

Zooarchaeology of the Native American Sturgeon Fishery in Coastal Oregon, 350 BC to AD 1150

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Introduction

Sturgeon remains are rare in the archaeological record due to their largely cartilaginous skeleton. Consequently, little is known about sturgeon ecology and human influence in the past, particularly along the Northwest Coast of North America (Broughton et al. 2015; Gobalet et al 2004; McKechnie and Moss 2016). Two sturgeon species occur in the Pacific Northwest *Acipenser medirostris* (green) and *Acipenser transmontanus* (white). Historically heavy fishing of the white and by-catch of the green has resulted in the listing of the green as near threatened (IUCN 2016). Because of the white's economic importance and the green's conservation status, knowing about the abundance and uses of sturgeon prior to intensive fishing can provide context for the conservation of Pacific sturgeon. Here we report on our analysis of a large assemblage of archaeological sturgeon bones from the Par-Tee site, a Native American village and shell midden near Seaside, Oregon.



Figure 3: An archaeological example of scute morphological variation. This photograph is an example of the hooked scutes talked about in the conclusion. The bones were taken across scute subgroups and levels.



Figure 4: An archaeological example of scute morphological variation. This photograph is an example of platelets, a group of scutes found in all areas of the body. The bones were taken across scute subgroups and levels.



Figure 1: Green Sturgeon (top).

Figure 2: White Sturgeon (bottom).

Research Questions

1. What sturgeon bone elements are present in the assemblage?
2. Can we determine the species of sturgeon that are present at the site and estimate their size?
3. How are sturgeon remains distributed across space and through time?
4. What, if anything, can this tell us about contemporary sturgeon conservation?

Methods

The Par-Tee site is located on the Oregon Coast south of the Columbia River and dates to 350 BC to AD 1150 (Wellman et al. 2016). Sturgeon bones were part of a zooarchaeological assemblage containing mammals, birds, and other fish. Bones were identified as sturgeon based on their morphology and comparison to modern skeletal reference collections. Counts of sturgeon bones and all other fish bones were kept by provenience. The comparative specimens were used to define individual bones to element and for comparative morphological examination, and bones were grouped based on the regions of the body (Findeis 1996; Thieren et al. 2015).

