2**	**652**

English gunflints dominate the gunflint assemblages in Georgia. French flints are second-most common. Gunflints made from ship ballast, mostly Dover flint from England, have been documented at Frederica and New Ebenezer, and this behavior was likely repeated at other coastal settlements. Glass gunflints have been recognized at several sites in Georgia including Upatoi Town, Okfuskenena Town, and Fort Argyle.

The Georgia gunflints exhibit significant differences when grouped by gross ethnic categories. Euro-American and Native American gunflint groups were compared. Euro-American sites have more muskets. Native American sites have more pistols. Presumably Euro-Americans had more choices in weaponry than did Native Americans. Native Americans' arsenals were affected by trader's inventories and enemy conquest. Other factors, such as differential discard, catastrophic dispersal, mortuary practices, or intentional caching may contribute to the gunflint patterning. The context of the gunflint assemblages is important to their interpretation. Surface collections are useful, but carefully excavated data is preferred. Large samples are required for statistical validity and this usually translates to large excavations. Sometimes even large excavations result in low gunflint yields.

The lower frequency of tradeguns and higher frequency of muskets suggests that Frederica's role was military with little interchange with the Native Americans. Conversely, the Savannah River towns have a mixed weapon assemblage with a reduced emphasis on military weapons.

Conclusions

This study focused on only a few aspects of gunflints, preferred to study gunflints as indirect indicators of weapons arsenals and to compare patterns of weaponry over a variety of sites in one specific geographic region. We did not delve deeply into the subject of gunflint manufacturing history, flint sourcing, experimental archaeology, ignition technology, or use-wear analysis. These are all worthwhile pursuits and we encourage a variety of scholarly topics on gunflints.

Gunflints are a paradox. They are a chipped stone tool, harkening back to the European Neolithic, quarried and knapped by skilled specialists. They are also vestiges of an early military industrial complex, state of the art military technology in the 18th and early 19th centuries. Trained as a prehistorian, I was lured to study gunflints because they represent an artifact that spans two worlds. As stone tools their attributes can be measured and their distributions in relation to quarry sources can be mapped. Because they are made from stone they are amenable to sourcing techniques and allow the archaeologist to measure their spatial distributions relative to a specific source. As consumer goods and products of a military complex, they offer clues about access to goods in various geographic regions and among divergent social groups. Gunflints, or the flint used to make a spark in flintlock weaponry, are ubiquitous on eighteenth century sites. Whether European colonial or Native American, they represent a common denominator for comparison of material culture between ethnically diverse groups.

Do gunflint assemblages, when width measurements are taken, reflect the weapons arsenal on a site? The answer is probably. Is there an absolute correspondence between gunflint width parameters and weapon type? The answer is probably not. More gunflint measurements are needed from a variety of military and domestic sites may enable archaeologists to identify statistically significant trends. Some of these trends are suggested by this study.

The high frequency of musket flints to other types at Frederica is a solid indicator of the significant British Army force that was in residence. The absence of musket flints at Fort Argyle, a site that was exclusively military, stands in stark contrast to the Frederica assemblage and may reflect the different weapons (possibly carbines) that were used by the Ranger troop garrisoned there. While muskets may have been suitable for traditional British warfare tactics when armies were pitted against armies on an open plain, the wooded conditions and guerrilla tactics of the frontier, may have rendered muskets at a disadvantage versus smaller, more maneuverable weapons.

Several important lessons were learned from this academic exercise. First, and most easily remedied, the recordation of gunflint attributes is inconsistent in the literature, and generally inadequate for regional, continental, or global comparisons. But this need not be so. To perform meaningful statistical manipulations with gunflints, one needs measurements of individual gunflints rather than ranges or averages. When one averages a sample, gunflints intended for different weapons are lumped together. One is faced with the question of what to record, where do you draw the line. At a minimum, length and

width should be itemized. Kenmotsu (1990) provides an example of a gunflint analysis form. Now that the chronology and typology of gunflints is relatively well outlined, researchers should turn to studying spatial distributions, the economics of gunflints, and questions of cultural process that can be addressed using gunflints.

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Appendix I.

Gunflint Inventory

Appendix 1. Gunflint Inventory.

Sample	Site	Type	Length	Width	Weapon	Surf. Area	L/W ratio	Comments
1	Frederica	Spall	18.3	19.9	Pistol	364.2	0.9	
1	Frederica	Spall	24.2	20.7	Tradegun	500.9	1.2	
1	Frederica	Spall	20.4	23.1	Tradegun	471.2	0.9	
1	Frederica	Spall	22.9	24.2	Tradegun	554.2	0.9	
1	Frederica	Spall	21.1	24.9	Tradegun	525.4	0.8	
1	Frederica	Spall	21.5	25	Tradegun	537.5	0.9	
1	Frederica	Spall	23.0	25.5	Tradegun	586.5	0.9	
1	Frederica	Spall	19.8	25.6	Tradegun	506.9	0.8	
1	Frederica	Spall	21.3	25.6	Tradegun	545.3	0.8	
1	Frederica	Spall	17.7	25.7	Tradegun	454.9	0.7	
1	Frederica	Spall	24.2	25.7	Tradegun	621.9	0.9	
1	Frederica	Spall	21.3	26.2	Tradegun	558.1	0.8	
1	Frederica	Spall	29.6	26.4	Tradegun	781.4	1.1	
1	Frederica	Spall	23.9	26.5	Tradegun	633.4	0.9	
1	Frederica	Spall	22.7	26.6	Tradegun	603.8	0.9	
1	Frederica	Spall	18.7	26.8	Tradegun	501.2	0.7	
1	Frederica	Spall	27.1	27.1	Tradegun	734.4	1.0	
1	Frederica	Spall	24.8	27.2	Tradegun	674.6	0.9	
1	Frederica	Spall	18.4	27.5	Tradegun	506.0	0.7	
1	Frederica	Spall	21.7	27.7	Tradegun	601.1	0.8	
1	Frederica	Spall	20.0	27.9	Tradegun	558.0	0.7	
1	Frederica	Spall	26.8	27.9	Tradegun	747.7	1.0	
1	Frederica	Spall	19.6	28.0	Tradegun/Carbine	548.8	0.7	
1	Frederica	Spall	20.6	28.1	Carbine	578.9	0.7	
1	Frederica	Spall	20.9	28.1	Carbine	587.3	0.7	
1	Frederica	Spall	27.9	28.7	Carbine	800.7	1.0	
1	Frederica	Spall	25.2	28.9	Carbine	728.3	0.9	
1	Frederica	Spall	25.3	28.9	Carbine	731.2	0.9	
1	Frederica	Spall	25.8	28.9	Carbine	745.6	0.9	
1	Frederica	Spall	19.3	29.1	Carbine	561.6	0.7	
1	Frederica	Spall	27.8	29.1	Carbine	809.0	1.0	
1	Frederica	Spall	21.0	29.6	Carbine	621.6	0.7	
1	Frederica	Spall	18.8	29.7	Carbine	558.4	0.6	
1	Frederica	Spall	21.3	29.8	Carbine	634.7	0.7	
1	Frederica	Spall	22.4	30	Carbine	672.0	0.7	
1	Frederica	Spall	23.0	30.2	Carbine	694.6	0.8	
1	Frederica	Spall	29.9	30.3	Carbine	906.0	1.0	
1	Frederica	Spall	20.3	30.5	Carbine	619.2	0.7	
1	Frederica	Spall	26.6	30.5	Carbine	811.3	0.9	
1	Frederica	Spall	27.0	30.5	Carbine	823.5	0.9	
1	Frederica	Spall	20.7	30.6	Carbine	633.4	0.7	
1	Frederica	Spall	19.0	30.7	Carbine	583.3	0.6	
1	Frederica	Spall	23.6	30.7	Carbine	724.5	0.8	
1	Frederica	Spall	24.6	30.7	Carbine	755.2	0.8	
1	Frederica	Spall	26.7	31	Carbine	827.7	0.9	
1	Frederica	Spall	27.0	31.0	Carbine	837.0	0.9	
1	Frederica	Spall	31.0	31.0	Carbine	961.0	1.0	
1	Frederica	Spall	21.3	31.1	Carbine	662.4	0.7	
1	Frederica	Spall	21.3	31.7	Carbine	675.2	0.7	
1	Frederica	Spall	25.2	31.7	Carbine	798.8	0.8	
1	Frederica	Spall	25.7	32.0	Carbine	822.4	0.8	
1	Frederica	Spall	26.6	32.0	Carbine	851.2	0.8	
1	Frederica	Spall	18.5	32.1	Carbine	593.9	0.6	
1	Frederica	Spall	24.2	32.1	Carbine	776.8	0.8	
1	Frederica	Spall	26.7	32.7	Carbine	873.1	0.8	
1	Frederica	Spall	24.9	32.8	Carbine	816.7	0.8	

Appendix 1. Gunflint Inventory.

