

INTRAFAMILIAL KILLINGS IN A MARINE COASTAL POPULATION OF OTTERS (*Lutra canadensis*)

J. Scott SHANNON¹, Sara L. MOORE²

¹ Post Office Box 24, Arcata, California 95518, USA.

² Post Office Box 875, Trinidad, California 95570, USA.

Abstract: Two killings within a family of otters are described. In one event, an elder sister killed her yearling sister; in the second, a mother killed her eldest daughter. The first killing is explained as an extreme act of territorial defense. The second killing is explained as an act of retaliation against the female that committed the first killing.

INTRODUCTION

Animals of many species have been known to occasionally kill conspecifics. Among Lutrines, for example, male sea otters (*Enhydra lutris*) have inflicted mortal wounds on females during copulation (STAEDLER and RIEDMAN, 1993). Sometimes, conspecifics may kill one another in fights over territory, access to mates, or food, but among mammals, it is extremely rare for a female to kill another matrilineal-related female (e.g., mother/daughter, grandmother/granddaughter, sister/sister) for any reason. No such event has thus far been documented among Lutrines. This paper describes and attempts to explain two female/female intra-familial killings in a marine coastal population of *L. canadensis*, and elaborates upon findings reported previously by SHANNON (1991, 1992, 1993).

STUDY AREA

The study area is Trinidad Bay (41°3'N, 124°8'W); a small, shallow marine bight on the far-northern Pacific seacoast of California. The otters' home range comprises approx. four linear km. of marine coastline that is predominated by thickly vegetated rocky shore cliffs. The otters at Trinidad Bay are exclusively marine in their habits. There are no streams or known bodies of standing fresh water within the otters' home range. The otters obtain their water by drinking from numerous springs and seeps, which flow year-round down the faces and crags of the shore cliffs.

MATERIALS AND METHODS

The otters are studied by direct observation. The principal investigator began his study informally in June 1983, formalized it in May 1986, and continues to study the otters at Trinidad Bay to the present day. Observations take place during the two hours preceding sunset; daily whenever possible. Since 1983, 63 otters of known identity or birth have been studied whose lives span five otter generations. During this period, the population has comprised of 4-11 adults. Because the otters are observable at close quarters (5-100 m.), they can be identified reliably by direct visual recognition. The otters are identified primarily by facial markings and other physical characteristics, but

idiosyncrasies of behavior are also reliable marks of individual identity. Equipments used are 10x28 binoculars, a tape recorder for dictating field notes, and a 35 mm camera and video camera for visual documentation. The otters have never been trapped, handled, monitored, or been subjected to any other invasive technique.

RESULTS

In 1986, a new mother established her territory at Trinidad Bay: F'2 ("Old Mama" = OM). That spring, OM bore two daughters, F86A ("Mama Junior"=MJ), and F86B ("Scarnose" = SN). After attaining independence, yearling MJ and SN returned to live as full-time cohabitants with OM and her litter of 1987. MJ and SN became adults in 1988, yet the two sisters returned again to live with their mother and her new pups. In 1989, MJ and SN could have had pups of their own, but they did not, and that spring, they returned for the third time to their mother's family. Over these years, it became obvious that MJ was the more "faithful" of OM's elder daughters, and further, that MJ was OM's "favored" daughter - and her "heiress apparent". In 1990, MJ finally bore her first litter (SN still remained nulliparous). Despite now being a mother herself, MJ did not disperse, and she (and SN) returned yet again to live with OM after both MJ and OM weaned their respective pups. Thus was a stable three-generation "Super-family" formed. The two mothers and their pups lived together and foraged together, but each mother provided only for her own offspring. If a pup solicited or took food from the wrong mother, the pup was likely to be vocally warned or physically punished. Despite the pups' occasional transgressions, though, OM and MJ rarely aggressed against each other's young, and if punishment did occur, the bites inflicted were not severe.

In the spring of 1991, however, two portentous events took place. The first was that, for the first time since 1987, a female pup of OM survived to independence: F90C ("One Eye"=OE). As stated previously, a mother was rarely aggressive towards a related mother's dependent young, but now that OE was an independent yearling, MJ began to attack her younger sister with extreme uninhibited aggression. As a result of MJ's attacks, OE was forced to disperse from Trinidad Bay. The second event of portent was that, in 1991, at the age of 60 months, SN bore her first litter. OM had tolerated her favored elder daughter MJ to remain with her at Trinidad Bay, but now that her lower-ranking daughter SN had become a mother, OM turned against her. Like MJ attacked OE, OM now began to attack SN. At the same time, MJ began to be aggressive towards her sister's newborn. The observer had never seen a mother gratuitously attack a related mother's pup before, but on 26 July 1991, in SN's presence, MJ attacked one of SN's pups, apparently with the intent to kill it. SN tried to defend her pup by biting at MJ, but this only increased MJ's ferocity. MJ stopped her attack only after SN mounted MJ (among females, mounting is a sign of appeasement and submission by the mounter). Mere minutes later, OM encountered SN and attacked her. At five years of age, with her mother aggressively intolerant of her presence and her sister now a mortal danger to her pups, SN was finally forced to disperse from her birthplace.