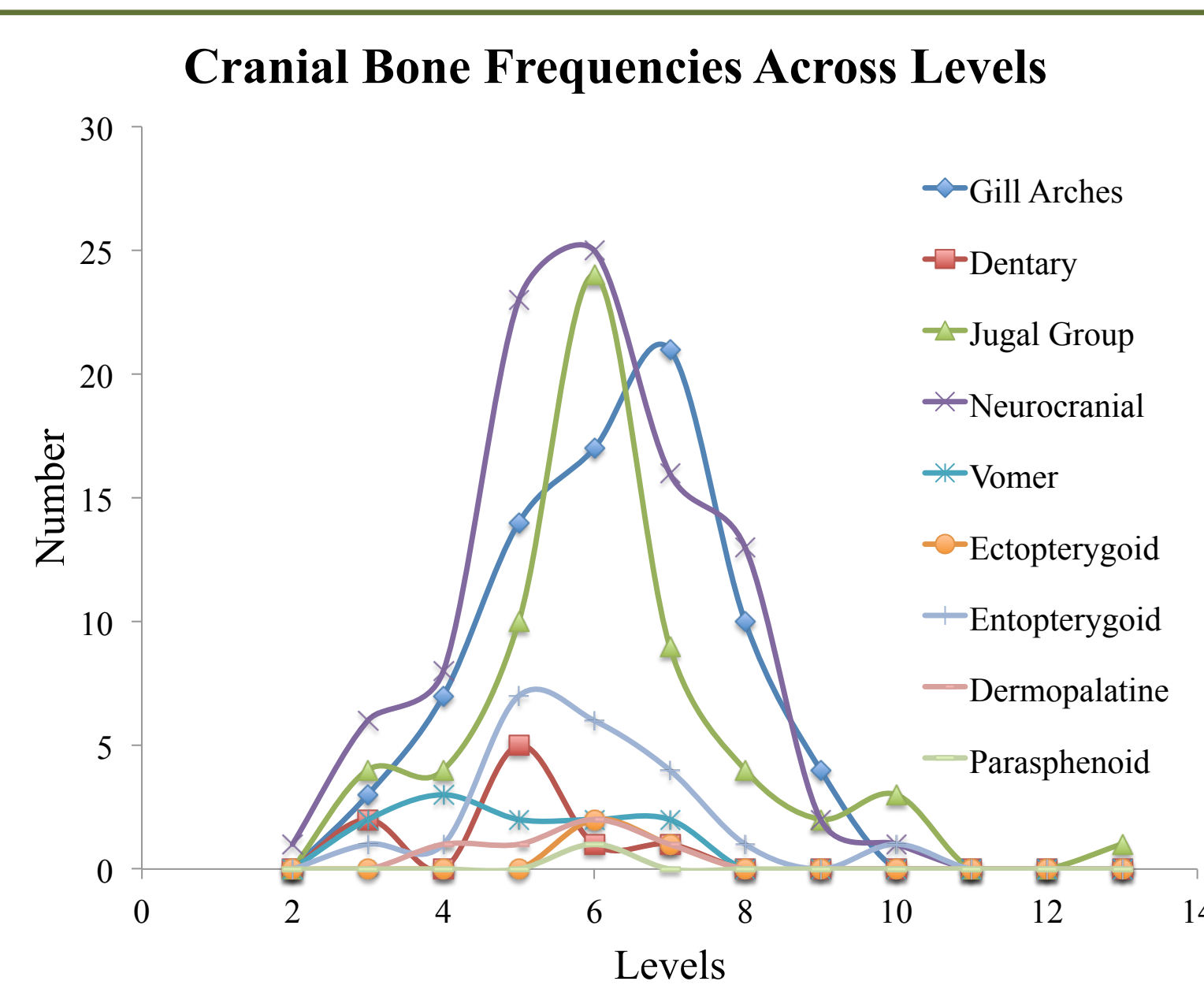


Figure 5: A line graph of the bone abundance per level focusing on the subgroups of the cranium (Left).
Figure 6: A line graph of the bone abundance per level focusing on the subgroups of scutes (Right).

