

Introduction and Objectives

- PIT tags consists of a microchip encapsulated in a glass ampule that remains inactive (passive) until read by a scanner (Fig. 1)
- Passive integrated transponder (PIT) tags are identification devices used in many different applications in fish and wildlife research (Figs. 2 & 3)
- Tag sterilization is required for the welfare of the organism and to comply with animal care committees
- Current sterilization methods require expensive chemicals and are time intensive
- PIT tags have not been thought to withstand autoclave sterilization (Wagner et al. 2011)
- Biomark has not tested their tags for durability after autoclaving
- Autoclaving would be a simpler, cheaper, and more accessible form of sterilization if proven viable

OBJECTIVES:

- To test if PIT tags are readable after autoclaving
- To test if read ranges between four different sizes of PIT tags vary after autoclaving



Figure 1. PIT Tags (Photo by Biomark)

Methods and Materials

- We tested 30 PIT tags of four sizes (MiniHPT8 [8 mm], HPT9 [9 mm], MiniHPT10 [10 mm], and APT12 [12 mm])
- We tested readability and measured detection distance twice for each tag both prior to and after autoclaving in field conditions
- We used Biomark's HPR Plus with portable antenna, HPR Lite reader, and the HPR Plus with racket antenna to detect tags
- To determine read range, we used the HPR Plus with portable antenna and the HPR Plus with racket antenna, but only used HPR Lite reader to test detectability (Fig. 4)
- We determined read range by slowly lowering the antenna while sweeping it back and forth until the tag was detected and then measured the distance from tag to antenna
- After initial detection readings, we autoclaved PIT tags in a Sterilink model 533 HC vacuum sterilizer and repeated detection procedures



Figure 4. Using a HPR Lite reader to detect PIT tags in the field



Figure 2. PIT tag being implanted in fish (Photo by Idaho Game and Fish)

Results

Table 1. Mean Read Range Before and After Autoclaving

	8 mm	9 mm	10 mm	12 mm
Pre autoclaving	110.5 mm	157 mm	122 mm	203.2 mm
Post autoclaving	134.5 mm	174.2 mm	155 mm	246.5 mm

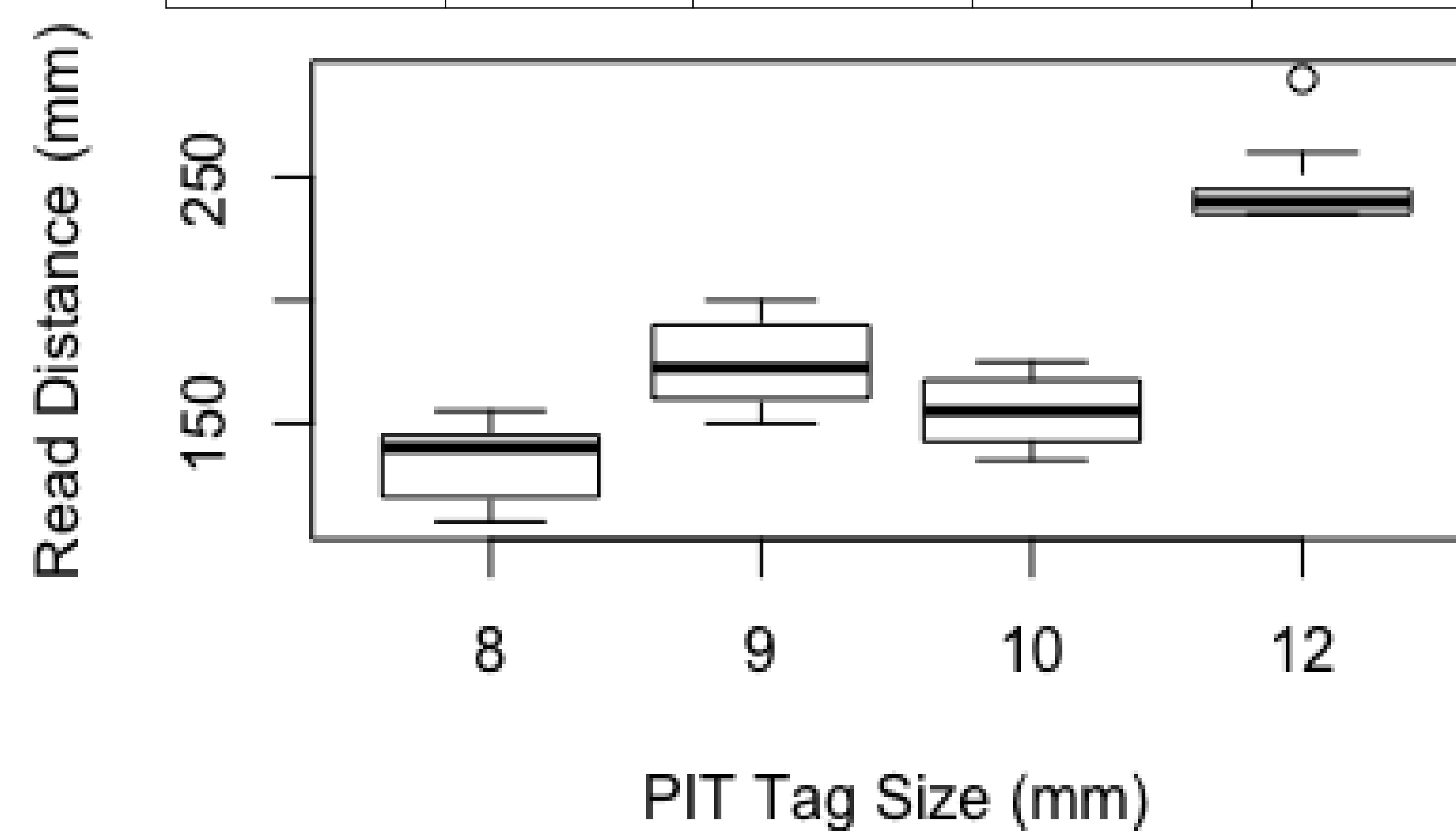


Figure 5. Read Distances with BP Plus Portable Antenna Post Autoclaving

- Autoclaving did not diminish PIT tag detectability (Table 1)
- HPR Lite reader detected all tags pre and post autoclaving
- Size 12 tags were detected at significantly greater distances than all other tags (Fig. 5)

Conclusions and Discussion

- Autoclaving does not alter PIT tag readability or detection distances
- 12 mm PIT tags have significantly greater detection than smaller tags
- If choosing a PIT tag size for a research project, negligible detectability is lost between 8 and 10 mm tags

Future Directions

- Additional studies to examine potential long-term changes in detectability within animals would provide further reliability assurances



Figure 3. PIT tags are used in many organisms, such as snakes (Photo by MN DNR)

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References

Wagner GN, SJ Cooke, RS Brown, KA Deters. 2011 Surgical Implantation Techniques for Electronic Tags in Fish. Reviews in Fish Biology 21:71-81

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