After OE and SN were expelled in 1991, OM and MJ again formed a Super-family. Initially, both mothers had three pups, but an accident killed two of

OM's soon after the Super-family was formed. OM's sole surviving pup was a female, F91B[F'2] ("Little Porpoiser"=LP). During 1991-1992, OM was unusually attentive to LP, while concurrently, OM seemed much less attentive to her old favorite daughter, MJ. In June 1992, when both mothers were due to bring new litters to the bay, OM returned pupless, and she was already cohabitating with LP. MJ, however, did not return to the bay when she should have. During this period, OM attacked one of her yearling granddaughters (F91B[F'3]) with the same ferocity as was observed during MJ attack OM's yearling daughter. Thus did OM expel this granddaughter from her home area. When MJ finally returned, she, too, was pupless, and equally notably, MJ did not behave like she was a resident anymore. Despite attempts to win back her mother's favor, OM shunned MJ. OM had broken any bond she had with her elder daughter in favour of her yearling daughter. MJ's status as her mother's favorite had been "usurped" by LP. Recalling what MJ had done to OE the previous year, and having seen OM attack her own granddaughter savagely, it appeared that a confrontation might soon occur between MJ and LP.

On 4 July 1992, MJ revisited Trinidad Bay, and in her mother's presence, MJ attacked LP, and killed her. OM defended her yearling daughter by biting a large section of flesh off of the left side of MJ's face, but was too late to save LP from being slain. MJ was gravely wounded by OM. The observer has never seen an otter's face so swollen and distorted by an injury. OM was not wounded physically in the fight, but as it turned out, OM's behaviour could be described as being mortally wounded emotionally. For three days after LP's death, OM did not leave her dead daughter. Most astonishing were OM's cries of mourning. Her loud, sonorous, descending-pitched, loon-like wailing ("Uuurrr-r-r-r! Uuurrr-r-r-r!") was audible 100 m. away. Five days after the killing, it became clear that OM had lost her will to live. Still crying intermittently, OM was seriously emaciated from not eating for days, and she was visibly languishing. OM was seen alive for the last time on 9 July. MJ was last seen alive on 10 July. On 11 July, MJ was found dead on the northern beach of Trinidad Bay. MJ had died from wounds received prior to her actual time of death, as the position of her body indicated that she had simply lain down and died peacefully. On 18 July, the wasted body of OM was discovered farther east along the same beach. The old matriarch had died from intentionally failing to maintain her life requirements. In effect, Old Mama had committed suicide.

CONCLUSIONS

Adult females at Trinidad Bay will attack and even kill their younger female kin to retain exclusive possession of their territory. MJ's attack on her yearling sister was an unambiguous attempt at territorial expulsion that was carried to its fatal extreme. OM's mortal wounding of MJ was in obvious retaliation for MJ's lethal attack on OM's yearling daughter. These killings were remarkable, not only because they are behaviours that, according to biological theory, are not supposed to happen, but also because it illustrates graphically how a single episode with a relative frequency of near zero set in motion a series of events that overthrew and utterly destroyed a matriarchy that had been cohesive, stable, and ultimately adaptive across two generations.

Otters may grieve their dead. Otter mourning behavior was described previously by MOORE-WILLSON (1898) (quoted in SETON, 1929), and by KULISH (1969). Their observations were fully affirmed and substantiated in the present study.

Acknowledgements - Grateful thanks to Daniel Lorey for his help in preparing this manuscript for publication.

REFERENCES

- KULISH, J.W. 1969. Bobcats before Breakfast. Stackpole Books, Harrisburg, Pennsylvania, 189 pp.
- SETON, E.T. 1929. Lives of Game Animals. Doubleday, Doran and Company, Garden City, New York.
- SHANNON, J.S. 1991. Progress on Californian otter research. IUCN OSG Bull. 6, 24-31.
- SHANNON, J.S. 1992. Progress on Californian otter research: 1991. IUCN OSG Bull. 7, 29-32.
- SHANNON, J.S. 1993. Report from Trinidad Bay: 1992 IUCN OSG Bull. 8, 24-27.
- STAEDLER, M., RIEDMAN, M. 1993. Fatal mating injuries in female sea otters (*Enhydra lutris nereis*). Mamm. 57, 135-139.