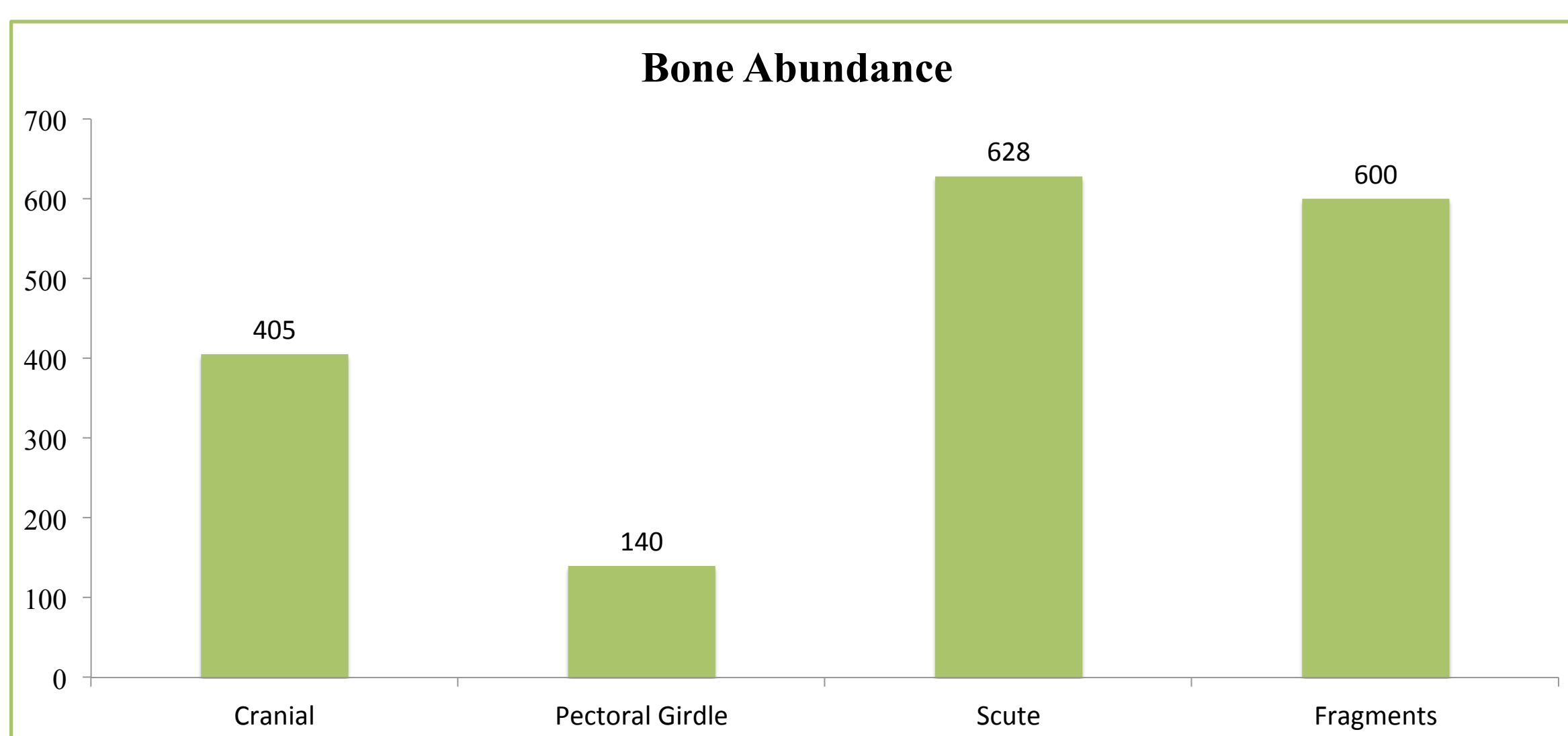
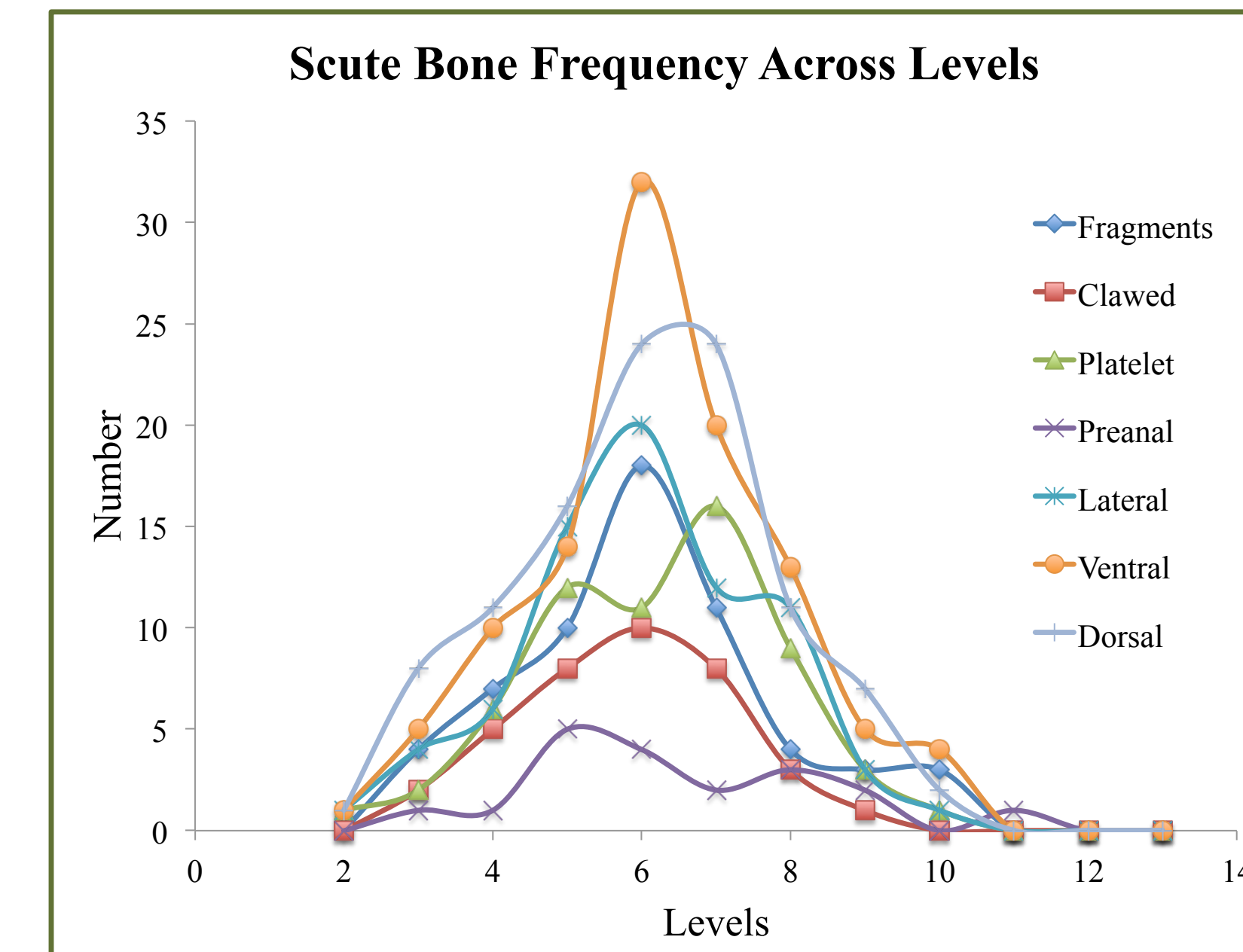


Figure 7: A bar graph depicting the differences in bone abundance across the bone subgroups. Cranial refers to the neurocranium and gill bones whereas the pectoral girdle is referring to the caudal fins and supporting bones. Scutes include platelets.

