

UNDERSTANDING CANADA THISTLE IN ANCHORAGE, ALASKA



Tracking changes since 2011

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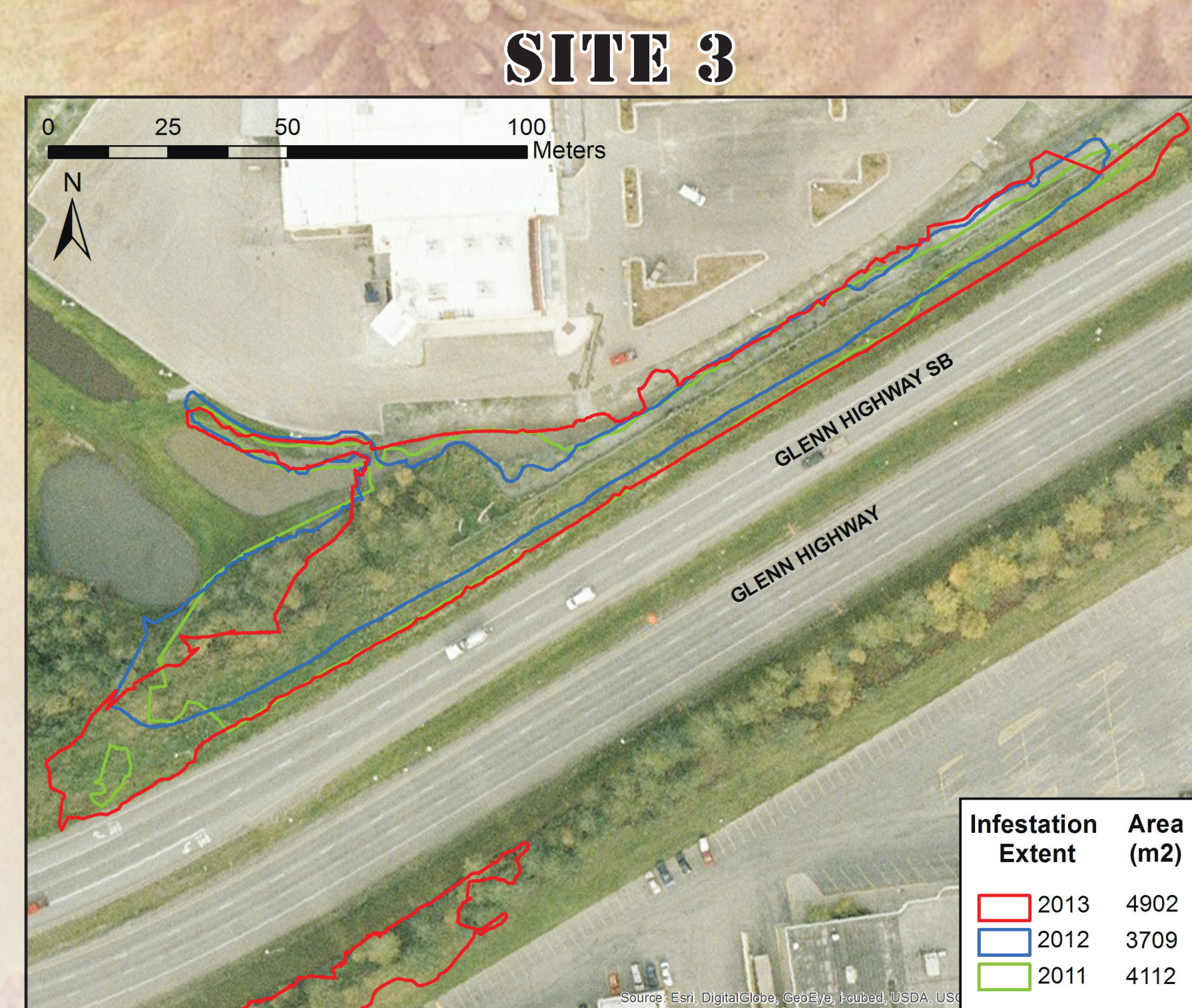
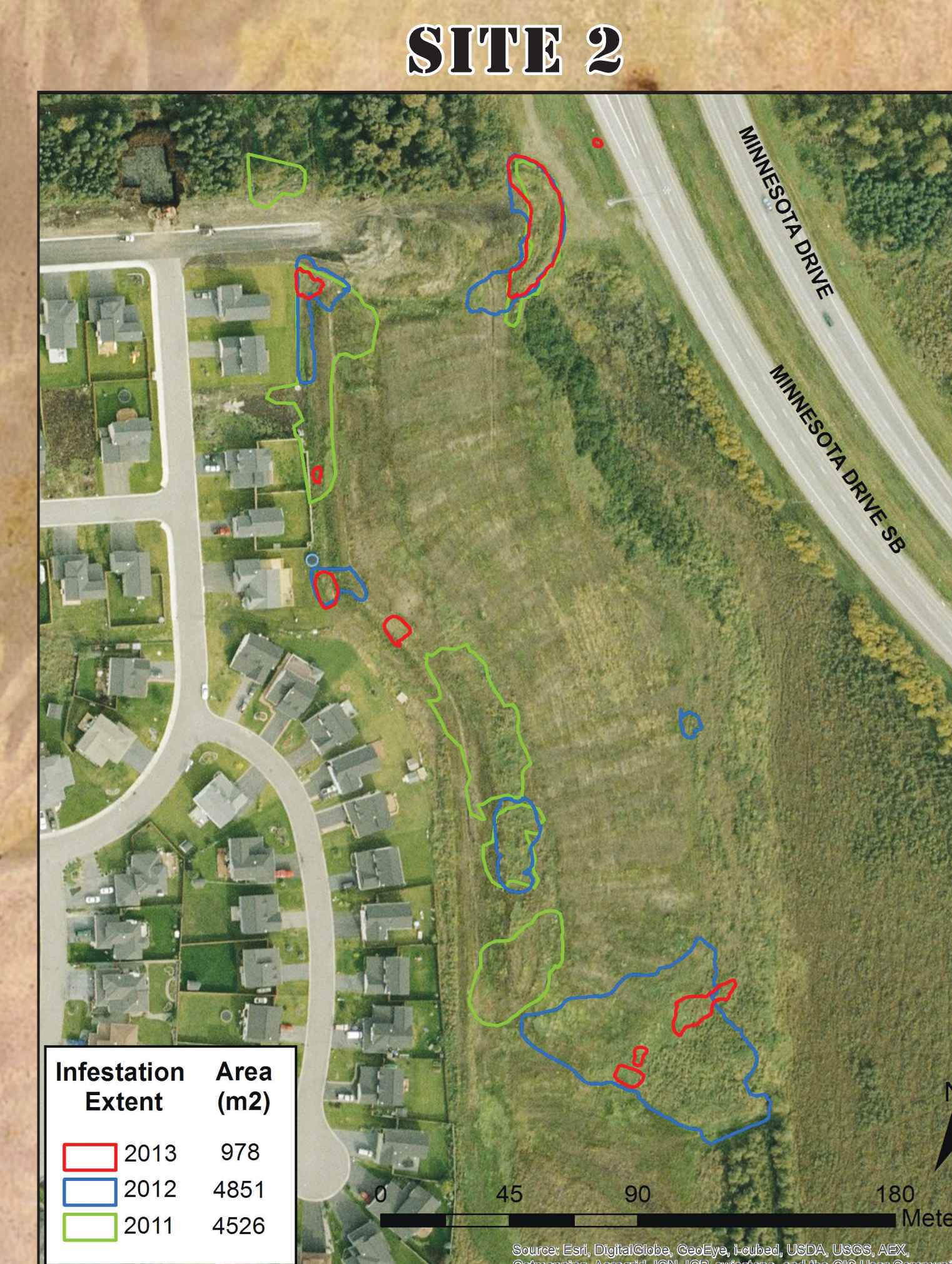
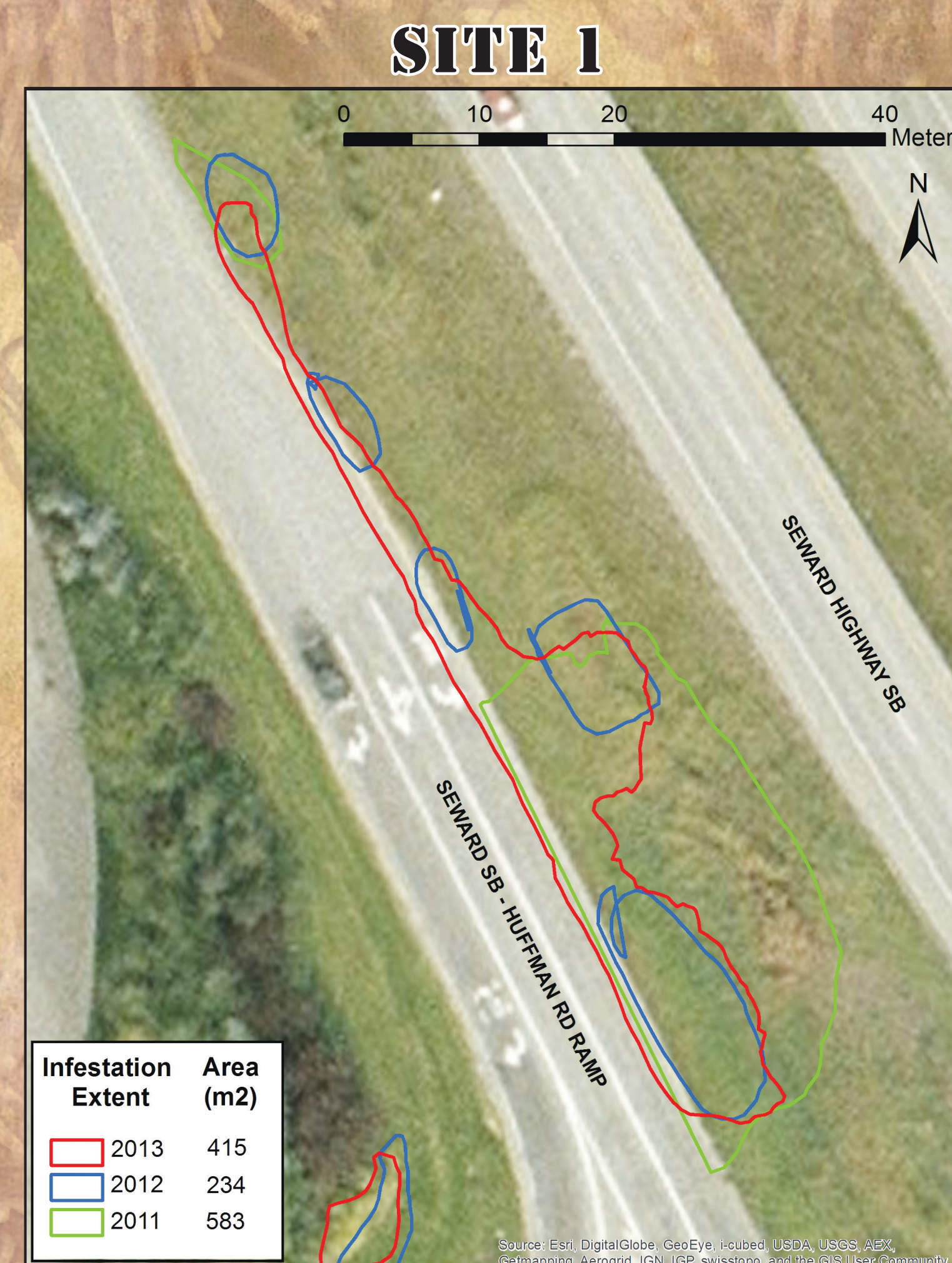
ABSTRACT

