Canada Lynx Update:
Behavior project

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Overview…

Canada lynx (*Lynx canadensis*) are the most abundant felid species inhabiting North America's boreal forest. However, southern populations of lynx have declined dramatically in the last century, and in 2000, the US Fish and Wildlife Service listed them as a threatened species. In order to develop effective conservation strategies and management plans for Canada lynx, it is critical that we develop a stronger understanding of the physiology and behavioral ecology of this species. Knowledge of individual variation in behavior (behavioral types) and physiology (e.g., stress reactivity) has many applications in the field of conservation.

The goals of this project were 1) to examine individual variation in behavior among Canada lynx, and 2) to develop a better understanding of how hormone expression correlates with behavioral type. This project was conducted as Lauren's senior thesis, and was entitled "You are what you secrete: Examining the relationship between hormones and behavior in Canada lynx."

Photo courtesy of Cincinnati Zoo

What we did…

The project was broken up into three parts: (1) keeper surveys about the behavior and personality of individual lynx, (2) direct behavioral observations conducted by Kerry and Lauren of responses to stimuli (mirror, beaver castor scent, snowshoe hare distress cry), and (3) analysis of the "stress" hormone levels in fecal samples.

To accomplish our first goal, we took the survey and observation data and tried to identify broader categories of behavior based on variables that clustered together (data were analyzed using factor analysis). These broader groups provided terms that we used to describe a lynx' behavior or personality. For the second goal, we looked for correlations between the behavior categories and expression of "stress" hormones (glucocorticoids) for each individual lynx.

What we found…

From the surveys and behavioral observations, we identified 10 categories of Canada lynx behavior: *curious, active, *alert, *extroverted, communicative, proactive, sociable, bold, *nervous, and aggressive. When we examined the relationship between all of these categories we found that four of them (indicated by *) were statistically correlated, and together, they describe a dimension of lynx personality that we termed "curious/nervous." This dimension of personality is similar to ones that many other researchers have found in other species.

Finally, we found that from all the behavior categories, one was significantly correlated with "stress" hormone expression. Lynx that spend more time "alert" have higher peak values of stress hormones (i.e., they exhibit a more pronounced physiological response when stressed; Figure 1).

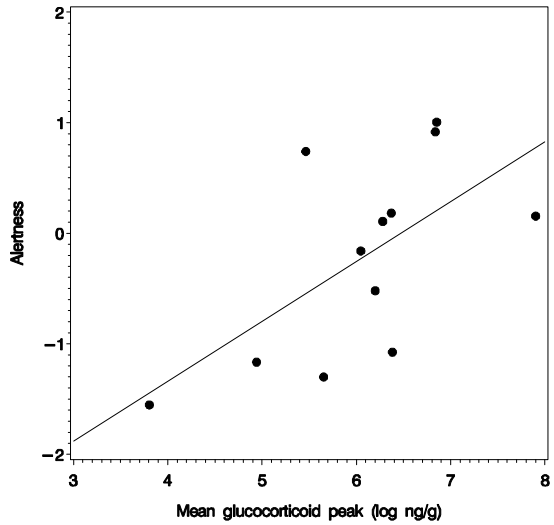

Figure 1. Correlation between "alertness and mean glucocorticoid peak.

Why it matters…

Potential applications of these results are very exciting. Conservation biologist can use information about behavioral types to target individuals that may respond better to stressful events (e.g., reintroductions, captive breeding programs, etc.). By choosing individuals that will respond better to stress we can hopefully increase the success of these events and further enhance the species populations!

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