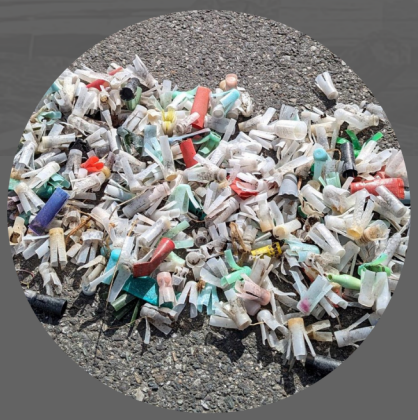
WSU EXTENSION
Island County

CLCP June News

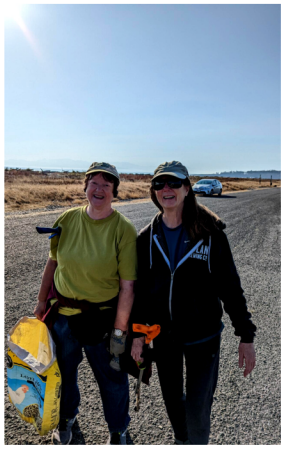


SHOTGUN WADS

The dangers of plastics are well-documented and well-known to those tracking threats to our world, but one source of plastic pollution has gone largely unnoticed until now: shotgun wads.

COMMUNITY LITTER CLEANUP

CLCP is a group of volunteers who help maintain Island County beaches. We not only remove debris, we conduct marine debris surveys and help monitor the shotgun wads collected on the island. Anyone over 18 can join us on the beach. No pre-registration is required; however, you will need a state parking pass for most locations.



WINDJAMMER

Windjammer City Park is the current site of our most voluminous retrieval of shotgun wads. We are looking into the reasons for this as well as solutions.

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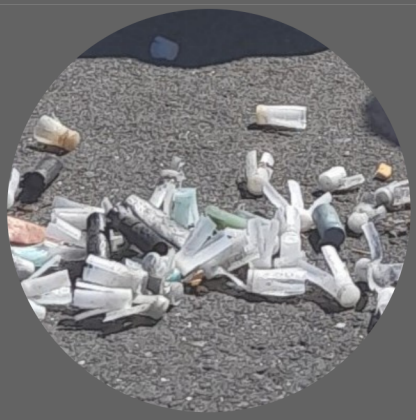
According to the Virginia Institute of Marine Science, billions of shotgun wads are produced domestically every year. Worldwide production has been estimated at 10 to 15 billion wads every year for the last 50 years. Each shotgun wad equals about two grocery shopping bags' worth of plastic. Shotgun wads are particularly troubling because of where they're used—in and around waterways, estuaries, and other places we've chosen to preserve for their natural qualities and ecological importance. Since so many wads wind up in waterways, they naturally drift into bays, rivers, and the ocean like tiny plastic squid. - https://www.yournec.org/the-plastic-problem-of-shotgun-wads/

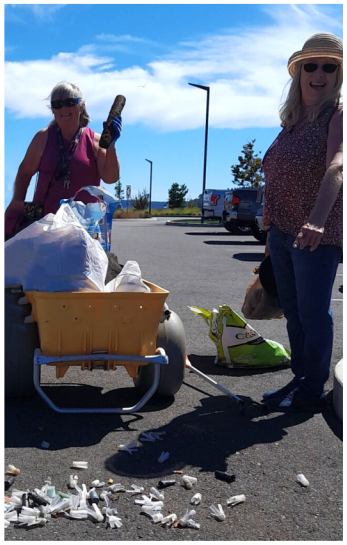


SHOTGUN WADS

Research identified two main behavior change pathways for reducing shotgun wad debris:
1) reduce plastic wad prevalence through wad retrieval, and
2) transition to biodegradable ammunition

WHAT CAN WE DO?

We can promote and purchase biowads, Here in the United States, Fiocchi and B&P have recently started manufacturing 12-gauge shotgun shells that use biodegradable wads. Their blog claims that their biopolymers "100% biodegrade" on a Go Green and Go Premium campaign"
https://fiocchi.com/en/blog/post/fiocchi-group-launches-green-core-range-components-biodegradable-materials



BEACH CLEANUPS

Every trip we make takes more shotgun wads off the shore and away from animals. Making a difference, even in a small way, is vital and urgent work.

