

# Swim pattern as an index of adjustment following a new animal introduction in the California Sea Lion (*Zalophus californianus*)

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## Introduction

When new animals are introduced in a captive environment, increased stress levels can be anticipated. During this time, caretaker concern for the health of the animals and for outbreaks of aggression should be heightened.

It is therefore highly beneficial for caretakers to have a sense of the time course over which new animals settle into their new surroundings.

When sea lions are held in captivity, it is common for individuals to establish habitual swim patterns within their enclosures. In this study, we used the time course over which a newly introduced sea lion developed a consistent swim pattern as an index of the time course over which it adjusted to its new environment.



Figure 1: Pool Layout



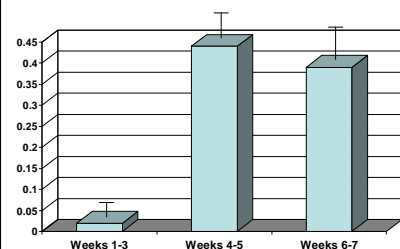
## Procedure

We tracked swimming patterns in a group of three male California Sea Lions for seven weeks following the introduction of a new individual in the Buffalo Zoo Sea Lion Cove exhibit. Figure 1 shows the overall layout of the enclosure.

Three days per week, one hour per day, we recorded the frequency with which each of the three individuals swam through the exhibit in any of four patterns:

- swimming back and forth in front of the feeding station
- circling within the "inner" zone
- circling throughout the "outer" zone
- "other"

Figure 2: Proportion Time in Outer Zone, by Time: Introduced Sea Lion



## Results

Our findings are presented in the following table:

Sea Lion	Sw Pattern	Wks 1-3	Wks 4-5	Wks 6-7	F (2,22)	p
DA (original)	Bk/Forth	.44	.53	.77	1.33	ns
	SW Inner	.01	.01	.00	0.79	ns
	SW Outer	.00	.01	.00	2.20	ns
	SW Else	.03	.03	.01	0.21	ns
PO (original)	Bk/Forth	.52	.57	.84	1.75	ns
	SW Inner	.05	.00	.01	0.49	ns
	SW Outer	.00	.01	.00	2.20	ns
	SW Else	.09	.10	.03	0.48	ns
SM (new)	Bk/Forth	.05	.00	.00	1.42	ns
	SW Inner	.30	.21	.44	0.97	ns
	SW Outer	.02	.44	.39	9.12	0.001
	SW Else	.19	.14	.06	0.56	ns

The two original sea lions showed no significant variations in their swim patterns in the aftermath of this introduction. By contrast, the new individual did show a significant change over time, specifically in the percent of time spent swimming in the "outer" zone.

For the new animal, the mean time spent in the outer zone was only 0.017 during weeks one through three. It then increased dramatically to an average of 0.424 during weeks four through seven. In other words, the new male utilized a much smaller portion of the pool during the first three weeks compared to the subsequent month (see Figure 2).

## Discussion

If the development of consistent swim patterns can be taken as an index of acclimation to a new sea lion's physical/social environment, our data indicate that it took the new animal a period of three weeks to settle in.

In future studies, it would be interesting to assess whether more traditional indices of stress levels (e.g., breath rates, cortisol levels) correlate with this behavioral index. In the meantime, we offer these findings as a model for assessing habituation following new animal introductions, and we recommend heightened awareness by keepers for at least three weeks following introductions of this type.