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## Dine and Dash: Changing Harbor Seal Numbers and Habitat Use at the Developing Bellingham Waterfront

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Holland Conwell

## Four Transformative Years in the Marine Mammal Ecology Lab

Dread hung in the spring air of 2019 as I stared down the barrel of a decision that would define the next four years of my life. At the close of my senior year of high school, I found myself wracked with indecision about whether I should choose to attend University of Washington (UW) Seattle or Western Washington University (WWU). UW Seattle was a tough competitor to beat, flexing its global prestige and renowned cherry trees. But while WWU may have lacked an internationally recognized name, it made up for it in beauty and educational commitment—a friendly, deer-ridden campus situated between the bay and the mountains with a strong reputation for valuing its undergraduate students. What ultimately tipped the balance? WWU’s Marine Mammal Ecology Lab.

I happened across the lab’s website before I began my journey at WWU, and immediately, visions of seals danced in my head (or rather, swam around in my head). I assumed that should I ever get the opportunity to join the lab as a research assistant, it would certainly be in my upperclassmen years after I had solidified myself in the biology department and taken a few marine science courses. Little did I know that fate had another path in store. As the tale goes, I first bumped into my current research advisor, Dr. Alejandro Acevedo-Gutiérrez, in September 2019 on a Washington State ferry right before the start of my freshman year at WWU. I was on a trip to the Whale Museum on San Juan Island during my introduction to the Honors Program, and I immediately recognized Alejandro from the Marine Mammal Ecology Lab website. Despite feeling intimidated, I struck up a conversation with Alejandro about his research and my interest in marine science. If I hadn’t seized that very moment, it might have been several more years until I joined the lab, but this conversation is truly what launched my next four years in the Marine Mammal Ecology Lab. Alejandro kindly talked with me about his research and invited me to send him an email reiterating my interest in a research assistant position. With a stroke of luck, I was immediately recruited by Helen Krueger, a former undergraduate lab manager, on Day One of my freshman year.

Since I started in the Marine Mammal Ecology Lab so early on, I got to experience many of its seasons. Graduate students came and went, the lab moved locations, and our team grew exponentially over four years. I saw firsthand how this lab is shaped by its people, each bringing something to the table that heavily impacted my growth and how the lab itself grew and changed. I started as a field assistant for the Log Pond project (one of two long-term field projects in the lab) and was tasked with collecting data on harbor seal numbers and environmental changes at an active construction site in downtown Bellingham. I spent a glorious six months, pre-pandemic, simultaneously reveling in my weekly wildlife observations and wrestling with how intimidated I felt in the lab. At lab meetings, I was hyper-aware that I was the only freshman in a room of upperclassmen and graduate students, and it took some time for me to find my voice. My

fieldwork came to an unexpected intermission in March 2020, and I waited at bay while we struggled to regroup and adapt to life and lab work in the face of a raging pandemic.

In summer 2020, Kyra Bankhead took over as the new undergraduate manager of the Log Pond project. Kyra became a key part of my growth from a research assistant to, ultimately, a lab manager. (I even had the recent opportunity to check in with her post-graduation, hear some advice about graduate school, and take a tour of her lab at Hatfield Marine Station in Newport, Oregon.) With Kyra at the helm, the Log Pond project resumed and expanded to taking noise readings in the field, helping to expand my own field skillset. In October 2020, I experienced my second key stroke of luck when the other long-term field project in the lab, the Whatcom Creek project, started recruiting field team members from within the lab after the pandemic shake-up. The leap from the Log Pond to Whatcom Creek was thrilling, as I soon became accustomed to the action-packed, social field work that this project had to offer. Whatcom Creek was a magical place during the fall salmon run, and I learned the art of fast-paced data collection, photography, and field communication while tracking hungry seals and the occasional California sea lion. But the rush of juggling equipment with a creek full of seals and crowds of pedestrians cheering the salmon on as they struggled upstream quieted into a hushed, frosty winter at the creek. Although I spent many hours shivering alongside my field partners with no seals in sight, the memories made at the creek that winter are still so dear to me. This was smack-dab in the middle of the pandemic, during an intense time of social isolation without a publicly available vaccine. Because of this, the only opportunities I had that year to meet and talk with other students ended up being at those Whatcom Creek observations. Every week, I looked forward to standing in the cold with my lab mates and learning their life stories through chilly, creek-side conversations.