Sample	Site	Type	Length	Width	Weapon	Surf. Area	L/W ratio	Comments
1	Frederica	Spall	25.8	32.8	Carbine	846.2	0.8	
1	Frederica	Spall	26.5	32.8	Carbine	869.2	0.8	
1	Frederica	Spall	22.2	32.9	Carbine	730.4	0.7	
1	Frederica	Spall	25.3	33.1	Carbine	837.4	0.8	
1	Frederica	Spall	26.0	33.1	Carbine	860.6	0.8	
1	Frederica	Spall	26.7	33.5	Carbine	894.5	0.8	
1	Frederica	Spall	36.0	33.5	Carbine	1206.0	1.1	
1	Frederica	Spall	24.8	33.7	Carbine	835.8	0.7	
1	Frederica	Spall	28.6	33.7	Carbine	963.8	0.8	
1	Frederica	Spall	22.2	34	Carbine	754.8	0.7	
1	Frederica	Spall	24.3	34.1	Musket	828.6	0.7	
1	Frederica	Spall	27.1	34.2	Musket	926.8	0.8	
1	Frederica	Spall	25.2	34.3	Musket	864.4	0.7	
1	Frederica	Spall	27.6	34.4	Musket	949.4	0.8	
1	Frederica	Spall	30	34.7	Musket	1041.0	0.9	
1	Frederica	Spall	26.0	34.8	Musket	904.8	0.7	
1	Frederica	Spall	24.3	35.0	Musket	850.5	0.7	
1	Frederica	Spall	30.2	35.0	Musket	1057.0	0.9	
1	Frederica	Spall	30.8	35.0	Musket	1078.0	0.9	
1	Frederica	Spall	29.8	35.1	Musket	1046.0	0.8	
1	Frederica	Spall	24.0	35.2	Musket	844.8	0.7	
1	Frederica	Spall	34	35.7	Musket	1213.8	1.0	
1	Frederica	Spall	28.7	35.9	Musket	1030.3	0.8	
1	Frederica	Spall	24.4	36.1	Musket	880.8	0.7	
1	Frederica	Spall	26.6	36.3	Musket	965.6	0.7	
1	Frederica	Spall	32.2	38.0	Musket	1223.6	0.8	
1	Frederica	Spall	38.0	41.9	Musket	1592.2	0.9	
1	Frederica	Blade	19.3	25.7	Tradegun	496.0	0.8	
1	Frederica	Blade	20.1	26	Tradegun	522.6	0.8	
1	Frederica	Blade	20.3	27.3	Tradegun	554.2	0.7	
1	Frederica	Blade	27.1	27.7	Tradegun	750.7	1.0	
1	Frederica	Blade	31	28.2	Carbine	874.2	1.1	
1	Frederica	Blade	23.0	29.2	Carbine	671.6	0.8	
1	Frederica	Blade	21.3	29.4	Carbine	626.2	0.7	
1	Frederica	Blade	24.8	30.0	Carbine	744.0	0.8	
1	Frederica	Blade	22.6	30.6	Carbine	691.6	0.7	
1	Frederica	Blade	20.0	30.9	Carbine	618.0	0.6	
1	Frederica	Blade	25.8	31.8	Carbine	820.4	0.8	
1	Frederica	Blade	25.3	32.0	Carbine	809.6	0.8	
1	Frederica	Blade	26.5	32	Carbine	848.0	0.8	
1	Frederica	Blade	26.0	33.1	Carbine	860.6	0.8	
1	Frederica	Blade	23.5	33.2	Carbine	780.2	0.7	
1	Frederica	Blade	26.6	33.2	Carbine	883.1	0.8	
1	Frederica	Blade	24.8	33.8	Carbine	838.2	0.7	
1	Frederica	Blade	31.9	33.9	Carbine	1081.4	0.9	
1	Frederica	Blade	22.2	34.0	Carbine	754.8	0.7	
1	Frederica	Blade	19.5	34.1	Musket	665.0	0.6	
1	Frederica	Blade	25.5	34.2	Musket	872.1	0.7	
1	Frederica	Blade	24.5	34.3	Musket	840.4	0.7	
1	Frederica	Blade	25.5	34.3	Musket	874.7	0.7	
1	Frederica	Blade	23.7	34.4	Musket	815.3	0.7	
1	Frederica	Blade	27.8	34.4	Musket	956.3	0.8	
1	Frederica	Blade	23.5	34.6	Musket	813.1	0.7	
1	Frederica	Blade	24.3	34.6	Musket	840.8	0.7	
1	Frederica	Blade	23.5	34.7	Musket	815.5	0.7	
1	Frederica	Blade	28.2	34.7	Musket	978.5	0.8	

Appendix 1. Gunflint Inventory.

Sample	Site	Type	Length	Width	Weapon	Surf. Area	L/W ratio	Comments
1	Frederica	Blade	27.2	34.8	Musket	946.6	0.8	
1	Frederica	Blade	25.3	35.2	Musket	890.6	0.7	
1	Frederica	Blade	27.7	35.2	Musket	975.0	0.8	
1	Frederica	Blade	20.9	35.5	Musket	742.0	0.6	
1	Frederica	Blade	26.7	35.6	Musket	950.5	0.8	
1	Frederica	Blade	25.6	35.7	Musket	913.9	0.7	
1	Frederica	Blade	27.6	35.7	Musket	985.3	0.8	
1	Frederica	Blade	26.8	35.9	Musket	962.1	0.7	
1	Frederica	Blade	24.2	36.0	Musket	871.2	0.7	
1	Frederica	Blade	28.2	36.0	Musket	1015.2	0.8	
1	Frederica	Blade	27.5	36.2	Musket	995.5	0.8	
1	Frederica	Blade	25.0	36.5	Musket	912.5	0.7	
1	Frederica	Blade	32.2	37.1	Musket	1194.6	0.9	
1	Frederica	Blade	23.2	37.6	Musket	872.3	0.6	
1	Frederica	Blade	30.3	39.2	Musket	1187.8	0.8	
1	Frederica	Blade	29.6	41.2	Musket	1219.5	0.7	
1	Frederica	Blade/spall	23.7	32.5	Carbine	770.3	0.7	
1	Frederica	Blade/spall	30.3	37.6	Musket	1139.3	0.8	
2	Fort Hawkins	Blade	32.4	28.6	Carbine	926.6	1.1	
2	Fort Hawkins	Blade	29.0	29.0	Carbine	841.0	1.0	
2	Fort Hawkins	Blade	24.0	29.5	Carbine	708.0	0.8	
2	Fort Hawkins	Blade	30.3	30.3	Carbine	918.1	1.0	
2	Fort Hawkins	Blade	24.8	32.4	Carbine	803.5	0.8	
2	Fort Hawkins	Blade	15.5	11.5	Pistol	178.3	1.3	
2	Fort Hawkins	Blade	15.0	13.0	Pistol	195.0	1.2	
2	Fort Hawkins	Blade	15.2	15.3	Pistol	232.6	1.0	
2	Fort Hawkins	Blade	18.0	14.3	Pistol	257.4	1.3	
2	Fort Hawkins	Blade	17.0	15.7	Pistol	266.9	1.1	
2	Fort Hawkins	Blade	17.2	16.6	Pistol	285.5	1.0	
2	Fort Hawkins	Blade	17.0	18.0	Pistol	306.0	0.9	
2	Fort Hawkins	Blade	16.7	19.0	Pistol	317.3	0.9	
2	Fort Hawkins	Blade	20.2	16.3	Pistol	329.3	1.2	
2	Fort Hawkins	Blade	19.3	19.1	Pistol	368.6	1.0	
2	Fort Hawkins	Blade	21.8	17.5	Pistol	381.5	1.2	
2	Fort Hawkins	Blade	21.6	19.1	Pistol	412.6	1.1	
2	Fort Hawkins	Blade	23.0	18.0	Pistol	414.0	1.3	
2	Fort Hawkins	Blade	24.2	17.3	Pistol	418.7	1.4	
2	Fort Hawkins	Blade	23.5	20.0	Tradegun	470.0	1.2	
2	Fort Hawkins	Blade	18.4	20.0	Tradegun	368.0	0.9	
2	Fort Hawkins	Blade	21.5	20.0	Tradegun	430.0	1.1	
2	Fort Hawkins	Blade	20.3	20.0	Tradegun	406.0	1.0	
2	Fort Hawkins	Blade	23.0	21.0	Tradegun	483.0	1.1	
2	Fort Hawkins	Blade	20.0	21.0	Tradegun	420.0	1.0	
2	Fort Hawkins	Blade	23.5	21.1	Tradegun	495.9	1.1	
2	Fort Hawkins	Blade	27.0	21.3	Tradegun	575.1	1.3	
2	Fort Hawkins	Blade	26.0	21.5	Tradegun	559.0	1.2	
2	Fort Hawkins	Blade	19.4	22.0	Tradegun	426.8	0.9	
2	Fort Hawkins	Blade	21.5	22.0	Tradegun	473.0	1.0	
2	Fort Hawkins	Blade	22.2	22.2	Tradegun	492.8	1.0	
2	Fort Hawkins	Blade	25.5	22.5	Tradegun	573.8	1.1	
2	Fort Hawkins	Blade	21.6	22.7	Tradegun	490.3	1.0	
2	Fort Hawkins	Blade	17.0	23.2	Tradegun	394.4	0.7	
2	Fort Hawkins	Blade	24.0	23.2	Tradegun	556.8	1.0	
2	Fort Hawkins	Blade	23.3	23.3	Tradegun	542.9	1.0	
2	Fort Hawkins	Blade	16.1	23.4	Tradegun	376.7	0.7	
2	Fort Hawkins	Blade	22.8	23.5	Tradegun	535.8	1.0	

