INVENTING A BEAST WITH NO BODY:
RADIO-TELEMETRY, THE MARGINALIZATION
OF ANIMALS, AND THE SIMULATION OF ECOLOGY

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Abstract
Radio-telemetry is a relatively new technology that is having powerful impacts on
the way wildlife is studied. With tens of thousands of new radio-telemetry units pro-
duced each year, to be placed on animals in the wild, it is a technology that is
becoming increasingly pervasive. This paper begins by examining the way radio-
telemetry has been adapted for the study of macaws in Latin America. The paper
argues that as a form of surveillance and monitoring, radio-telemetry illustrates some
ways in which Michel Foucault’s concepts of “biopower” and surveillance can be
applied to the management of wildlife. Additionally, as the new technology creates
a greater sense of distance between the “sign” of a creature and its actual reality,
wild animals seem to become what Jean Baudrillard terms “simulations”, in which they
are increasingly signs of their own disappearance—both as creatures and as species.

Keywords: Biopower, endangered species, radio-telemetry, wildlife surveillance, Foucault

Introduction

For about a week we had been hiding inside a blind of palm leaves
at the base of a huge almendro tree. We were near the confluence
of Río Carlos and Río San Juan, in the Caribbean lowlands at the
rainy border between Nicaragua and Costa Rica. In the cavity of
the tree, about 100 feet up, was the nest of a great green macaw.
Called lapa verde in the local Spanish, and also called Buffon’s macaw
(Forshaw 1977: 360), the great green macaw is the second largest
psittacine, or member of the parrot family, in the New World. It is
two and a half feet long, from beak to tip of its long, iridescent tail.
Its beak—massive even for a macaw—makes it the only bird able
to crack open the very tough casing on the fruit of the almendro.
Magnificent by any standards and listed as endangered by the
Convention on International Trade in Endangered Species (CITES),
the bird nevertheless had not been studied in the wild until 1993.
As banana plantations, heart-of-palm plantations, and cattle fields
replace the great lowland forests of Central America, the great green
macaw’s habitat in Costa Rica has been reduced to about ten per cent of its former range.

The goal on this occasion was to capture one of the parent macaws as it returned to the nest to feed the young inside. Once the macaw is captured, biologists will take careful measurements of its body and its brood. The main purpose of the capture, however, is to fit the parent with a small brass radio-transmitter. This is the first successful study of macaws using radio-telemetry. To fit on a bird, the transmitter needs to be very small and, more importantly, tough enough to withstand the bird’s great beak as it inevitably tries to peck the collar off.

As I helped the team of biologists prepare to try to capture this nesting family of great green macaws, I found myself interested in a central paradox in our efforts to save endangered and threatened wildlife. Even the technologies we increasingly deploy in studying creatures—in knowing them and in managing for their preservation—are implicated in and may contribute to the marginalizing and disappearance of the very animals we want to save. It is this paradox that I will be exploring in this paper.

Radio-telemetry has made a new kind study of wild animals possible, one that transcends the limits of an older model of natural history with its emphasis on visual contact and careful observation. Radio-telemetry certainly constitutes an advance in our ability to gather information and knowledge about wild animals, helping to manage populations of many species from macaws to jaguars, from condors to black-footed ferrets. Nevertheless, using an analysis based on the concepts of surveillance and control in the work of Michel Foucault, I will argue in this essay that it is naïve to view this as an innocent advance in knowledge gathering. I will also maintain that as increasing numbers of species fall into the category of “endangered”, wild animals are reduced to living in marginal spaces, such as the virtual confinement of wilderness preserves. The task of the surveillance and information gathering, on the one hand, certainly provides a basis for setting aside land and habitat to manage wild creatures. But, I will argue, it is also a way in which broad cultural forces can be deployed against animals in new strategies of control, so that even with endangered animals such as the great green macaw, techniques of protection are simultaneously techniques of marginalization. Paradoxically, in most cases the result is not a species restored
to former levels of abundance, but the maintenance of the species at diminished and sequestered levels.