When spring 2021 rolled around, graduate student Zoë Lewis recruited me for my first stint at the lab bench. (Before that, my only lab experience, due to online class labs, amounted to computer simulations of pipetting.) I spent the next six months glove-deep in sea lion scat and was so grateful to Zoë for taking me under her wing, trusting me to assist her graduate thesis, and for teaching me valuable lessons in the lab. That spring I also received an exciting invitation to collaborate with Alejandro and Dr. Dietmar Schwarz, my other research advisor, to conduct data analysis for a project on the sex-specific diet of harbor seals in the Salish Sea. This felt like a massive leap at the time since I had yet to even take biostatistics or receive an introduction to RStudio, a software program used in statistical analysis. I also had yet to work so independently in the lab and was terrified that I would not measure up to expectations. This season of my time in the lab was truly one of grit and ultimately growth. I doubled up on biostatistics and genetics courses in the spring but still felt like I lacked the biological background and vernacular to succeed at analyzing the data at hand and writing a manuscript. However, I was determined to not let such a golden opportunity slip through my fingers. I began my journey with an extensive literary search and eventually penned the first drafts of my introduction and methods, which have since gone through a massive transformation. I then spent months upon months grappling with data-cleaning in Excel and RStudio, slowly but surely strengthening my knowledge of the software packages and functionality at my fingertips. With endless support and patience from my co-mentors, I began churning out figures and increasing in confidence.

At this point, I had completely transitioned out of the field and lab and instead spent my days resolving endless error codes in RStudio. I surged forward in my data analysis efforts, presented posters at research conferences for the first time, received funding to continue my research full time over the summer, and was appointed the next manager of the Log Pond project by Kyra upon her graduation from the university. As enthusiastic as I was to be moving up in the lab, I also had a nervous feeling in the pit of my stomach. For the first time, people were looking to me for the answers to their questions and relying on me to keep a large project running as smoothly as it had been for the last 16 years. Amidst my worries and apprehension, I learned quickly that if I wanted anything to get done, I needed to start trusting myself. I needed to fall back on my years in the lab and have faith in my own abilities to manage a project and support a field team. As I leaned into my new role and started gaining a new sense of confidence, leadership, and seniority, I felt my identity shift in the lab. All of a sudden, I was carrying a brand-new set of responsibilities and facing unfamiliar challenges in supervising a team of people. I started to seek solace in and truly bond with the other undergraduate managers in the lab, strengthening my connection to the lab and its people. As my senior year took shape, I watched the dawn of a new and fruitful season in the lab: one of collaboration, community, and creativity. I believe that this shift was greatly due to the combined efforts of Victoria and Alexandria, the graduate students running the show during my final year in the lab.

At last, all lab operations had returned to in-person, allowing the managers to dream big about the new academic year. We set aside time every week to come together and talk about our projects, problem-solve as a team, and plan special activities and opportunities for the students in the lab. We hosted lab meetings all year long and created a space for students to learn more about research, marine science, and career paths, arranging everything from a Halloween cookie-decorating event to a crash course in ArcGIS. Victoria and Alexandria offered bountiful opportunities for students to become more involved in their lab work and dedicated themselves endlessly to ensuring that students got as much as they possibly could out of their lab experience. During my time managing the Log Pond project, I collaborated with the Whatcom Creek team and eventually had almost half of my students enthusiastically working on both long-term field projects. As I had once cherished being a hybrid field assistant working for both field projects, I had a gut feeling that bridging the divide between the Log Pond and Whatcom Creek projects would offer so much to other ambitious and interested students. Now as my time in the Marine Mammal Ecology Lab draws to a close, I see so many students taking advantage of the many opportunities we have worked so hard to provide this last year, emerging as more versatile, confident scientists.

My freshman year, I started on the Log Pond project as a timid field assistant with big dreams but few skills. Four years later, I found myself running that same project with a team of 10 field assistants. In those years, I gained a great deal of experience out in the field and in the lab, poured countless hours into RStudio, and even have a technical manuscript in the works for journal publication. I helped run lab meetings where I used to feel so shy. Though I began my lab work four years ago feeling insignificant and out of place, I now truly believe I belong, collaborating and leaning on a sweet and supportive group of scientists.

Stepping into the role of managing the Log Pond project offered me the opportunity to conduct an independent research project once again in the lab. In many ways, it felt like my last four years and all my growth and progress had led to this very project. After spending four years gaining new experiences and skills, I approached my final project with a decked-out scientific toolkit. I chose to analyze and compare long-term harbor seal numbers and habitat use at the Log Pond, the Pier (adjacent to the Log Pond), and Whatcom Creek. This project tied in my time spent counting seal heads and wielding a camera at Whatcom Creek and my years watching the transformation of seal habitat at the Log Pond. To conceptualize this project, I thought back to the beginning stages of my project on harbor seal diet and all that I have learned since. In conducting data analysis, I pulled on my simultaneously frustrating and euphoric journey through linear modeling in RStudio. To give my honors capstone presentation, I put on the brave voice I developed during student poster presentations while attempting to hide my sweaty palms. Every piece of my journey and every person who supported me along the way led to this final project and my ability to do it justice.

The sun is officially setting on my time in the lab and at WWU, but the lab will continue to pass from season to season, and the Log Pond project will endure in the care of another, as it has for 16 years. I look back on my time in the lab with sheer gratefulness that I was present for this dynamic snapshot in time and afforded so many invaluable opportunities as an undergraduate student. I found my voice, my confidence, my passion, and my community in this lab, and I am forever changed because of it.