

## ***Sounds in Nature: Why they matter to Alaskans and how they are measured***

The world of sounds and soundscapes are explored in this free virtual workshop intended for the public. Presenters will cover the breadth of sounds in nature as a discipline, from the appreciation and ecological significance of sounds, to how they are measured and managed, and finally to how human-generated noise can disturb Alaskan wildlife. The workshop is co-hosted by the Anchorage Museum, Alaska Quiet Rights Coalition, Alaska Wildlife Alliance, and the National Park Service.

**WHEN: February 6, 1-4 pm**

**Opening (5 min):** Brian Okonek

*Brian has been on the Alaska Quiet Rights Coalition board since 2007 and has served as president for the past 8 years. AQRC has been dedicated, since its' founding in 1996, to protecting the rights of Alaskans to quiet places for the benefit of public land users.*

Presenters (~25 minutes each)

### **Ecoacoustics Theory and Soundscape Ecology in Alaska's Wilderness**

Sound in nature is a form of information vital to the functioning of ecological systems that also impacts human experience. The significance of sound is based on a scale of emergent properties ranging from the way animals select habitats based on acoustic qualities to landscape-level patterns of acoustic compositions linked to the physical environment and human activity. Biophony, geophony, and natural quiet are unique components of Alaska's wilderness soundscapes that attract millions of people worldwide seeking to experience nature in its purest form. Yet, human access to these wild areas is largely by means of machines, which create noise (technophony), ultimately diminishing wilderness quality and human experience of natural sounds. Dr. Mullet will introduce the theories and concepts of ecoacoustics and present examples on how natural and human-made sounds interact in the context of Alaska's wilderness landscapes.

*Dr. Timothy Mullet is the Ecologist for Kenai Fjords National Park. Tim has focused his work on soundscape ecology for nearly 10 years with an emphasis on ecological patterns, wilderness character, and human disturbance. His published works range from the award-winning Acoustic Habitat Hypothesis to evaluating the impacts of noise to wilderness character on the Kenai Peninsula using ecoacoustics theory. He lives happily nestled among the coastal mountains in Seward, Alaska with his wife Amanda.*

### **A Civic Perspective on Sound in Alaska**

Let us take a moment to celebrate Alaska's remarkable heritage of natural sound and quiet. In doing so, we also refresh our civic understanding. This talk will show how to "read" basic graphs of sound, how to understand summaries of sound (by noting what they leave out), and touch on the importance of spatial scale when predicting noise from of human activity. We'll trace the words of author Emily Thompson when she said, "the soundscape is simultaneously a physical environment and a way of perceiving that environment; it is both a world and a culture constructed to make sense of that world."

*Davyd Halyn Betchkal is an acoustician with the National Park Service Natural Sounds and Night Skies Division. Since 2009, Davyd has served our Alaskan parks by documenting landscapes of solitude and quiet as entwined with their history of human passage. This year Davyd is the recipient of the NPS Regional Director's Award for Professional Excellence in Natural Resource Stewardship, underscoring dedication to creativity, computation and understanding systems.*

### **Cultivating a Sound Practice**

The Anchorage Museum started a multiyear sound project in 2018 to collect and investigate the different soundscape throughout Alaska. Through this project the museum has created a robust sound collection that has helped support the creation of programs and curriculum that utilize natural sound as the primary focus. This talk will examine some of the material created through this project with a key focus on examining the process of learning to hone one's sense of hearing to better experience the natural soundscapes of Alaska. We will discuss how sounds can reveal the character of a place and shape our connection and understanding to our physical surroundings.

*Erin R. Marbarger is the Science and Innovation Education Manager at the Anchorage Museum, a position that develops innovative Science programming for diverse audiences and manages CoLab, a creative collaboration laboratory that helps kids and families learn about innovation and citizen science in the North. Erin holds a BA in Environmental Studies with an emphasis in Natural Resource Management from the University of Colorado and a MS in Environmental Studies with an emphasis in Environmental Education from Antioch University New England. Erin has over 10 years' experience in informal education with a focus in outdoor and environmental education.*

### **Underwater Sound and Marine Mammals in Alaska**

Marine mammals and cetaceans in particular use sound as their primary sensory modality. Sound is more important than vision for these species. The unique properties of water make sound a very efficient mechanism to transfer information in the marine environment, thus, natural selection has shaped cetaceans as highly specialized acoustic transmitters and receivers. The good news about this particularity is that we can use sound to monitor these species, and this becomes especially useful for remote or challenging areas such as Alaskan waters. The bad news is that human generated noise highly interferes with marine mammal communication and sensing, and almost all human activities occurring in the ocean cause noise in their habitats. This presentation will describe common methods to acoustically monitor Alaskan marine mammals, and will try to convince you of the importance of sound for these species and how human generated noise is disrupting their acoustic environment.

*Dr. Manuel Castellote is a behavioral ecologist working for the University of Washington and the Marine Mammal Laboratory at the NOAA's Alaska Fisheries Science Center. His work focuses on researching the effects of human noise on cetaceans and using sound to monitor seasonal presence and behavior. He is also involved in underwater noise regulation and noise impact mitigation in Europe and the USA. Some of his past work in Spain described fin whale population structure in the Mediterranean Sea and North-East Atlantic Ocean based on song characteristics to help strengthen conservation measures, and developed passive acoustic methods to monitor bottlenose dolphins in marine protected areas to reduce disturbance by recreational activities. His recent work has been focused in Alaskan waters. He has described increased presence of killer whales in Kotzebue Sound likely related to a sustained reduction of the ice season, year-round occurrence of a cryptic and largely unknown population of beluga whales in Yakutat, and he is currently evaluating the impact of human generated noise on the endangered and declining Cook Inlet beluga whale population.*

## **Effects of Noise and Other Human Disturbance on Wildlife**

Anthropogenic sounds (noise) and other human stressors elicit stress in wildlife. Acute stress is most often manifested as the classic fight or flight response, but chronic stress may increase metabolic rates or trigger endocrine changes even without overt behavioral changes. It is often difficult to separate sound or noise from its source except when it is so damaging that physiological damage occurs, such as increased stranding of whales and dolphins after marine seismic testing or hearing damage caused by sonic booms from military aircraft. Consider that a rabbit can feed on an airport greenway surrounded by the noise of departing jets, but the whispering wings of an owl can set the same rabbit running for cover. The response is essentially based on a rapid risk assessment, conditioned by the type, magnitude, and duration of the stimuli; species-specific tolerance, breeding status of the individual; food availability; prior experience; and the likelihood of escape. Examples of common disturbances in Alaska on our local wildlife are presented.

*Dr. John Morton has studied and managed human disturbance of wildlife over 4 decades as a wildlife biologist with the U.S. Fish and Wildlife Service. He was most recently the supervisory biologist at Kenai National Wildlife Refuge. Previously, he helped show that commercial oil and gas development would likely reduce fat gain in snow geese staging on Arctic NWR. His MS thesis attributed daily movements of American black ducks to human activities in saltmarshes surrounding Chincoteague NWR. John's doctoral research attributed the abundance and distribution of sanderlings wintering on Assateague Island National Seashore to beach recreation. He showed naval aircraft training likely affected the distribution and behaviors of the endangered Mariana crow on northern Guam. John is now on the boards of the Alaska Wildlife Alliance and Alaska Quiet Rights Coalition.*

**Panel Discussion** (~30 min): All participants