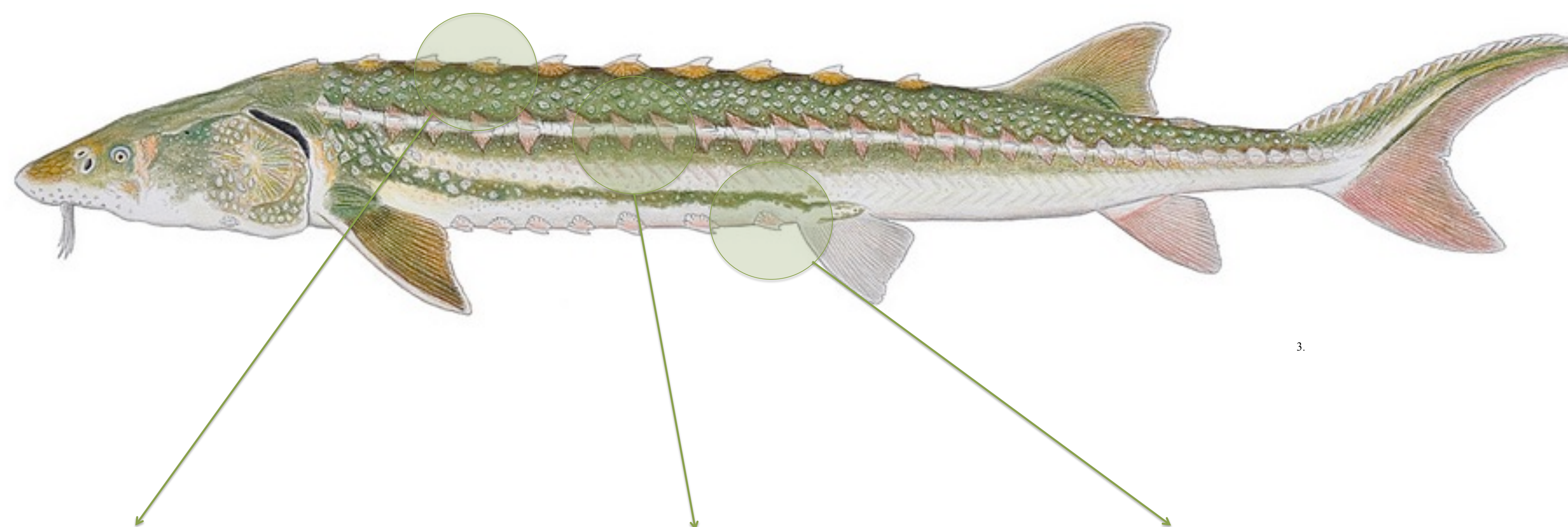


Figure 8: An archaeological example of scute morphological variation. This photograph is an example of dorsal scutes. The bones were taken across scute subgroups and levels.



Figure 9: An archaeological example of scute morphological variation. This photograph is an example of lateral scutes. The bones were taken across scute subgroups and levels.



Figure 10: An archaeological example of scute morphological variation. This photograph is an example of ventral scutes. The bones were taken across scute subgroups and levels.

Conclusion

What sturgeon bone elements are present in the assemblage?

- About 4% of all fish bones from Par-Tee are sturgeon.
- The majority of the bones in the assemblage are fragments, with diagnostic bones consisting largely of scutes and some cranial elements.
- Because a small percentage of sturgeon skeletal anatomy is ossified, sturgeon abundance is likely underestimated compared to other fish, like salmonoids.

Can we determine the species of sturgeon that are present at the site and estimate their size?

- Some minor differences were noted in scute morphology. A small number (~7%) of the scutes analyzed were distinctly hooked in comparison to the majority of scutes present. Questions remain about the attribution of these traits to species (see NOAA 2015).
- We could not estimate size as we had a low proportion of complete cranial bones to use previously reported regression formulae (Broughton et al. 2015, Thieren and Van Neer 2014).

How are sturgeon remains distributed across space and through time?

- Distribution of the sturgeon bone suggests that most elements are found in levels 5-7, which are the densest levels of faunal material at the site.
- Further analysis that will describe the distribution across space is planned.

What, if anything, can this tell us about contemporary sturgeon conservation?

- Archaeological analysis of sturgeon bone can contribute to the understanding of the modern fishery, but preservation and identification issues need to be improved before we can accurately evaluate this question.

Further Research

- Future research will incorporate aDNA species identifications and blind tests with other researchers to confirm which species of sturgeon were present.
- Continuation of this project will aid in assessing how the archaeological assemblage of sturgeon bones compares to present day observations of the fishery.

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