Appendix 1. Gunflint Inventory.

Sample	Site	Type	Length	Width	Weapon	Surf. Area	L/W ratio	Comments
2	Fort Hawkins	Blade	15.2	23.7	Tradegun	360.2	0.6	
2	Fort Hawkins	Blade	28.0	24.0	Tradegun	672.0	1.2	
2	Fort Hawkins	Blade	22.4	24.1	Tradegun	539.8	0.9	
2	Fort Hawkins	Blade	26.7	25.2	Tradegun	672.8	1.1	
2	Fort Hawkins	Blade	26.4	25.4	Tradegun	670.6	1.0	
2	Fort Hawkins	Blade	27.5	25.5	Tradegun	701.3	1.1	
2	Fort Hawkins	Blade	21.7	25.6	Tradegun	555.5	0.8	
2	Fort Hawkins	Blade	25.0	26.3	Tradegun	657.5	1.0	
2	Fort Hawkins	Blade	28.0	26.7	Tradegun	747.6	1.0	
2	Fort Hawkins	Spall	27.3	30.3	Carbine	827.2	0.9	
2	Fort Hawkins	Spall	17.0	32.4	Carbine	550.8	0.5	
2	Fort Hawkins	Spall/Blade	21.0	24.0	Tradegun	504.0	0.9	
3	Okfuskenena	Blade	19.2	21.5	Tradegun	412.8	0.9	
3	Okfuskenena	Blade	16.0	23.3	Tradegun	372.8	0.7	
3	Okfuskenena	Blade	17.0	24.5	Tradegun	416.5	0.7	
3	Okfuskenena	Blade	19.3	25.3	Tradegun	488.3	0.8	
3	Okfuskenena	Blade	21.6	25.5	Tradegun	550.8	0.8	
3	Okfuskenena	Blade	18.8	27.3	Tradegun	513.2	0.7	
3	Okfuskenena	Blade	22.6	27.3	Tradegun	617.0	0.8	
3	Okfuskenena	Spall	20.6	29.9	Carbine	615.9	0.7	
3	Okfuskenena	Spall	27.2	31.2	Carbine	848.6	0.9	
3	Okfuskenena	Spall	28.7	32.0	Carbine	918.4	0.9	
3	Okfuskenena	Spall	20.0	32.1	Carbine	642.0	0.6	
3	Okfuskenena	Spall	30.7	35.6	Musket	1092.9	0.9	
3	Okfuskenena	Spall	19.7	19.4	Pistol	382.2	1.0	
3	Okfuskenena	Spall	18.0	21.1	Tradegun	379.8	0.9	
3	Okfuskenena	Spall	16.5	21.9	Tradegun	361.4	0.8	
3	Okfuskenena	Spall	21.9	22.0	Tradegun	481.8	1.0	
3	Okfuskenena	Spall	16.6	22.8	Tradegun	378.5	0.7	
3	Okfuskenena	Spall	20.6	23.1	Tradegun	475.9	0.9	
3	Okfuskenena	Spall	17.9	23.6	Tradegun	422.4	0.8	
3	Okfuskenena	Spall	21.1	23.6	Tradegun	498.0	0.9	
3	Okfuskenena	Spall	16.7	24.0	Tradegun	400.8	0.7	
3	Okfuskenena	Spall	22.6	24.5	Tradegun	553.7	0.9	
3	Okfuskenena	Spall	18.0	24.7	Tradegun	444.6	0.7	
3	Okfuskenena	Spall	18.3	24.9	Tradegun	455.7	0.7	
3	Okfuskenena	Spall	20.9	25.0	Tradegun	522.5	0.8	
3	Okfuskenena	Spall	24.5	25.6	Tradegun	627.2	1.0	
3	Okfuskenena	Spall	17.6	25.7	Tradegun	452.3	0.7	
3	Okfuskenena	Spall	24.3	26.3	Tradegun	639.1	0.9	
3	Okfuskenena	Spall	19.8	26.6	Tradegun	526.7	0.7	
3	Okfuskenena	Spall	17.3	26.9	Tradegun	465.4	0.6	
3	Okfuskenena	Spall	20.6	26.9	Tradegun	554.1	0.8	
3	Okfuskenena	Spall	26.1	27.1	Tradegun	707.3	1.0	
3	Okfuskenena	Spall	19.1	27.3	Tradegun	521.4	0.7	
3	Okfuskenena	Spall	20.2	27.3	Tradegun	551.5	0.7	
3	Okfuskenena	Spall	21.0	27.4	Tradegun	575.4	0.8	
3	Okfuskenena	Spall	20.5	27.9	Tradegun	572.0	0.7	
3	Okfuskenena	Spall	21.4	27.9	Tradegun	597.1	0.8	
4	Ft. St. Andrews	Spall	23.5	28.5	Carbine	669.8	0.8	Ferguson collection
4	Ft. St. Andrews	Spall	20.0	29.0	Carbine	580.0	0.7	Ferguson collection
4	Ft. St. Andrews	Spall	23.0	29.0	Carbine	667.0	0.8	Ferguson collection
4	Ft. St. Andrews	Spall	21.0	29.5	Carbine	619.5	0.7	Ferguson collection
4	Ft. St. Andrews	Spall	27.0	30.0	Carbine	810.0	0.9	Ferguson collection
4	Ft. St. Andrews	Spall	33.5	30.5	Carbine	1021.8	1.1	Ferguson collection
4	Ft. St. Andrews	Spall	25.0	31.0	Carbine	775.0	0.8	Ferguson collection

Appendix 1. Gunflint Inventory.