Fact Sheet
Biodegradable PHA Shotgun Wads

Researchers at the Virginia Institute of Marine Science, College of William & Mary have been working on solutions to plastic pollution affecting the marine environment. Plastic shotgun wads have become a common marine debris item collected during beach cleanups. "Wad" refers to a component of a shotgun shell that is used to separate the shot (pellets) from the powder. While the shotgun shell or casing is ejected near the shotgun and is easily retrieved, the wad is fired out of the barrel along with the pellets and is very difficult to recover (Fig 1). Hunters generally recover spent shells or casings but, due to the range of shotguns, there is no practical way to recover the spent non-degradable plastic shotgun wads.

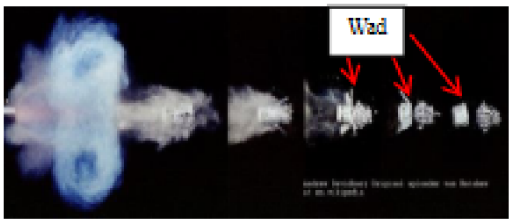


Figure 1. High speed photography of standard plastic wad.

Spent plastic shotgun wads can present safety, nuisance, and environmental impacts in freshwater and estuarine waters (Fig. 2). When sportsmen hunt for waterfowl using shotguns, the plastic wads are lost into the adjoining water or marshland and can enter the food web as non-degradable plastic debris. The consumption of plastic compromises fitness and can harm aquatic species. Plastic wads have been found in the stomachs of ocean foraging birds, including albatross presumably due to their resemblance to squid, a common food item (Fig 3). Over time the spent plastic wads can fragment into smaller and smaller microplastic pieces. Microplastic fragments have become a significant marine debris concern worldwide. Once microplastics enter the aquatic environment, their buoyancy, size, and longevity within the water column can affect the food web. Studies have shown uptake of microplastics by worms, mussels, crabs, and fish[1,2]. This is important because plastics can concentrate toxic pollutants which can be transferred up the food web.


Figure 2. Plastic shotgun wads from beach cleanups.

VIMS researchers are developing a completely biodegradable and sustainable shotgun wad that has the same functional characteristics of plastic wads but completely biodegrades*. The wad is made of polyhydroxyalkanoate (PHA) which is naturally produced by bacteria and is already present in aquatic environments. Bacteria produce PHA as a small granule to store energy, similar to humans storing energy as fat. When PHA comes into contact with aquatic environments, the resident bacteria recognize PHA as a food source and consume it. PHA meets the American Society of Testing and Materials certification as biodegradable in aquatic environments, European Standards and Vincotte International certification for biodegradation[3], as well as the US Food and Drug Administration standards for use in food contact, housewares, cosmetics, and medical packaging. PHA has also been approved in medical applications such as sutures and drug delivery (pills).


Figure 3. Image of squid and spent shotgun wads.

Plastic shotgun wad production is in the billions annually and in the US over 3 million hunters self-identify as waterfowl hunters. Waterfowl hunters are among the most environmentally astute sportsmen and recognize the importance conservation. Biodegradable wads have importance beyond waterfowl hunting and should be used any time a shot is discharged adjacent to or over water or where the wad could be washed into a stream, river, or bay. This could occur in numerous situations including when hunting animals other than waterfowl, at skeet shooting ranges, conducting military training operations, or sport shooting recreationally off of vessels. The military also uses huge quantities of shotgun shells and has expressed interest in developing environmentally friendly alternatives that leave no trace in theaters of action (Fig. 4).


Figure 4. Sailors shooting 12 gauge shotguns off aircraft carrier USS Ronald Reagan. US NAVY PHOTO.

A grant from the Center for Innovative Technology's Commonwealth Research Commercialization Fund (CRCF) program has provided support to continue testing of biodegradable wads. The CRCF advances science- and technology-based research, development, and commercialization to drive economic growth in Virginia by assisting organizations within the Commonwealth in commercializing qualified research or technologies.

[1] Fendal, L.S. and M.A. Sewell, 2009, Marine Pollution bulletin 58: 1225-1228.
[2] Farrell, P. and K. Nelson, 2013, Environmental Pollution 177: 1-3.
[3] Chanprateep, S. 2010, Journal of Bioscience and Bioengineering 110(6): 621-632.

* The College of William & Mary has filed a patent application covering PHA wads and, in accordance with university policy, researchers share in any net revenues.