Cirsium arvense (Canada thistle) has been consistently identified in the Anchorage, Alaska area since 2002 (AKEPIC, 2013). However, consistent and quantitative inventory of its extent, changes in growth pattern, and density have been documented for only a short period of time. Since 2011, GPS data has been collected by the Municipality of Anchorage and the Alaska Division of Agriculture at known Canada thistle infestation sites in the Anchorage area. To quantify extents of the known infestations, calculations of area, differences of area from year-to-year, and overlapping percentages were calculated. Four sites were chosen for this study based on size of infestation and presence of collected extents since 2011. Infestations were quantified using a survey method described by Prather (2006).

Since 2011, sites 1 and 2 have decreased in size by 3,548 m² and 168 m², and have the least amount of overlapping area by 36% and 54% respectively. Sites 3 and 4 have increased in area extents by 790 m² and 336 m² and have the greatest overlapping percentages of 76% and 67% respectively. Due to sites 3 and 4's close geographic proximity, it is suggested that their increase in extent is in response to a lack of mechanical management, or being located in a microclimate of ideal growing conditions. Site 2 was significantly decreased in extent since 2011. In 2013 the Canada thistle was not fully mature to flower stage until late in the growing season, suggesting competition of native grasses becoming established within the infestation. This is also consistent with results of interspecific plant competition from native species plants in grassland communities (Graglia, et al., 2005). However, a location along a man-made berm at site 2, was measured up to 85% cover and had the first flowering plant of the 2013 season of any other site, indicating a well established and a mature infestation. The overlapping area of the berm is 87%, confirming an advanced site. This work gives preliminary results of quantifying Anchorage's Canada thistle infestations, but left us with questions about quantifying densities, the effectiveness of mechanical management and ideal Alaskan growing conditions of Canada thistle.