Sample	Site	Type	Length	Width	Weapon	Surf. Area	L/W ratio	Comments
4	Ft. St. Andrews	Spall	31.0	31.0	Carbine	961.0	1.0	Ferguson collection
4	Ft. St. Andrews	Spall	32.0	31.0	Carbine	992.0	1.0	Ferguson collection
4	Ft. St. Andrews	Spall	32.0	31.0	Carbine	992.0	1.0	Ferguson collection
4	Ft. St. Andrews	Spall	26.5	31.5	Carbine	834.8	0.8	Ferguson collection
4	Ft. St. Andrews	Spall	26.5	31.5	Carbine	834.8	0.8	Ferguson collection
4	Ft. St. Andrews	Spall	29.0	31.5	Carbine	913.5	0.9	Ferguson collection
4	Ft. St. Andrews	Spall	31.0	31.5	Carbine	976.5	1.0	Ferguson collection
4	Ft. St. Andrews	Spall	34.5	31.5	Carbine	1086.8	1.1	Ferguson collection
4	Ft. St. Andrews	Spall	24.0	32.0	Carbine	768.0	0.8	Ferguson collection
4	Ft. St. Andrews	Spall	26.5	32.0	Carbine	848.0	0.8	Ferguson collection
4	Ft. St. Andrews	Spall	30.0	32.0	Carbine	960.0	0.9	Ferguson collection
4	Ft. St. Andrews	Spall	27.0	32.5	Carbine	877.5	0.8	Ferguson collection
4	Ft. St. Andrews	Spall	33.5	35.5	Musket	1189.3	0.9	Ferguson collection
4	Ft. St. Andrews	Spall	33.5	36.5	Musket	1222.8	0.9	Ferguson collection
4	Ft. St. Andrews	Spall	19.0	22.5	Tradegun	427.5	0.8	Ferguson collection
4	Ft. St. Andrews	Spall	21.5	23.5	Tradegun	505.3	0.9	Ferguson collection
4	Ft. St. Andrews	Spall	21.0	24.0	Tradegun	504.0	0.9	Ferguson collection
4	Ft. St. Andrews	Spall	24.0	25.0	Tradegun	600.0	1.0	Ferguson collection
4	Ft. St. Andrews	Spall	22.0	26.0	Tradegun	572.0	0.8	Ferguson collection
4	Ft. St. Andrews	Spall	22.5	26.5	Tradegun	596.3	0.8	Ferguson collection
4	Ft. St. Andrews	Spall	25.0	27.5	Tradegun	687.5	0.9	Ferguson collection
4	Ft. St. Andrews	Spall	26.0	27.5	Tradegun	715.0	0.9	Ferguson collection
4	Ft. St. Andrews	Spall	32.0	27.5	Tradegun	880.0	1.2	Ferguson collection
4	Ft. St. Andrews	Spall	22.0	28.0	Tradegun/Carbine	616.0	0.8	Ferguson collection
4	Ft. St. Andrews		42.0	31.0	Carbine	1302.0	1.4	NPS 2007
4	Ft. St. Andrews		36.0	35.0	Musket	1260.0	1.0	NPS 2007
4	Ft. St. Andrews		32.0	38.0	Musket	1216.0	0.8	NPS 2007
4	Ft. St. Andrews		36.0	39.0	Musket	1404.0	0.9	NPS 2007
4	Ft. St. Andrews		38.0	40.0	Musket	1520.0	1.0	NPS 2007
5	Mt. Pleasant	Blade	27.0	32.0	Carbine	864.0	0.8	
5	Mt. Pleasant	Blade	15.0	21.0	Tradegun	315.0	0.7	
5	Mt. Pleasant	Blade	20.0	25.0	Tradegun	500.0	0.8	
5	Mt. Pleasant	Spall	19.0	31.0	Carbine	589.0	0.6	
5	Mt. Pleasant	Spall	20.0	31.0	Carbine	620.0	0.6	
5	Mt. Pleasant	Spall	25.0	31.0	Carbine	775.0	0.8	
5	Mt. Pleasant	Spall	22.0	32.0	Carbine	704.0	0.7	
5	Mt. Pleasant	Spall	29.0	34.0	Carbine	986.0	0.9	
5	Mt. Pleasant	Spall	22.0	36.0	Musket	792.0	0.6	
5	Mt. Pleasant	Spall	16.0	20.0	Tradegun	320.0	0.8	
5	Mt. Pleasant	Spall	19.0	20.0	Tradegun	380.0	1.0	
5	Mt. Pleasant	Spall	19.0	21.0	Tradegun	399.0	0.9	
5	Mt. Pleasant	Spall	20.0	21.0	Tradegun	420.0	1.0	
5	Mt. Pleasant	Spall	19.0	22.0	Tradegun	418.0	0.9	
5	Mt. Pleasant	Spall	19.0	23.0	Tradegun	437.0	0.8	
5	Mt. Pleasant	Spall	19.0	24.0	Tradegun	456.0	0.8	
5	Mt. Pleasant	Spall	23.0	24.0	Tradegun	552.0	1.0	
5	Mt. Pleasant	Spall	15.0	25.0	Tradegun	375.0	0.6	
5	Mt. Pleasant	Spall	18.0	25.0	Tradegun	450.0	0.7	
5	Mt. Pleasant	Spall	28.0	25.0	Tradegun	700.0	1.1	
5	Mt. Pleasant	Spall	19.0	26.0	Tradegun	494.0	0.7	
5	Mt. Pleasant	Spall	19.0	26.0	Tradegun	494.0	0.7	
5	Mt. Pleasant	Spall	20.0	26.0	Tradegun	520.0	0.8	
5	Mt. Pleasant	Spall	21.0	26.0	Tradegun	546.0	0.8	
5	Mt. Pleasant	Spall	21.0	26.0	Tradegun	546.0	0.8	
5	Mt. Pleasant	Spall	22.0	26.0	Tradegun	572.0	0.8	
5	Mt. Pleasant	Spall	18.0	27.0	Tradegun	486.0	0.7	
5	Mt. Pleasant	Spall	19.0	27.0	Tradegun	513.0	0.7	

Appendix 1. Gunflint Inventory.

