R E P O R T

SOCIAL ORGANISATION OF MARINE COASTAL OTTERS: OVERVIEW OF A WORK IN PROGRESS

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INTRODUCTION

Since 1983, I have observed a marine coastal population of the North American otter, *Lontra canadensis*, at Trinidad Bay, California. My research has two primary purposes: to chronicle the lives of wild otters, and to understand the social organisation of this population. The following is a brief summary of my observations concerning the social behaviour of the otters of Trinidad Bay.

METHOD

Trinidad Bay is a shallow marine bight perimetered by densely vegetated shorecliffs, located on the far-northern seacoast of California (41°3´N, 124°8´W). The resident otters are totally marine in their habitat suits the otter well. From 6 to 18 individuals (4-11 adults) have occupied a 4km section of coastline during the period of my observations.

I study the otters naturalistically, observing them at very close distances (<100m). Because of this proximity, I do not require telemetry, nor do I use any instrumentation other than 10x28 binoculars, a tape recorder, a photographic camera, and a video camera. From May 1986, when my formal study began, to November, 1996, I conducted 2778 sessions, and saw otters at trinidad Bay 2411 times (86% success).

My field notes are entirely descriptive, and I use no numeration to analyse the otters´ behaviour. I simply observe the otters, describe their behaviours, and interpret what I see in the context of all I have observed previously. I am not testing any theories or models of science; there are no null hypotheses to disprove, and no levels of statistical significance to achieve. It is simply my goal to observe and understand the behaviour of the otters directly and completely as possible, and to do so wholly within the context of the otter´s immediate world.

Essential to any examination of social organisation is the ability to identify individuals reliably. Because I can observe these otters so closely ad so often, no artificial means of marking is required, as each otters has recognizable facial, physical, and behavioural charcateristics which mark them as individuals. Identification is also facilitated as the otters form social groups of stable membership. I´ve observed almost all of these otters virtually daily since they left their natal nest, and I know of their faces, features, and behavioural singularities ta a high levels of accuracy and reliability.

RESULTS

The otters at Trinidad Bay form two distinct, cohesive social groups: a maternal “Family”, and a male “Clan”. The Family comprises the mothers(s), pup(s), and usually, at least 1 elder daughter as a full time cohabitant (who may have pups of her own). The Clan comprises the population father´s, sons, matrilineal brothers and immigrant males. From 1986-1996, the sex ratio of adults ranged from a high of 7m:1f (1986, 1987), to no lower than 5m:3f (1991). In

1997, however, for the first time during my study, adult females outnumbered adult males (2m:3f).

The most consistent pattern in the social organisation of these otters is that adults of the opposite sex lead largely separate lives. Adult otters at Trinidad Bay typically practise a behavioural segregation of the sexes. The adult males are the primary determiners of sexual segregation, except during the females´ period of natality, when adult females actively repelled adult males.

From 1988-1992, this sexual segregation was remarkably rigid. For example, a period of 70 months (1481 sessions) elapsed between instances when I saw an adult male and an adult female forage together, and 58 months (1282 sessions) elapsed between observed episodes of reciprocal play between opposite-sex adults.

Yearlings may interact freely with adults of both sexes, but after a female has her first oestrus, she is thereafter shunned, and may be attacked, if she attempts to interact with the adult males. Most males stop aggressing against an adult female after she bears her first litter, however, as maternity confers an elevated social status upon a female.

The closer the maternal relationship between a male and a female, the freer they interact socially. The closer the maternal relationship between a male and another male, the closer they are bonded socially.

