Final Abstract:

Coyotes (Canis latrans) have coexisted with humans in Colorado for millennia, and with remarkable adaptability to anthropogenic changes. Coyotes shape ecosystems by balancing populations of rodents, ungulates, and mesocarnivores, enhancing bird diversity, disease control, and plant diversity. Despite their elusive nature, coyotes use human trails for easy travel and olfactory communication. A study led by CU PhD candidate Emily Golden Beam and ENVS professor Joanna Lambert investigates coyote behavior through scat analysis from Boulder County Open Spaces. Samples are analyzed in the lab to learn about coyote gut microbiome, parasite load, hormone levels, and diet. Data can provide insights into how people and the environment may shape coyote behavior, and how we can improve human coyote coexistence. From May 21 - July 16, 2024, two researchers collected nine samples from various trails. Finding fresh scat (1-4 days old) is necessary for viable DNA and microbiome analysis and is rare. It required about 6.33 hrs and 12 km to find one scat. With 155 miles of trails in Boulder County Open Spaces and nearly two million annual visitors, there's a promising opportunity to engage trail users as citizen scientists to report scat sightings. Public participation in open science enhances scientific engagement and data collection through crowdsourcing. More eyes on the trails increase the chances of locating scat samples, leading to deeper insights. A feasibility survey shows strong public interest, with 36 of 43 respondents willing to participate. Engaging the public could provide multi-faceted opportunities like educational hikes for scat and wildlife identification, teaching through scientific and indigenous Coyote storytelling perspectives, children’s engagement in learning about animal scat, presentations on coyote and human coexistence, predator tolerance education, sharing research results with interested community members, engaging visitors, and supporting researchers.

Abstract:

Coyotes (Canis latrans) have coexisted with humans in Colorado for millennia, demonstrating remarkable adaptability to anthropogenic changes. Their habitat range is diverse and expanding. They shape ecosystems by balancing populations of rodents, ungulates, and mesocarnivores, which enhances bird diversity, disease control, and plant diversity. Despite their elusive nature, coyotes often use human trails for travel and communication. A study led by CU PhD candidate Emily Golden Beam and ENVS professor Joanna Lambert investigates coyote behavior through scat analysis in Boulder County Open Space. Scat samples are collected to analyze gut microbiome, parasite load, hormone levels, and diet, providing insights into how human and environmental factors influence coyote behavior and improving human-coyote coexistence. However, collecting fresh scat samples is challenging due to their random occurrence on the 155 miles of trails. Boulder County Open Spaces, with nearly two million

annual visitors, presents an opportunity to involve trail users as citizen scientists to report viable scat samples. Public participation in open science can enhance scientific engagement and data collection through crowdsourcing. More eyes on the trails increase the chances of locating scat samples, leading to deeper insights. Partial scat collection is non-invasive and effective for studying animals. Coyotes communicate via scat, so only partial samples are collected to preserve communication. Fresh samples (1-4 days old) are necessary for viable DNA and microbiome analysis. Between May 21 and July 16, 2024, undergraduates Renae Hernandez and Michaela Perez collected scat samples from various trails. A feasibility survey showed strong public interest in a citizen science project, with 36 out of 43 respondents willing to participate. Engaging the public in this research offers educational opportunities, including hikes for scat and wildlife identification, storytelling, children's programs, presentations on coexistence, predator tolerance education, and sharing research results with the community. This involvement can significantly enhance data collection and support researchers.

Present tense:

Coyotes (Canis latrans) have coexisted with humans in Colorado for millennia, demonstrating remarkable adaptability to anthropogenic changes. Their habitat range is diverse and expanding. Coyotes shape ecosystems by balancing populations of rodents, ungulates, and mesocarnivores, which enhances bird diversity, disease control, and plant diversity. Despite their elusive nature, coyotes often use human trails for travel and olfactory communication. A study led by CU PhD candidate Emily Golden Beam and ENVS professor Joanna Lambert investigates coyote behavior through scat analysis in Boulder County Open Space. Scat samples are collected to analyze gut microbiome, parasite load, hormone levels, and diet, providing insights into how human and environmental factors influence coyote behavior and improve human-coyote coexistence. However, collecting fresh scat samples is challenging for field researchers due to the rare and random findings on the 155 miles of trails. Boulder County Open Spaces, with nearly two million annual visitors, presents an opportunity to involve trail users as citizen scientists to report viable scat samples. Public participation in open science enhances scientific engagement and data collection through crowdsourcing. More eyes on the trails increase the chances of locating scat samples, leading to deeper insights. Partial scat collection is non-invasive and effective for studying animals. Coyotes communicate via scat, so only partial samples are collected to preserve communication. Fresh samples (1-4 days old) are necessary for viable DNA and microbiome analysis. Between May 21 and July 16, 2024, undergraduates Renae Hernandez and Michaela Perez traveled 108 km and 57 hours and collected nine scat samples from various trails. A feasibility survey shows strong public interest in a citizen science project, with 36 out of 43 respondents willing to participate. Engaging the public could provide multi-faceted opportunities like educational hikes for scat and wildlife identification, teaching through scientific and indigenous Coyote storytelling perspectives, programs oriented towards children's engagement in learning about animal scat, presentations on coyote and human coexistence, teaching predator tolerance, sharing research results with interested community members, engaging visitors, and supporting researchers.

Condensed:

Coyotes (Canis latrans) have coexisted with humans in Colorado for millennia, demonstrating remarkable adaptability to anthropogenic changes. Coyotes shape ecosystems by balancing populations of rodents, ungulates, and mesocarnivores, enhancing bird diversity, disease control, and plant diversity. Despite their elusive nature, coyotes often use human trails for travel and olfactory communication. A study led by CU PhD candidate Emily Golden Beam and ENVS professor Joanna Lambert investigates coyote behavior through scat analysis in Boulder County Open Space. These scat samples are being collected to be analyzed in the lab so we can learn about coyote gut microbiome, parasite load, hormone levels, and diet. These data will tell us more about how people and the environment may be shaping coyote behavior, and how we can improve human coyote coexistence. Between May 21 and July 16, 2024, undergraduates Renae Hernandez and Michaela Perez collected nine scat samples from various trials.On average, it took about 6.33 hours and 12 kilometers to find one scat. Collecting fresh scat samples in 155 miles of trails is challenging for field researchers due to the rare and random findings. Boulder County Open Spaces, with nearly two million annual visitors, presents an opportunity to involve trail users as citizen scientists to report viable scat samples. Public participation in open science enhances scientific engagement and data collection through crowdsourcing. More eyes on the trails increase the chances of locating scat samples, leading to deeper insights. Coyotes communicate via scat, so only partial samples are collected to preserve communication. Fresh samples (1-4 days old) are necessary for viable DNA and microbiome analysis. A feasibility survey shows strong public interest, with 36 out of 43 respondents willing to participate. Engaging the public could provide multi-faceted opportunities like educational hikes for scat and wildlife identification, teaching through scientific and indigenous Coyote storytelling perspectives, programs oriented towards children's engagement in learning about animal scat, presentations on coyote and human coexistence, predator tolerance education, sharing research results with interested community members, engaging visitors, and supporting researchers.