PROJECT GOALS

- Understand how Canada thistle is behaving in the Anchorage area
- Increase inventory of known infestations and survey for new infestations, both reported by the public and with collaborative agencies
- Contain Canada thistle to the Anchorage area and reduce infestations to background levels
- Work with the public and manage established sites on private property; creating community interest in invasive species



CONCLUSION

- Since 2011, site 1 has decreased in size by 3,548 m² and site 2 by 168 m²
- Site 1 has an overlapping area by 36% and site 2 by 54%
- Site 2's berm has an overlapping area of 87%
- Site 3 has increased in area since 2011 by 790 m² and site 4 by 336 m²
- Site 3 has the greatest overlapping area of 76% and site 4 with an area of 67%

	Area (m ²)	Area difference since 2012	Area difference 2012-2011	Area difference since 2011	Overlapping area (m ²)	Overlapping %
Site 1						
2013	415	181	-349	-168	151	36
2012	234					
2011	583					
Site 2						
2013	978	-3873	325	-3548	529	54
2012	4851					
2011	4526					
Site 3						
2013	4902	1193	-403	790	3709	76
2012	3709					
2011	4112					
Site 4						
2013	2256	105	231	336	1510	67
2012	2151					
2011	1920					

*Note: Negative values indicate a decrease in area

DISCUSSION

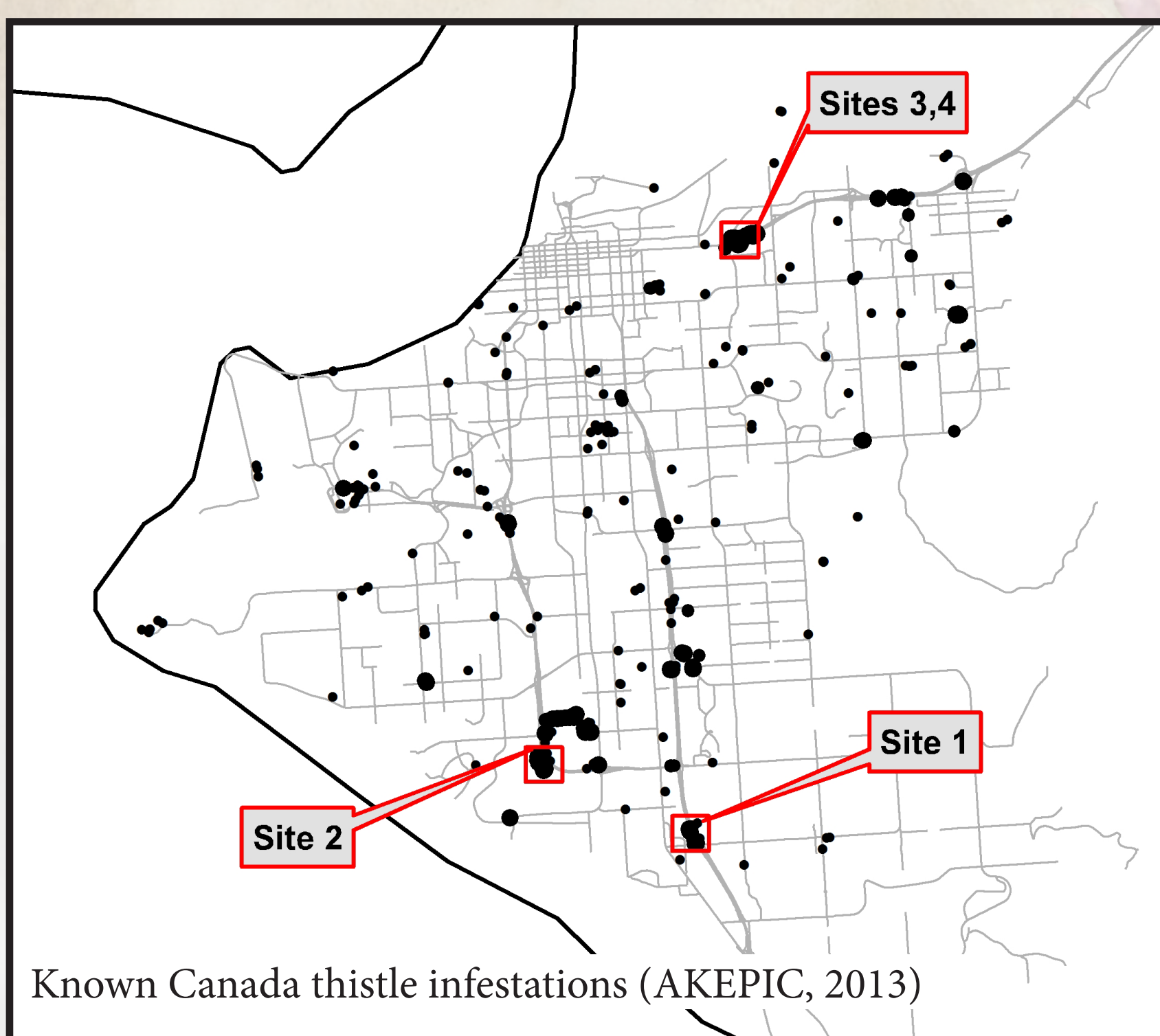
- High percentages of overlapping areas suggest a well-established and mature infestation and should be target areas for control.
- Lower overlapping percentages suggest that infestation site is lacking established stands and dense cover of Canada thistle. Thus, interspecific plant competitions from native species plants are reducing Canada thistle's density and area coverage.
- Area increases are measured up to 7 m from previous years (site 3), indicating rapid growth of rhizomes and occupying new territory year after year.