Finally, I will suggest that radio-telemetry is implicated in the disappearance of species in another way. The animal with the radio-transmitter disappears as a visible, embodied creature. It emerges from its life into ours as a particular frequency on a receiver. While the radio-transmitter allows the animal to be followed and known in new ways and in new detail, the coded patterns of the beeps on the transmitter constitute signs of the creature’s disappearance. Under surveillance, the endangered animal is disembodied as a creature and signals its own loss. It becomes something like what Jean Baudrillard calls a “simulacrum” of itself.

**Stake-out and Capture at a Macaw Nest**

Watching the great green macaws from a blind, the feeling of being on a stake-out in a covert operation is inescapable. Late on this particular morning, both parents returned, calling to their young. The parents perched atop of their nest tree. From inside the nest hole, the two babies answered in hoarse “coos”, begging for food. One of the parents flew to the cavity and landed. The leader of the biological team, Pam Wright, reached for the rope at her side, holding it in readiness. After a couple of feints toward the nest, the macaw finally slipped stealthily into the nest hole. Wright hauled hard on the rope, which was attached to a nearly-invisible fishing line. Threaded through the eyes of screws attached to the tree, the line connected to a home-made trap that looked roughly like the netting on a lacrosse stick. When the trap flipped over the hole, the macaws inside began to wail fiercely. Its mate lifted off the tree and circled above us, answering its family with loud screams.

The research team jumped into action. A Nicaraguan, Ulisis Alemán, climbed into a harness and ascended the tree, scrambling over epiphytes and bromeliads. Suspended a hundred feet in the air, he reached carefully into the cavity and scooped the parent out. One by one, he lowered the adult, then each of the two babies. On the ground we weighed and measured each of the birds. The final task was to fit the parent with a brass collar containing a small radio-transmitter. The collar was small enough to fit around the macaw’s
neck, and weighed only a few ounces. To prevent the macaw from removing it, the antenna for the transmitter was located inside a strong brass casing. (Until this project, radio-collars or transmitters had not been invented that could withstand the power of a macaw’s beaks. Since being developed for the great green macaw, collars are now also being used on the Spix’s macaw in Bolivia and the scarlet macaw of Central and South America.)

As she fitted the great green macaw with its collar, Wright also set the frequency of the transmitter. For the purposes of this study, this macaw now became known as “7.6”, its frequency on the radio. Each collared bird is given its own frequency, and thus is instantly identifiable by its signal. Using the signals from the transmitters, the biologists can follow or “track” these highly mobile birds through their dense forest habitats. Without radio-collars and transmitters, macaws and other parrot species have been very difficult, in some cases nearly impossible, to follow. The biologists take great care in handling the obviously terrified birds, which clearly suffer stress in the handling. And even as they handled the birds, the biologists would often stop to admire the birds’ exquisite beauty.

When the team finished with its “processing” of the macaws, the babies were returned to the nest and the parent released to fly to its mate. The babies called from inside the cavity, and the two parents sat for a few minutes in a distant tree. We tested the receiver and picked up the signal of the adult that had just been fitted with a collar. The two adults moved into the canopy of the nearby trees, their green plumage disappearing in the cover of the green forest. The beep on the radio receiver told us the macaw was still present, though now invisible.

Only thirty-five pairs of great green macaws remain in the wild in the lowlands of Costa Rica, and twenty of those pairs can be followed because at least one of the pair wears a radio collar. Biologists use this technology with the best of intentions, studying and protecting such deeply endangered creatures. But even as the birds disappeared from our view, I found myself thinking about the ways in which, increasingly, we are learning about animals even as they are disappearing. And I wondered what role the technology itself might play in the disappearance of species.
Increasingly, radio-telemetry is transforming the study of wildlife. The amount of information or data it enables biologists to collect is particularly useful in the conservation of animals whose populations are declining or threatened, as well as animals that must be managed for human activities like hunting. Through the use of radio-telemetry, wildlife biologists obtain data on a species' habitat preferences, food preferences, range sizes, as well as movement patterns throughout the range, population size, and social structure of the population. All of this information is basic to the management of wild animals.