In July 1992, within a period of 3 weeks, all three mothers in the population died. Only one female remained - a yearling - who subsequently spent the second year of her life as a fully co-equalmember of the male Clan. After her first mating season, however her fellow Clan-mates became highly intolerant of her mere presence, and she was expelled aggressively from the Clan. Following her social ostracism, the young ault female spent the third year of her life sharing the same home range as her former Clan-mates, but living a completely involuntary solitary existence. The Clan did not stop avoiding her untill well after she bore her first litter. In her second year as a mother, however, the frequency of amicable interactions between the males and the new matriarch increased gradually, to the extent that, by mid 1995, I was forced to conclude that the rigid regime of sexual segregation I witnessed from 1988-1992 was no longer in effect. The Familiy and Clan still lead separate and independent lives, but today, when the adult members of the Familiy and Clan encounter each other, they interact freely (with some individual exceptions on the part of some adult males).

The gregarious males display no intrasexual territoriality whatsoever, except for transitory episodes during the females´oestrus. Adult females, however, are aggressively territorial against any other female over a year old who is not their daughter, mother or littermate sister. An adult female never forces her own yearling daughters to disperse, but she will almost always attempt to expel a yearling female relative who is not her daughter. When a juvenile female reaches 14 months of age, she may thenceforth be preceived as an interloper - and be attacked on sight - by any adult female who is not her mother. An elder sister may thereby force her younger sister to disperse from her home territory. Similarly, a grandmother may also attack and expel a granddaughter. territorial expulsion attacks by resident females against interloping females are astonishing fierce. In the severest territorial attack, the eldest daughter of the matriarch killed the yearling daughter of the matriarch, in the matriarch´s presence. The matriarch subsequently killed her eldest daughter, and thereafter starved herself to death.

DISCUSSION

Stable social groups of adult male *Lutra canadensis* were first described by SOLF (1972). The male Clan at Trinidad Bay has essentially the same characteristics as SOLF´s "group of bachelor males", which he observed in marine coastal habitats in Alaska. The tendency for adult males of this species to form communal social assemblages is apparently not a local phenomenon.

Although elder cohabitating daughters are companions to their mother´s dependent pups, the elder daughters are not alloparents, because they do not provision their mothers´s pup with food, nor will they assume parental care in the mother´s absence.

The consistently male-biased sex ratio among adults is the result of, and a reflection of the differing forms of sociality and territoriality expressed by males and females in this population. Males are non-territorial, gregarious with other males regardless of family relatedness, and didn´t voluntarily disperse as adults, whereas females are highly territorial, did not bond with any other females except thier own immediate matrilineal relatives, and actively forced their younger female kin to disperse. Under such a social regime, assuming equal birth and mortality rates between males and females, adult males should always outnumber adult females in this population. The female-biased sex ratio observed in 1997 resulted from an absence of male births from 1992-1995.

I currently speculate that the rigid sexual segregation I witnessed at Trinidad Bay from 1988-1992 may have been due principally to the presence of one particular female - the favoured eldest daughter of the old matriarch - for whom some males possessed an observable enmity. The relaxation in sexual segregation and the corresponding increase in free interaction between the sexes took place when a female who had grown to adulthood as a social co-equal with the males assumed the status of matriarch. This spring however, the two females born in 1995 had their first oestrus, and preliminary observations indicate that the social order of this dynamic population is changed yet again. Thus far, the adult males are not shunning or behaving aggressively toward their neo-adult nieces.

Although, after over a decade of study, I have achieved my goal of understanding the social behaviour of these otters, I cannot yet explain many aspects of it in terms which are consistent with the principles of selectionsism and behavioural ecology. Several observed phenomena are particularly difficult to explain in terms of current biological theory.

1) Males bonding socially with other males to the exclusion of adult females, and actively avoiding and sometimes attacking the only breeding female(s) in their population.
2) The closer a male and a female are related, the more likely they are to consort with one another.
3) Males and females occupy the same habitat concurrently, and share the same life requirements, yet their expressions of sociality and territoriality differ from the other´s as completely as night and day.
4) An adult female may mortally attack her own younger female kin.
5) A mother otter terminating her own life following the death of her companion daughters.

REFERENCES

SOLF, J.D. (1972). The land otter in Alaska. Alaska Department of Fish and Game, Wildlife Notebook Series. 2pp.

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