Sample	Site	Type	Length	Width	Weapon	Surf. Area	L/W ratio	Comments
5	Mt. Pleasant	Spall	19.0	27.0	Tradegun	513.0	0.7	
5	Mt. Pleasant	Spall	20.0	27.0	Tradegun	540.0	0.7	
5	Mt. Pleasant	Spall	20.0	28.0	Tradegun/Carbine	560.0	0.7	
5	Mt. Pleasant	Spall	22.0	28.0	Tradegun/Carbine	616.0	0.8	
5	Mt. Pleasant	Spall	24.0	28.0	Tradegun/Carbine	672.0	0.9	
5	Mt. Pleasant	Spall	25.0	28.0	Tradegun/Carbine	700.0	0.9	
6	Ebenezer	Bifacial	22.0	22.0	Tradegun	484.0	1.0	
6	Ebenezer	Bifacial	18.0	27.0	Tradegun	486.0	0.7	
6	Ebenezer	Bifacial	18.0	31.0	Carbine	558.0	0.6	
6	Ebenezer	Blade	19.0	30.0	Carbine	570.0	0.6	
6	Ebenezer	Blade	26.0	38.0	Musket	988.0	0.7	
6	Ebenezer	Blade	24.0	39.0	Musket	936.0	0.6	
6	Ebenezer	Blade	18.0	19.0	Pistol	342.0	0.9	
6	Ebenezer	Blade	16.0	20.0	Tradegun	320.0	0.8	
6	Ebenezer	Blade	19.0	21.0	Tradegun	399.0	0.9	
6	Ebenezer	Blade	17.0	23.0	Tradegun	391.0	0.7	
6	Ebenezer	Blade	21.0	23.0	Tradegun	483.0	0.9	
6	Ebenezer	Blade	19.0	28.0	Tradegun/Carbine	532.0	0.7	
6	Ebenezer	Spall	19.0	29.0	Carbine	551.0	0.7	
6	Ebenezer	Spall	19.0	29.0	Carbine	551.0	0.7	
6	Ebenezer	Spall	19.0	29.0	Carbine	551.0	0.7	
6	Ebenezer	Spall	23.0	30.0	Carbine	690.0	0.8	
6	Ebenezer	Spall	24.0	33.0	Carbine	792.0	0.7	
6	Ebenezer	Spall	25.0	34.0	Carbine	850.0	0.7	
6	Ebenezer	Spall	15.0	35.0	Musket	525.0	0.4	
6	Ebenezer	Spall	12.0	20.0	Tradegun	240.0	0.6	
6	Ebenezer	Spall	21.0	21.0	Tradegun	441.0	1.0	
6	Ebenezer	Spall	16.0	22.0	Tradegun	352.0	0.7	
6	Ebenezer	Spall	19.0	22.0	Tradegun	418.0	0.9	
6	Ebenezer	Spall	21.0	22.0	Tradegun	462.0	1.0	
6	Ebenezer	Spall	20.0	23.0	Tradegun	460.0	0.9	
6	Ebenezer	Spall	20.0	23.0	Tradegun	460.0	0.9	
6	Ebenezer	Spall	14.0	24.0	Tradegun	336.0	0.6	
6	Ebenezer	Spall	16.0	24.0	Tradegun	384.0	0.7	
6	Ebenezer	Spall	23.0	24.0	Tradegun	552.0	1.0	
6	Ebenezer	Spall	21.0	25.0	Tradegun	525.0	0.8	
6	Ebenezer	Spall	18.0	26.0	Tradegun	468.0	0.7	
6	Ebenezer	Spall	22.0	27.0	Tradegun	594.0	0.8	
6	Ebenezer	Spall	17.0	28.0	Tradegun/Carbine	476.0	0.6	
7	Fort Argyle	Blade	18.6	13	Pistol	241.8	1.4	Elliott 1997
7	Fort Argyle	Spall	22.8	29.9	Carbine	681.7	0.8	Elliott 1997
7	Fort Argyle	Spall	22	30.1	Carbine	662.2	0.7	Elliott 1997
7	Fort Argyle	Spall	28.6	30.8	Carbine	880.9	0.9	Elliott 1997
7	Fort Argyle	Spall	31.8	30.9	Carbine	982.6	1.0	Elliott 1997
7	Fort Argyle	Spall	27.3	32.8	Carbine	895.4	0.8	Elliott 1997
7	Fort Argyle	Spall	33.2	35.6	Musket	1181.9	0.9	Elliott 1997
7	Fort Argyle	Spall	15.7	19.4	Pistol	304.6	0.8	Elliott 1997
7	Fort Argyle	Spall	15.4	19	Pistol	292.6	0.8	Elliott 1997
7	Fort Argyle	Spall	13.6	15	Pistol	204.0	0.9	Elliott 1997
7	Fort Argyle	Spall	17.3	18.7	Pistol	323.5	0.9	Elliott 1997
7	Fort Argyle	Spall	15.2	15.2	Pistol	231.0	1.0	Elliott 1997
7	Fort Argyle	Spall	15.2	15.1	Pistol	229.5	1.0	Elliott 1997
7	Fort Argyle	Spall	17	20.4	Tradegun	346.8	0.8	Elliott 1997
7	Fort Argyle	Spall	18.2	21.6	Tradegun	393.1	0.8	Elliott 1997
7	Fort Argyle	Spall	15.7	22.6	Tradegun	354.8	0.7	Elliott 1997
7	Fort Argyle	Spall	18	23.1	Tradegun	415.8	0.8	Elliott 1997

Appendix 1. Gunflint Inventory.

Sample	Site	Type	Length	Width	Weapon	Surf. Area	L/W ratio	Comments
7	Fort Argyle	Spall	22.8	23.3	Tradegun	531.2	1.0	Elliott 1997
7	Fort Argyle	Spall	19.9	24.3	Tradegun	483.6	0.8	Elliott 1997
7	Fort Argyle	Spall	16.1	25.1	Tradegun	404.1	0.6	Elliott 1997
7	Fort Argyle	Spall	20.4	25.4	Tradegun	518.2	0.8	Elliott 1997
7	Fort Argyle	Spall	27.2	27.7	Tradegun	753.4	1.0	Elliott 1997
7	Fort Argyle	Spall	21.2	28	Tradegun/Carbine	593.6	0.8	Elliott 1997
7	Fort Argyle		20.0	30.0	Carbine	600.0	0.7	Braley 1985
7	Fort Argyle		17.0	18.0	Pistol	306.0	0.9	Braley 1985
7	Fort Argyle		18.0	22.0	Tradegun	396.0	0.8	Braley 1985
7	Fort Argyle		17.0	25.0	Tradegun	425.0	0.7	Braley 1985
7	Fort Argyle		19.0	27.0	Tradegun	513.0	0.7	Braley 1985
7	Fort Argyle		27.0	27.0	Tradegun	729.0	1.0	Braley 1985
8	Fort Morris	Blade	17.2	28.2	Carbine	485.0	0.6	
8	Fort Morris	Blade	21.7	29.5	Carbine	640.2	0.7	
8	Fort Morris	Blade	30.2	32.1	Carbine	969.4	0.9	
8	Fort Morris	Blade	23.8	24.3	Tradegun	578.3	1.0	
8	Fort Morris	Blade	17.0	24.4	Tradegun	414.8	0.7	
8	Fort Morris	Blade	23.0	26.5	Tradegun	609.5	0.9	
8	Fort Morris	Blade	22.7	27.1	Tradegun	615.2	0.8	
8	Fort Morris	Blade	25.4	27.2	Tradegun	690.9	0.9	
8	Fort Morris	Blade	22.2	27.8	Tradegun	617.2	0.8	
8	Fort Morris	Spall	25.5	28.3	Carbine	721.7	0.9	
8	Fort Morris	Spall	22.2	28.7	Carbine	637.1	0.8	
8	Fort Morris	Spall	25.5	28.7	Carbine	731.9	0.9	
8	Fort Morris	Spall	25.2	29.3	Carbine	738.4	0.9	
8	Fort Morris	Spall	21.9	30.6	Carbine	670.1	0.7	
8	Fort Morris	Spall	27.2	30.6	Carbine	832.3	0.9	
8	Fort Morris	Spall	23.3	31.2	Carbine	727.0	0.7	
8	Fort Morris	Spall	27.8	31.3	Carbine	870.1	0.9	
8	Fort Morris	Spall	29.1	32.5	Carbine	945.8	0.9	
8	Fort Morris	Spall	31.7	32.5	Carbine	1030.3	1.0	
8	Fort Morris	Spall	23.2	34.2	Musket	793.4	0.7	
8	Fort Morris	Spall	30.2	34.2	Musket	1032.8	0.9	
8	Fort Morris	Spall	30.2	36.5	Musket	1102.3	0.8	
8	Fort Morris	Spall	32.6	38.7	Musket	1261.6	0.8	
8	Fort Morris	Spall	31.4	39.3	Musket	1234.0	0.8	
8	Fort Morris	Spall	25.8	25.4	Tradegun	655.3	1.0	
8	Fort Morris	Spall	21.5	25.7	Tradegun	552.6	0.8	
8	Fort Morris	Spall	17.7	25.9	Tradegun	458.4	0.7	
9	Sansavilla Bluff	Blade	15.0	27.0	Tradegun	405.0	0.6	Steed collection
9	Sansavilla Bluff	Spall	28.0	30.0	Carbine	840.0	0.9	Steed collection
9	Sansavilla Bluff	Spall	27.0	31.0	Carbine	837.0	0.9	Steed collection
9	Sansavilla Bluff	Spall	25.0	28.0	Tradegun/Carbine	700.0	0.9	Steed collection
9	Sansavilla Bluff	Spall	22.0	29.0	Carbine	638.0	0.8	Elliott 2005a
9	Sansavilla Bluff	Spall	22.0	29.0	Carbine	638.0	0.8	Elliott 2005a
9	Sansavilla Bluff	Spall	27.0	29.0	Carbine	783.0	0.9	Elliott 2005a
9	Sansavilla Bluff	Spall	19.0	30.0	Carbine	570.0	0.6	Elliott 2005a
9	Sansavilla Bluff	Spall	22.0	33.0	Carbine	726.0	0.7	Elliott 2005a
9	Sansavilla Bluff	Spall	19.0	27.0	Tradegun	513.0	0.7	Elliott 2005a
9	Sansavilla Bluff	Spall	23.0	28.0	Tradegun/Carbine	644.0	0.8	Elliott 2005a
9	Sansavilla Bluff	Spall	22.0	29.0	Carbine	638.0	0.8	Morris collection
9	Sansavilla Bluff	Spall	26.0	29.0	Carbine	754.0	0.9	Morris collection
9	Sansavilla Bluff	Spall	24.0	30.0	Carbine	720.0	0.8	Morris collection
9	Sansavilla Bluff	Spall	24.0	32.0	Carbine	768.0	0.8	Morris collection
9	Sansavilla Bluff	Spall	28.0	34.0	Carbine	952.0	0.8	Morris collection
9	Sansavilla Bluff	Spall	23.0	24.0	Tradegun	552.0	1.0	Morris collection

Appendix 1. Gunflint Inventory.

