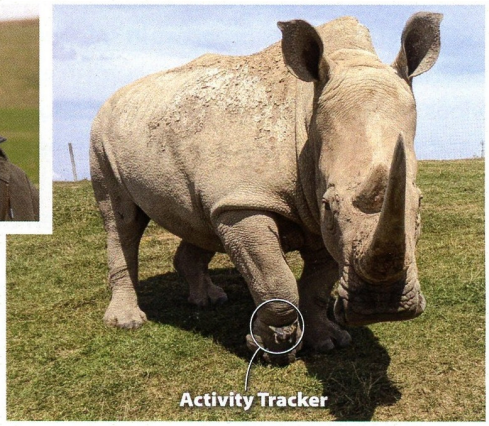
American Institute of Rhinoceros Science (AIRS): A Model for Saving Species With Science *Ex Situ*

CREW is WILD about The Wilds!

CREW rhino scientists have been collaborating with The Wilds for 25 years, but 2022 marked the evolution of an even closer working relationship between the two facilities with the implementation of AIRS. The Wilds offers a unique opportunity to study the most successful rhino breeding center in North America, boasting five generations of rhinos born at the facility. What sets The Wilds apart from most zoos is the management strategy, one that few other locations can replicate. During the winter, rhinos are housed in large, heated barns with access to adjacent paddocks, a system that mimics that used in many zoos. But during the summer months, the entire female crash (i.e., group) along with that year's breeding bull are moved to a 138-acre pasture, complete with hills, wallows, lakes, and trees, allowing up to 18 rhinos to live in a multigenerational, semi-free ranging setting. Studying the physiology, reproduction, and wellbeing of this rhino group under these two extremes in management will be invaluable in gaining insight into the environmental factors that are important for optimizing rhino care, health, and longevity in zoos. A new CREW staff member, Dr. Parker Pennington, oversees all AIRS activities at The Wilds including monthly and weekly blood sampling, behavior and temperament observations, activity levels, and body mass measurements. Parker received her B.S. and M.S. from Louisiana State University, her Ph.D. from George Mason University, and conducted her post-doctoral training at the San Diego Zoo Global's Institute for Conservation Research where she was integral in the successful production of white rhino calves by artificial insemination.



Dr. Parker Pennington



Do Rhino Horns Hold Secrets to Rhino Health?

We know that black and Sumatran rhinos store excess iron in their livers, a condition termed iron overload disorder (IOD), but we have no way to monitor just how much they are storing while alive because liver biopsies simply aren't feasible in rhinos. During AIRS brainstorming sessions two years ago, the idea of measuring iron in rhino horns emerged. We know from the scientific literature that human hair (keratin) accumulates different minerals, including iron, that can reflect body concentrations. Since rhino horn is also made of keratin, it may do the same. The first phase of our AIRS IOD study was to test samples taken from different areas along the horn to determine what minerals can be detected and their variation due to location and/or sample color. Results revealed there are many minerals in rhino horn (including iron!), but samples must be taken at least 1 cm deep to avoid environmental contamination. Apparently, all that mud wallowing gives dirt ample opportunity to permeate the horn's surface. With this critical information in hand, we have now initiated the second



phase of the study – determining if black rhino horns contain more iron than white rhino horns. Since white rhinos do not suffer from IOD, their horns should contain lower iron concentrations if rhino horn iron does indeed reflect body iron loads.