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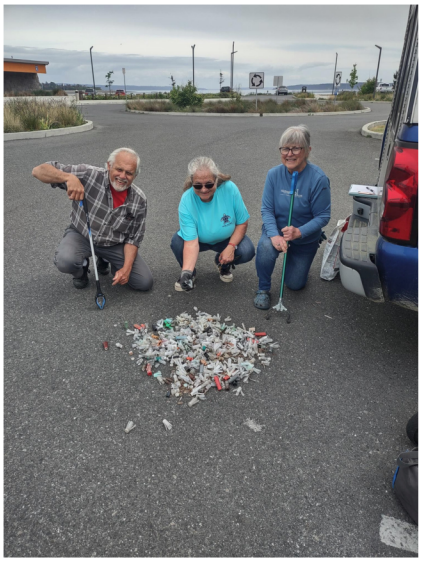

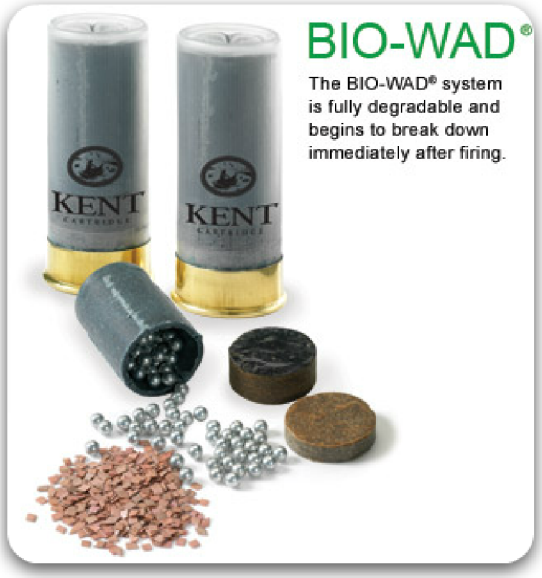

Just in the year that I have worked with WSU Extension, I have seen the shotgun wad issue become more prominent on our shorelines. There are only two ways to solve the problem: beach cleanups and biodegradable wad usage. That's it. This is because retrieving a dispensed wad is very difficult, they fly long distances and often over water. The most conscientious hunter will have issues finding them. It is only when they finally reach the shore on a high tide that they can be picked up.

However, those who give of their time to maintain beaches are concerned and weary, tired of thinking an endless task always awaits. Enter the biowad. The biodegradable wad solution is quietly making its way to the states from abroad. But, will island county hunters try the new biowad? Will they accept it and use it?

These questions and more remain our focus today. **For all of you out there cleaning beaches, what are your thoughts? How do you see the issue and from which perspective? I would love to know.** Please send in your thoughts regarding biowads, or any other beach debris topic, and we can get a great discussion going!

DEPARTMENT OF ECOLOGY
State of Washington

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The Purple Card

CLCP offers a program to Island County individuals and organizations concerned with the environment and looking for volunteer opportunities. Individuals and groups can choose public or private beaches in the county that need attention.

CLCP will provide gloves, litter bags, long handled grabbers for easy pickup and safety instruction for the participants if requested.

Each participating person or organization can decide when and how often to organize litter cleanup events. You may choose to do a one-time cleanup or adopt a section of beach for regular attention. Your participation is scalable and you are not under any obligation to continue.

What you get-
• All gloves, bags and equipment necessary for your litter collection outing are provided at no cost to you
• The cost of disposing of your beach litter at any of the four Island County Solid Waste Transfer Stations is covered
• Instruction on beach safety and safe handling of items found on the beach if requested
• A complete volunteer package. Just add people!

AS PART OF THE AGREEMENT, PURPLE CARD PARTICIPANTS ARE REQUIRED TO REPORT THEIR LITTER COLLECTION IN AN ONLINE SPREADSHEET.

BEACH CLEANUP SCHEDULE

May 30 @ Keystone Spit East
10-12
June 6 @ Admirals Cove Beach Club
12-2
June 13 @ Fort Casey
10-12
June 20 @ Double Bluff
1-3
June 27 @ Windjammer City Park
1-3
July 5 @ Double Bluff
1-3
July 11 @ Ebey's Landing
10-12
July 18 @ Keystone Spit West
10-12
July 25 @ Deception Pass
1-3
August 1 @ Windjammer City Park
1-3