

Technology for Environmental Enrichment: Safe and Effective in Lowering Undesired Habits in Southern Sea Lions and Northern Elephant Seals during Rehabilitation

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Description

Environmental enrichment plays a crucial role in the rehabilitation process of marine mammals, such as Southern Sea Lions (*Otaria flavescens*) and Northern Elephant Seals (*Mirounga angustirostris*). With the advancement of technology, various innovative tools have been developed to enhance their captive environments, promoting physical and mental well-being. This article explores the application of technology for environmental enrichment in the rehabilitation of Southern Sea Lions and Northern Elephant Seals and examines its safety and effectiveness in reducing undesired habits during the rehabilitation process [1]. Marine mammals in rehabilitation centers often exhibit undesirable habits due to stress, confinement, and limited stimulation in captivity. The provision of an enriched environment can improve their well-being, aiding in their recovery and successful reintegration into the wild. Technological advancements offer promising opportunities for implementing innovative tools and strategies to provide effective environmental enrichment during the rehabilitation process.

Southern Sea Lions (*Otaria flavescens*) are a species of eared seals that inhabit the coastal regions of South America, particularly Argentina, Chile, Uruguay, and the Falkland Islands. They are the most abundant and well-known species of sea lions in the Southern Hemisphere. Southern Sea Lions exhibit a variety of interesting behaviors that are vital to their survival and social dynamics within their colonies. Southern Sea Lions are highly social animals and form large breeding colonies called rookeries. Within these rookeries, dominant males establish territories and harem groups, consisting of several females and their offspring. The males compete for dominance and defend their territories through vocal displays, aggressive posturing, and physical confrontations. Vocal communication plays a crucial role in Southern Sea Lions' social interactions. Males produce distinctive vocalizations, such as roars and barks, to establish dominance and attract females.

Northern Elephant Seals (*Mirounga angustirostris*) are large marine mammals known for their remarkable size and distinctive proboscis, which gives them their name. These seals are found along the Pacific coast of North America, ranging from Baja California, Mexico, to northern California, United States. Northern Elephant Seals exhibit unique behaviors that are essential for their survival and reproductive success. Breeding is a critical aspect of the Northern Elephant Seal's behavior. During the breeding season, which typically occurs between December and March, dominant males establish territories on beaches and form harems of females [2]. These males engage in fierce battles to defend their territories and have exclusive mating rights with the females. The fights involve aggressive vocalizations, physical clashes, and displays of strength. After the breeding season, Northern Elephant Seals undergo a molting period. They shed their old fur and grow new, thicker skin and fur.

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VR and AR technologies offer simulated natural environments, allowing marine mammals to experience sensory stimulation resembling their natural habitats. This immersive experience can reduce stress and potentially decrease undesired habits. Sophisticated underwater sound systems can mimic natural acoustic environments, providing marine mammals with auditory stimuli similar to those encountered in the wild. This approach can help decrease excessive vocalizations and promote effective communication skills [3]. Technological advancements have led to the development of interactive puzzle feeders and sensory toys that stimulate the cognitive abilities of rehabilitated marine mammals. These tools encourage problem-solving, reducing stereotypic behaviors and promoting mental engagement.

The safety and ethical considerations surrounding the use of technology for environmental enrichment are of paramount importance. These technologies must prioritize the welfare of marine mammals, ensuring that the benefits outweigh any potential risks. Regular monitoring and assessment of the rehabilitated individuals' response to technological enrichment are essential to identify any adverse effects. Behavioural observations, physiological measurements, and long-term monitoring post-release are vital to evaluate the success of these interventions.

The case study of Southern Sea Lion explores the implementation of technology-driven environmental enrichment strategies in a Southern Sea Lion rehabilitation center, focusing on reducing aggression and stereotypic behaviours [4]. This case study examines the application of technology for environmental enrichment in a Northern Elephant Seal rehabilitation program, emphasizing the development of foraging skills and the reduction of excessive vocalizations.

Technology-driven environmental enrichment methods have shown great promise in mitigating undesired habits observed in Southern Sea Lions and Northern Elephant Seals during the rehabilitation process. Virtual reality, acoustic enrichment, and interactive puzzle feeders provide stimulating experiences, reducing stress and promoting the development of crucial skills for survival in the wild. Nevertheless, the safety and ethical considerations surrounding the use of these technologies must remain a priority, ensuring the well-being of the rehabilitated individuals. Further research and ongoing monitoring are essential to optimize the implementation of technology for environmental enrichment in marine mammal rehabilitation programs and improve their success rate [5].

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Conflict of Interest

There are no conflicts of interest by author.

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