Sample	Site	Type	Length	Width	Weapon	Surf. Area	L/W ratio	Comments
9	Sansavilla Bluff	Spall	24.0	27.0	Tradegun	648.0	0.9	Morris collection
9	Sansavilla Bluff	Spall	27.0	28.0	Tradegun/Carbine	756.0	1.0	Morris collection
10	Ossabaw	Blade	25.0	32.0	Carbine	800.0	0.8	
10	Ossabaw	Blade	18.0	22.0	Tradegun	396.0	0.8	
10	Ossabaw	Blade	24.0	27.0	Tradegun	648.0	0.9	
10	Ossabaw	Spall	23.0	29.0	Carbine	667.0	0.8	
10	Ossabaw	Spall	27.0	29.0	Carbine	783.0	0.9	
10	Ossabaw	Spall	18.0	23.0	Tradegun	414.0	0.8	
10	Ossabaw	Spall	20.0	24.0	Tradegun	480.0	0.8	
11	Buzzard's Roost	Spall	25.0	29.0	Carbine	725.0	0.9	
11	Buzzard's Roost	Spall	24.0	29.0	Carbine	696.0	0.8	
11	Buzzard's Roost	Spall	27.0	27.0	Tradegun	729.0	1.0	
11	Buzzard's Roost	Spall	27.0	27.0	Tradegun	729.0	1.0	
12	Savannah	Blade	17.0	31.0	Carbine	527.0	0.5	Madison Square
12	Savannah	Spall	28.0	32.0	Carbine	896.0	0.9	Madison Square
12	Savannah	Spall	32.0	36.0	Musket	1152.0	0.9	Spring Hill Redoubt
13	Tybee Island	Blade	20.9	28.7	Carbine	599.8	0.7	
13	Tybee Island	Spall	29.3	29.5	Carbine	864.4	1.0	
14	9CE379	Blade	15.3	13.8	Pistol	211.1	1.1	
14	9CE379	Blade	15.4	15.4	Pistol	237.2	1.0	
15	Savano Town	Spall	19.0	29.0	Carbine	551.0	0.7	
15	Savano Town	Spall	24.0	29.0	Carbine	696.0	0.8	
15	Savano Town	Spall	27.0	30.0	Carbine	810.0	0.9	
15	Savano Town	Spall	24.0	32.0	Carbine	768.0	0.8	
15	Savano Town	Spall	27.0	32.0	Carbine	864.0	0.8	
15	Savano Town	Spall	29.0	32.0	Carbine	928.0	0.9	
15	Savano Town	Spall	28.0	33.0	Carbine	924.0	0.8	
15	Savano Town	Spall	30.0	35.0	Musket	1050.0	0.9	
15	Savano Town	Spall	15.0	18.0	Pistol	270.0	0.8	
15	Savano Town	Spall	23.0	20.0	Tradegun	460.0	1.2	
15	Savano Town	Spall	17.0	22.0	Tradegun	374.0	0.8	
15	Savano Town	Spall	17.0	23.0	Tradegun	391.0	0.7	
15	Savano Town	Spall	23.0	24.0	Tradegun	552.0	1.0	
15	Savano Town	Spall	18.0	25.0	Tradegun	450.0	0.7	
15	Savano Town	Spall	18.0	25.0	Tradegun	450.0	0.7	
15	Savano Town	Spall	21.0	25.0	Tradegun	525.0	0.8	
15	Savano Town	Spall	24.0	25.0	Tradegun	600.0	1.0	
15	Savano Town	Spall	23.0	28.0	Tradegun/Carbine	644.0	0.8	
15	Savano Town	Spall	24.0	28.0	Tradegun/Carbine	672.0	0.9	
16	Fort Moore	Bifacial	18.0	28.0	Tradegun/Carbine	504.0	0.6	
16	Fort Moore	Blade	18.0	23.0	Tradegun	414.0	0.8	
16	Fort Moore	Blade	22.0	25.0	Tradegun	550.0	0.9	
16	Fort Moore	Blade	27.0	27.0	Tradegun	729.0	1.0	
16	Fort Moore	Spall	25.0	29.0	Carbine	725.0	0.9	
16	Fort Moore	Spall	19.0	30.0	Carbine	570.0	0.6	
16	Fort Moore	Spall	24.0	30.0	Carbine	720.0	0.8	
16	Fort Moore	Spall	19.0	31.0	Carbine	589.0	0.6	
16	Fort Moore	Spall	21.0	32.0	Carbine	672.0	0.7	
16	Fort Moore	Spall	19.0	21.0	Tradegun	399.0	0.9	
16	Fort Moore	Spall	20.0	23.0	Tradegun	460.0	0.9	
16	Fort Moore	Spall	19.0	25.0	Tradegun	475.0	0.8	
16	Fort Moore	Spall	20.0	25.0	Tradegun	500.0	0.8	
16	Fort Moore	Spall	23.0	26.0	Tradegun	598.0	0.9	
16	Fort Moore	Spall	26.0	27.0	Tradegun	702.0	1.0	
16	Fort Moore	Spall	27.0	27.0	Tradegun	729.0	1.0	
17	New Windsor	Bifacial	19.0	26.0	Tradegun	494.0	0.7	
17	New Windsor	Blade	18.0	24.0	Tradegun	432.0	0.8	

Appendix 1. Gunflint Inventory.