Telonics, headquartered in Arizona, is one of the largest companies in the world to produce radio-telemetry products. According to the Telonics website (www.telonics.com), radio-telemetry is the “adaptation of aerospace technologies and reliability to the field of wildlife research.” Telonics was incorporated in 1978 and now has “tens of thousands” of radio-telemetry products currently in use in wildlife studies. Likewise, Neil Bower, Director of Marketing at Lotek, a Canadian radio-telemetry company, claims that Lotek produces “tens of thousands of radio devices annually for the study of wildlife” (Bower 2001). In fact, dozens of companies have moved into the industry.

Telemetry studies are now used to track endangered and hard-to-follow creatures such as California condors, released both along the coast of California and over the Grand Canyon. Radio-collars are used to keep track of the extremely rare and declining Iberian lynx in and around Doñana National Park in southwestern Spain. Wolves and polar bears wear radio-collars, their movements tracked by satellite transmissions. Elusive creatures such as boreal owls in remote northern forests and the tiny flammulated owl in the Colorado Rockies are studied with radio-telemetry, each wearing tiny backpacks. Endangered monk seals in the remote waters of Hawai‘i’s Northwestern Islands, and manatees in the heavily trafficked waters of Florida wear radio devices. Transmitters have been tried on the flamingos of the Yucatan Peninsula in Mexico (but are being redesigned). The first long-term study using radio-telemetry on jaguars in Calakmul Biosphere Reserve in southern Mexico is currently under way, making it possible to maintain surveillance on this virtually unstudied New World cat. Even tiny flat-tailed horned lizards in the American southwest deserts have had radio-transmitters designed for them. The small
backpacks are glued onto this lizard, which is disappearing as the
desert is transformed into large sun-worshipping cities.\textsuperscript{1}

While radio technologies are used on a wide range of animals,
they have proved particularly useful in gathering data on the large
and growing number of rare and endangered species. They make it
possible to learn about these hard-to-find and hard-to-follow crea-
tures. A good example of the ways in which radio-telemetry has
transformed what it is possible to know about animals under pres-
sure can be found in the award-winning book by ecologist Carl
Safina, Eye of the Albatross. The book traces the distant wanderings
of a single Laysan albatross through the expanses of the Pacific
Ocean. In a study of the albatrosses nesting on the remote North-
western Islands of Hawaii, researchers fitted several birds with radio-
transmitters. The transmitters emit signals that bounce off satellites,
so that researchers can track their movements from university or
research offices throughout the year. Using this information, Safina
writes a biography of a bird, in his case a female he names “Amelia.”
His book shows how much can be learned about a single animal,
and illustrates the usefulness of this information in conserving the
species (Safina 2002).

Radio-telemetry operates by gathering information about individ-
ual animals, such as Amelia or the great green macaw in Costa
Rica, “7.6.” Identifying individual animals is critical in assembling
useful information about a population of animals. The great green
macaw provides a good example of the ways in which elusive species
have become more accessible to knowledge through telemetry. These
birds nest high in trees. They can fly a hundred miles in a day or
two, cruising above the canopy. At rest in trees, they are nearly
impossible to see. Even when they are calling, their cryptic coloration
makes them blend invisibly into the forest. Up close, these birds can
be distinguished as individuals. Each bird has what is a unique mark-
ing of small feather lines across the bare white skin of its face. But
macaws are rarely seen up close in the wild, and never for long
enough to develop a catalog of their facial patterns. By capturing
them and equipping them with radio-collars, each individual can be
followed. Biologists can patrol the dirt roads of the agricultural low-
lands of the Caribbean slope of Costa Rica. At various places, they
can stop their vehicles, climb on roof or hood, and lift an antenna
into the air. With the receiver tuned to the particular frequency of
individual birds, the biologist scans with an antenna to try to pick
up the signals of the birds. By locating the signals of these birds, they know who is traveling, when they travel, how far they travel, and into what areas and habitats they travel. Such information has been essential in developing a biological profile of the species: its declining population and its basic, baseline requirements. This information has in turn been used to develop a conservation strategy of the species, which includes listing, preservation of habitat and nest trees, and environmental education with local people. The great green macaw has been turned into a symbol of pride among the local people.

