

Low-Cost Sustainability Efforts from a Zookeeper's Perspective

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Zookeepers perform many important roles beyond their traditional tasks of taking care of animals. Our traditional role is to care for animals, with a purposeful focus in preserving genetic diversity and healthy breeding patterns for their species. We also contribute to the overall conservation movement by educating the public on habitat loss and factors that are leading to endangering species, and we assist patrons in making personal connections with the animals at the zoo. These are major contributions to the overall wildlife conservation movement in zoos, but what is the environmental cost of caring for these animals? As we know, it takes time and effort of course, but unfortunately, it takes a lot of energy, natural resources, and financial support to provide the quality of management the animals deserve. We are in the conservation field, and we should all strive to reduce our use of resources where we can.



Photo 1: Water Flow Meter Set Up (Photo Taken and Edited by Chelsea Vabro)

There is great joy and pride in caring for animals, but sometimes I feel myself having a lack of choice when it comes to helping conserve the resources I use in my daily work. We all want animals to have safe and clean environments, but how can we do this in a way that isn't wasteful? According to the Oregon Zoo, "nearly nine million tons of plastic enters the ocean each year (two million pounds per hour), and this amount is expected to double by 2025" (Oregon Zoo.org, 2023). In an effort to integrate sustainability into retail and food service operations, over 40 AZA facilities have partnered with Service Systems Associates (SSA), an external commercial company (Richard, 2020). This is a great option for sustainability outside of animal care operations, but what about within animal care? Knowing how detrimental plastic can be on wildlife, the amount of plastic gloves I've thrown in the trash or the amount of freshwater I've sent down



Photo 2: Original Nozzle (Photo Taken and Edited by Chelsea Vabro)



Photo 3: New Jet Nozzle (Photo Taken and Edited by Chelsea Vabro)



Photo 4: New Switch Nozzle (Photo Taken and Edited by Chelsea Vabro)

the drain while cleaning felt troubling. These are necessary wastes that help keep ourselves and the animals safe. I wanted to challenge myself to try and think outside of the box when it came to alternative ways of providing the same standard of care in a less wasteful way. Some impactful ways zoos are increasing sustainability are through reducing greenhouse gas emissions, utilizing renewable energy resources on and off-site, and updating and maintaining green buildings on zoo grounds (*Resources for Greening Business Practices*, 2023). Unfortunately, most of these efforts come with hefty financial investments. One low-cost opportunity for many zoos is to utilize composting as an alternative to landfills. This can include human and animal food waste, as well as fecal waste from animals other than primate species. Composting is not always an option for some of the more urban or landlocked zoos, but connecting with an off-site composting company in your area can be a great alternative.

Another great way to improve zoo sustainability is by looking at the ways your facility currently operates. Zoo and aquarium green teams can be great resources for conducting energy, waste, or water audits, to gain insight into where there is room for improvement.

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This was my approach when evaluating natural resource waste in my daily zookeeper duties. I wanted to improve sustainability while being cost-effective and obtainable from a zookeeper position. I focused on the tools I was using for cleaning operations and was curious about the water pressure from the hoses, or lack thereof. Using a higher water pressure could help improve the

Animal Habitat	Average Operations Liters (Gallons)	With Brass Nozzles Liters (Gallons)
A-Habitat	283.1 (74.8)	199.9 (52.8)
B-Habitat	130.6 (34.5)	74.2 (19.6)
C-Habitat	340.3 (89.9)	182.1 (48.1)
D-Habitat	91.2 (24.1)	48.8 (12.9)
E-Habitat	45.4 (12)	40.9 (10.8)

Table 1: Average Water Used When Cleaning (Data)

efficiency of the water I was using for cleaning, and by increasing pressure, I could waste less water.

I asked permission from my curator to perform a two-month study comparing the water usage of cleaning with a typical nozzle and a high-impact nozzle. We attached a simple water flow meter to the main hose. The meter used was SAVE A DROP P3 Water Flow Meter. It was purchased online from Amazon.com and was about \$17. We tracked the water usage of one keeper who cleaned the same cage for both parts of the study. All other keepers in the department rotated run assignments.

After completing the “control” measurements of how much water was being used, the original switch nozzle was removed and replaced with two nozzle attachments, the HQMPC Super Heavy Duty ¼-inch Shut Off Valve and the Nysist Solid Brass Hose Jet Nozzle (2”L x 1.23”W x 1.25”H). The nozzles were purchased online from Amazon.com and the cost was about \$30 for the two attachments. These nozzles were chosen based on price and material. Although both switch nozzles have ball valves inside, the original one was made of plastic and seemed to break down from wear and tear quicker than the updated one made of brass. The measurements were averaged and compared, shown in Table 1.

We found that the amount of water used while cleaning was reduced by approximately 50% after using the brass switch nozzle and brass jet nozzle. I found the results of this study were very uplifting. The idea that for \$30 I could help reduce the amount of water being used while I cleaned, and still properly care for the animals allowed me to feel ownership of my actions.



Photo 5: DIY Hose Nozzle Keychain (Photo Taken and Edited by Chelsea Vabro)

This is a fairly low cost for reducing the use of water being used, although I do understand that \$30 per hose in a zoo can add up very quickly. At a previous zoo I worked for, each keeper carried their own set of nozzles on their key ring, to help reduce the overall cost. Photo 5 is a photo of a DIY hose nozzle keychain, made from a plastic hose repair kit. This could be another option for reducing the overall cost of purchasing these types of nozzles.

The idea of using a power nozzle while cleaning is not a new concept. However, it reminds us to look at what tools we are using, and consider if there is a small change that can make a big difference. I evaluated a situation and opted to try something different. I did not have to wait for a work order to go through or wait for approval to be made at multiple levels. This was a simple solution to help improve sustainability

operations. I would like to encourage us, as zookeepers, to continue to evaluate how we are operating and what tools we are using. There are many ways to help reduce waste, and not all options have to be high cost to make a big impact. 🐘

References

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