Sample	Site	Type	Length	Width	Weapon	Surf. Area	L/W ratio	Comments
17	New Windsor	Spall	18.0	29.0	Carbine	522.0	0.6	
17	New Windsor	Spall	22.0	29.0	Carbine	638.0	0.8	
17	New Windsor	Spall	24.0	31.0	Carbine	744.0	0.8	
17	New Windsor	Spall	22.0	32.0	Carbine	704.0	0.7	
17	New Windsor	Spall	23.0	32.0	Carbine	736.0	0.7	
17	New Windsor	Spall	24.0	32.0	Carbine	768.0	0.8	
17	New Windsor	Spall	30.0	32.0	Carbine	960.0	0.9	
17	New Windsor	Spall	20.0	18.0	Pistol	360.0	1.1	
17	New Windsor	Spall	20.0	17.0	Pistol	340.0	1.2	
17	New Windsor	Spall	16.0	20.0	Tradegun	320.0	0.8	
17	New Windsor	Spall	21.0	20.0	Tradegun	420.0	1.1	
17	New Windsor	Spall	19.0	21.0	Tradegun	399.0	0.9	
17	New Windsor	Spall	24.0	23.0	Tradegun	552.0	1.0	
17	New Windsor	Spall	24.0	23.0	Tradegun	552.0	1.0	
17	New Windsor	Spall	17.0	24.0	Tradegun	408.0	0.7	
17	New Windsor	Spall	18.0	24.0	Tradegun	432.0	0.8	
17	New Windsor	Spall	22.0	25.0	Tradegun	550.0	0.9	
17	New Windsor	Spall	22.0	25.0	Tradegun	550.0	0.9	
17	New Windsor	Spall	24.0	25.0	Tradegun	600.0	1.0	
17	New Windsor	Spall	24.0	26.0	Tradegun	624.0	0.9	
17	New Windsor	Spall	24.0	26.0	Tradegun	624.0	0.9	
17	New Windsor	Spall	19.0	27.0	Tradegun	513.0	0.7	
17	New Windsor	Spall	18.0	28.0	Tradegun/Carbine	504.0	0.6	
17	New Windsor	Spall	19.0	28.0	Tradegun/Carbine	532.0	0.7	
17	New Windsor	Spall	22.0	28.0	Tradegun/Carbine	616.0	0.8	
17	New Windsor	Spall	28.0	28.0	Tradegun/Carbine	784.0	1.0	
18	Daniels Island	Blade	24.2	29.5	Carbine	713.9	0.8	
18	Daniels Island	Blade	24.0	31.7	Carbine	760.8	0.8	
18	Daniels Island	Blade	18.6	20.2	Tradegun	375.7	0.9	
18	Daniels Island	Blade	19.3	20.2	Tradegun	389.9	1.0	
18	Daniels Island	Blade	19.0	22.3	Tradegun	423.7	0.9	
18	Daniels Island	Blade	19.7	23.6	Tradegun	464.9	0.8	
18	Daniels Island	Blade	15.6	24.3	Tradegun	379.1	0.6	
18	Daniels Island	Blade	21.7	26.4	Tradegun	572.9	0.8	
18	Daniels Island	Blade	19.0	26.8	Tradegun	509.2	0.7	
18	Daniels Island	Blade	23.0	27.0	Tradegun	621.0	0.9	
18	Daniels Island	Blade	26.3	27.6	Tradegun	725.9	1.0	
18	Daniels Island	Blade	17.8	27.9	Tradegun	496.6	0.6	
18	Daniels Island	Blade	22.2	27.9	Tradegun	619.4	0.8	
18	Daniels Island	Spall	22.0	28.4	Carbine	624.8	0.8	
18	Daniels Island	Spall	20.9	28.6	Carbine	597.7	0.7	
18	Daniels Island	Spall	22.0	28.7	Carbine	631.4	0.8	
18	Daniels Island	Spall	19.4	28.9	Carbine	560.7	0.7	
18	Daniels Island	Spall	25.5	29.2	Carbine	744.6	0.9	
18	Daniels Island	Spall	22.9	29.3	Carbine	671.0	0.8	
18	Daniels Island	Spall	23.0	29.9	Carbine	687.7	0.8	
18	Daniels Island	Spall	23.5	30.0	Carbine	705.0	0.8	
18	Daniels Island	Spall	29.3	31.1	Carbine	911.2	0.9	
18	Daniels Island	Spall	20.9	31.7	Carbine	662.5	0.7	
18	Daniels Island	Spall	19.1	33.0	Carbine	630.3	0.6	
18	Daniels Island	Spall	22.2	33.1	Carbine	734.8	0.7	
18	Daniels Island	Spall	29.3	33.6	Carbine	984.5	0.9	
18	Daniels Island	Spall	25.0	34.0	Carbine	850.0	0.7	
18	Daniels Island	Spall	29.0	35.7	Musket	1035.3	0.8	
18	Daniels Island	Spall	22.0	21.0	Tradegun	462.0	1.0	
18	Daniels Island	Spall	15.2	21.2	Tradegun	322.2	0.7	

Appendix 1. Gunflint Inventory.

Sample	Site	Type	Length	Width	Weapon	Surf. Area	L/W ratio	Comments
18	Daniels Island	Spall	23.4	21.2	Tradegun	496.1	1.1	
18	Daniels Island	Spall	21.0	22.0	Tradegun	462.0	1.0	
18	Daniels Island	Spall	21.6	22.0	Tradegun	475.2	1.0	
18	Daniels Island	Spall	17.2	22.4	Tradegun	385.3	0.8	
18	Daniels Island	Spall	21.6	22.5	Tradegun	486.0	1.0	
18	Daniels Island	Spall	18.5	22.6	Tradegun	418.1	0.8	
18	Daniels Island	Spall	21.9	22.9	Tradegun	501.5	1.0	
18	Daniels Island	Spall	22.5	23.1	Tradegun	519.8	1.0	
18	Daniels Island	Spall	21.2	23.6	Tradegun	500.3	0.9	
18	Daniels Island	Spall	22.8	23.7	Tradegun	540.4	1.0	
18	Daniels Island	Spall	24.6	24.4	Tradegun	600.2	1.0	
18	Daniels Island	Spall	17.6	25.6	Tradegun	450.6	0.7	
18	Daniels Island	Spall	20.8	26.0	Tradegun	540.8	0.8	
18	Daniels Island	Spall	20.8	26.6	Tradegun	553.3	0.8	
18	Daniels Island	Spall	22.5	26.7	Tradegun	600.8	0.8	
18	Daniels Island	Spall	21.4	26.9	Tradegun	575.7	0.8	
18	Daniels Island	Spall	23.6	27.2	Tradegun	641.9	0.9	
18	Daniels Island	Spall	19.7	27.4	Tradegun	539.8	0.7	
19	Yuchi Town	Bifacial	20.9	17.5	Pistol	365.8	1.2	Hargrave et al. 1998
19	Yuchi Town	Blade	24.9	22.6	Tradegun	562.7	1.1	Hargrave et al. 1998
19	Yuchi Town	Spall	17.0	16.9	Pistol	287.3	1.0	Hargrave et al. 1998
19	Yuchi Town	Spall	21.0	19.7	Pistol	413.7	1.1	Hargrave et al. 1998
19	Yuchi Town	Spall	22.7	16.4	Pistol	372.3	1.4	Hargrave et al. 1998
19	Yuchi Town	Spall	23.6	20.1	Tradegun	474.4	1.2	Hargrave et al. 1998
19	Yuchi Town	Spall	22.8	20.5	Tradegun	467.4	1.1	Hargrave et al. 1998
19	Yuchi Town	Spall	32.8	21.0	Tradegun	688.8	1.6	Hargrave et al. 1998
19	Yuchi Town	**Spall**	**25.0**	**22.9**	Tradegun	**572.5**	**1.1**	Hargrave et al. 1998
19	Yuchi Town	Blade	18.1	21.4	Tradegun	387.3	0.8	Weisman 2000
19	Yuchi Town	Blade	17.8	26.5	Tradegun	471.7	0.7	Weisman 2000
19	Yuchi Town	Spall	19.6	28.1	Carbine	550.8	0.7	Weisman 2000
19	Yuchi Town	Spall	24.9	30.5	Carbine	759.5	0.8	Weisman 2000
19	Yuchi Town	Spall	18.0	18.3	Pistol	329.4	1.0	Weisman 2000
19	Yuchi Town	Spall	19.7	23.8	Tradegun	468.9	0.8	Weisman 2000
19	Yuchi Town	Spall	19.2	24.0	Tradegun	460.8	0.8	Weisman 2000
19	Yuchi Town	Spall	19.5	25.7	Tradegun	501.2	0.8	Weisman 2000
19	Yuchi Town	Spall	21.4	26.6	Tradegun	569.2	0.8	Weisman 2000
19	Yuchi Town	Spall	21.2	27.4	Tradegun	580.9	0.8	Weisman 2000
19	Yuchi Town	Spall	23.3	27.6	Tradegun	643.1	0.8	Weisman 2000
19	Yuchi Town	Undetermine	23.1	27.5	Tradegun	635.3	0.8	Weisman 2000
20	Old Mobile	Spall	23.8	28.1	Carbine	668.8	0.8	
20	Old Mobile	Spall	18.7	28.2	Carbine	527.3	0.7	
20	Old Mobile	Spall	28.7	28.8	Carbine	826.6	1.0	
20	Old Mobile	Spall	17.1	29.1	Carbine	497.6	0.6	
20	Old Mobile	Spall	25.7	29.4	Carbine	755.6	0.9	
20	Old Mobile	Spall	19.0	29.8	Carbine	566.2	0.6	
20	Old Mobile	Spall	26.4	29.8	Carbine	786.7	0.9	
20	Old Mobile	Spall	19.8	30.0	Carbine	594.0	0.7	
20	Old Mobile	Spall	21.5	30.3	Carbine	651.5	0.7	
20	Old Mobile	Spall	27.7	30.7	Carbine	850.4	0.9	
20	Old Mobile	Spall	21.3	31.1	Carbine	662.4	0.7	
20	Old Mobile	Spall	23.0	31.1	Carbine	715.3	0.7	
20	Old Mobile	Spall	26.8	31.8	Carbine	852.2	0.8	
20	Old Mobile	Spall	23.3	33.1	Carbine	771.2	0.7	
20	Old Mobile	Spall	27.6	35.0	Musket	966.0	0.8	
20	Old Mobile	Spall	16.9	19.7	Pistol	332.9	0.9	
20	Old Mobile	Spall	19.0	21.7	Tradegun	412.3	0.9	
20	Old Mobile	Spall	15.3	22.8	Tradegun	348.8	0.7	

Appendix 1. Gunflint Inventory.