QUESTIONS

- Should areas of high overlapping percentages be target sites for herbicide applications?
- Is mechanical control on less dense sites reducing the areas of newly established infestations?
- Canada thistle has been estimated to grow up to 5.5 m by rhizomes (Boersma et al., 2006). How much of the newly established areas are a result of new growth or just due to inconsistency of field data collection?

FUTURE WORK AND OUTREACH

- Herbicide treatments of 6 priority sites along Right-of-Ways
- Continuing mechanical management to reduce seed bank and rhizome starches, and investigate the effects on less dense and newly established infestations
- Collaborate with more private property owners in establishing their site-specific management plan

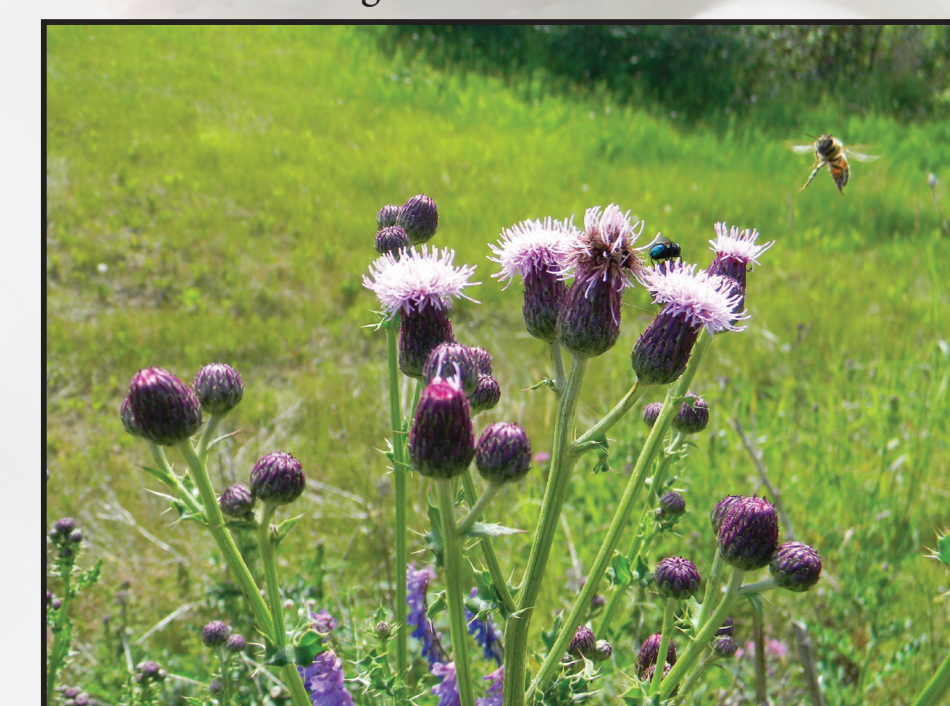


ACKNOWLEDGEMENTS

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Site 4: Habitat along ROW



Site 2: First flowers recorded on 10 July, 2013



Site 2: Mature seeds



Site 1: Consistently mowed along ROW



Site 2: Late season competition with native grass



Site 3: Both purple and rare white flowers

AKEPIC. (2013) "Alaska Exotic Plant Information Clearinghouse." *Alaska Natural Heritage Program*. University of Alaska, Anchorage. Retrieved September 16, 2013 (<http://aknhp.uaa.alaska.edu/maps/akepic/>).

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Prather, T. (2006) "Adaptive Sampling Design." *Inventory and Survey Methods for Nonindigenous Plant Species*. Montana State University Extension. pp. 56-59.

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