Sample	Site	Type	Length	Width	Weapon	Surf. Area	L/W ratio	Comments
20	Old Mobile	Spall	17.1	24.4	Tradegun	417.2	0.7	
20	Old Mobile	Spall	20.6	24.6	Tradegun	506.8	0.8	
20	Old Mobile	Spall	22.9	25.0	Tradegun	572.5	0.9	
20	Old Mobile	Spall	20.5	25.1	Tradegun	514.6	0.8	
20	Old Mobile	Spall	20.8	25.4	Tradegun	528.3	0.8	
20	Old Mobile	Spall	20.0	25.5	Tradegun	510.0	0.8	
20	Old Mobile	Spall	21.7	25.6	Tradegun	555.5	0.8	
20	Old Mobile	Spall	20.4	26.0	Tradegun	530.4	0.8	
20	Old Mobile	Spall	21.8	26.0	Tradegun	566.8	0.8	
20	Old Mobile	Spall	21.3	26.2	Tradegun	558.1	0.8	
20	Old Mobile	Spall	19.3	26.3	Tradegun	507.6	0.7	
20	Old Mobile	Spall	19.4	26.3	Tradegun	510.2	0.7	
20	Old Mobile	Spall	21.3	26.4	Tradegun	562.3	0.8	
20	Old Mobile	Spall	22.0	26.4	Tradegun	580.8	0.8	
20	Old Mobile	Spall	24.3	27.6	Tradegun	670.7	0.9	
20	Old Mobile	Spall	27.5	27.7	Tradegun	761.8	1.0	
21	Mialoquo	Blade	18.0	24.5	Tradegun	441.0	0.7	
21	Mialoquo	Blade	18.0	25.0	Tradegun	450.0	0.7	
21	Mialoquo	Spall	19.0	29.0	Carbine	551.0	0.7	
21	Mialoquo	Spall	23.0	29.0	Carbine	667.0	0.8	
21	Mialoquo	Spall	25.5	29.5	Carbine	752.3	0.9	
21	Mialoquo	Spall	23.0	30.0	Carbine	690.0	0.8	
21	Mialoquo	Spall	21.0	32.0	Carbine	672.0	0.7	
21	Mialoquo	Spall	17.0	19.0	Pistol	323.0	0.9	
21	Mialoquo	Spall	17.5	19.0	Pistol	332.5	0.9	
21	Mialoquo	Spall	20.0	21.5	Tradegun	430.0	0.9	
21	Mialoquo	Spall	20.5	22.5	Tradegun	461.3	0.9	
21	Mialoquo	Spall	17.0	24.0	Tradegun	408.0	0.7	
21	Mialoquo	Spall	18.5	25.5	Tradegun	471.8	0.7	
21	Mialoquo	Spall	20.0	26.0	Tradegun	520.0	0.8	
21	Mialoquo	Spall	20.5	26.0	Tradegun	533.0	0.8	
21	Mialoquo	Spall	21.5	26.0	Tradegun	559.0	0.8	
21	Mialoquo	Spall	29.0	26.0	Tradegun	754.0	1.1	
21	Mialoquo	Spall	23.5	27.5	Tradegun	646.3	0.9	
21	Mialoquo	Spall	19.5	28.0	Tradegun/Carbine	546.0	0.7	
22	Gilbert	Bifacial	19.0	16.0	Pistol	304.0	1.2	
22	Gilbert	Bifacial	17.0	21.0	Tradegun	357.0	0.8	
22	Gilbert	Bifacial	20.0	21.0	Tradegun	420.0	1.0	
22	Gilbert	Bifacial	23.0	21.0	Tradegun	483.0	1.1	
22	Gilbert	Bifacial	21.0	22.0	Tradegun	462.0	1.0	
22	Gilbert	Bifacial	19.0	23.0	Tradegun	437.0	0.8	
22	Gilbert	Bifacial	20.0	23.0	Tradegun	460.0	0.9	
22	Gilbert	Bifacial	20.0	23.0	Tradegun	460.0	0.9	
22	Gilbert	Bifacial	21.0	23.0	Tradegun	483.0	0.9	
22	Gilbert	Bifacial	18.0	24.0	Tradegun	432.0	0.8	
22	Gilbert	Bifacial	19.0	25.0	Tradegun	475.0	0.8	
22	Gilbert	Bifacial	22.0	25.0	Tradegun	550.0	0.9	
22	Gilbert	Bifacial	17.0	26.0	Tradegun	442.0	0.7	
22	Gilbert	Bifacial	20.0	28.0	Tradegun/Carbine	560.0	0.7	
22	Gilbert	Blade	19.0	20.0	Tradegun	380.0	1.0	
22	Gilbert	Blade	18.0	26.0	Tradegun	468.0	0.7	
22	Gilbert	Blade	20.0	28.0	Tradegun/Carbine	560.0	0.7	
23	Pearson	Bifacial	23.0	31.0	Carbine	713.0	0.7	
23	Pearson	Bifacial	21.0	21.0	Tradegun	441.0	1.0	
23	Pearson	Bifacial	23.0	23.0	Tradegun	529.0	1.0	
23	Pearson	Spall	18.0	20.0	Tradegun	360.0	0.9	
23	Pearson	Spall	24.0	26.0	Tradegun	624.0	0.9	

Appendix 1. Gunflint Inventory.

Sample	Site	Type	Length	Width	Weapon	Surf. Area	L/W ratio	Comments
24	Ackia	Bifacial	20.1	19.8	Pistol	398.0	1.0	
24	Ackia	Bifacial	16.4	24.8	Tradegun	406.7	0.7	
24	Ackia	Bifacial	20.5	24.8	Tradegun	508.4	0.8	
24	Ackia	Bifacial	24.5	26.2	Tradegun	641.9	0.9	
24	Ackia	Spall	29.9	28.4	Carbine	849.2	1.1	
24	Ackia	Spall	28.5	29.9	Carbine	852.2	1.0	
24	Ackia	Spall	19.0	30.4	Carbine	577.6	0.6	
24	Ackia	Spall	18.1	21.2	Tradegun	383.7	0.9	
24	Ackia	Spall	16.7	21.6	Tradegun	360.7	0.8	
24	Ackia	Spall	16.8	24.0	Tradegun	403.2	0.7	
24	Ackia	Spall	16.8	26.0	Tradegun	436.8	0.6	
24	Ackia	Spall	21.1	26.5	Tradegun	559.2	0.8	
24	Ackia	Spall	24.2	27.2	Tradegun	658.2	0.9	
24	Ackia	Spall	24.3	27.2	Tradegun	661.0	0.9	
24	Ackia	Spall	22.8	27.3	Tradegun	622.4	0.8	
24	Ackia	Spall	24.2	27.3	Tradegun	660.7	0.9	
24	Ackia	Spall	24.7	27.8	Tradegun	686.7	0.9	
24	Ackia	Spall/bif	17.4	25.5	Tradegun	443.7	0.7	
25	9Me394	Spall	18.5	18.9	Pistol	349.7	1.0	
25	9Me394	Spall	20.6	19.2	Pistol	395.5	1.1	
25	9Me394	Spall	16.7	25.1	Tradegun	419.2	0.7	
25	9Me394	Blade	14.5	17.3	Pistol	250.9	0.8	
25	9Me394	Blade	20.5	20.5	Tradegun	420.3	1.0	
25	9Me394	Blade	26.5	26.9	Tradegun	712.9	1.0	
26	9Me395	Spall	20.2	21.5	Tradegun	434.3	0.9	
26	9Me395	Spall	16.3	24.7	Tradegun	402.6	0.7	
26	9Me395	Blade	14.3	16.4	Pistol	234.5	0.9	
26	9Me395	Blade	16.5	20.9	Tradegun	344.9	0.8	
26	9Me395	Blade	17.4	23.7	Tradegun	412.4	0.7	
26	9Me395	Blade	20.8	23.8	Tradegun	495.0	0.9	
27	9Me472	Blade	14.3	17	Pistol	243.1	0.8	
27	9Me472	Spall/Blade	25	25.3	Tradegun	632.5	1.0	