**Surveillance, Wildlife Monitoring, and Biopower**

Radio-telemetry is, then, a technology used to generate knowledge of animals. It does so by gathering data at the individual level, and converting that to composite profiles, as it were, of species. The information garnered about species is then put into the service of managing that species. Science-based conservation is typically championed as the hope for wildlife, yet what may appear as an improvement in the condition of wildlife—designation as endangered—may in fact be a new form of control. It may be part of what Clare O’Farrell, in a study of the work of Michel Foucault, describes as the subjection of wildlife to a new regimen of boundaries and limits (O’Farrell 1989: 31). This new regimen, she argues, is not only about protecting wildlife; it is also about recreating wildlife as an Other that needs to be controlled in a new way: wildlife is not so much subjected to domination and repression, but it is managed, watched, and carefully controlled in its populations and habitats. This is true not only for threatened species, such as great green macaws and killer whales, but also for abundant species like deer.

In his essay “Policing Nature: Ecology, Natural Science, and Biopolitics,” Paul Rutherford emphasizes Michel Foucault’s “relentless unmasking of the naïve emancipatory claims of the human sciences.” He states that “its is (sic) perhaps timely that we subject the scientific understanding of environmental problems to the same critical attention Foucault directed at the ‘dubious’ human sciences” (Rutherford 1997: 546). Foucault’s work, both O’Farrell and Rutherford suggest, offers a framework for analyzing the role of the natural sciences in the production and reproduction of knowledge, particularly
in relation to the exercise of power over the objects of study. According to Foucault, power is not separate from knowledge, but enmeshed in it: it produces knowledge. Power is not simply negative and repressive, but creative and productive. Such knowledge in the service of power over bodies and populations Foucault calls “biopower.”

According to Rutherford, “biopower” is roughly equivalent to the notions of disciplinary control described in *Discipline and Punish* (Rutherford 1999: 39). Here, Foucault traces a transformation in the exercise of power from the spectacular imposition of government authority through public executions, to a form of control in which power is subtly enmeshed in daily life and internalized by the objects on which power operates. Central to this disciplinary regime is “an infinitely scrupulous concern with surveillance” (Foucault 1979: 173). The gaze and the various technologies associated with looking—the “the great science of optics”—established the epistemological foundation of the new forms of knowledge and control.

The exercise of discipline presupposes a mechanism that coerces by means of observation; an apparatus in which the techniques that make it possible to see induce the effects of power, and in which, conversely, the means of coercion make those on whom they are applied clearly visible. Side by side with the major technology of the telescope, the lens and the light beam, which were an integral part of the new physics and cosmology, there were the minor techniques of multiple and intersecting observations, of eyes that must see without being seen; using techniques of subjection and methods of exploitation, an obscure art of light and the visible was secretly preparing a new knowledge of man. (Foucault 1979: 170-71)

Surveillance, Foucault argues, had a normalizing effect on human behavior. The models of this form of seeing—which is at once knowing and coercing—were military camps, schools, hospitals, and prisons. Humans became bodies and populations, and in the process were policed by a “machinery of control that functioned like a microscope of conduct” (Foucault 1979: 173). The disciplinary gaze functioned as a form of regulation.

Foucault applies this form of knowing to human sciences because the objects of the gaze—the human subject—could be integrated into a regulatory system. The “supervised” becomes part of the whole with the “supervisor.” The world of nature is not, however, so responsive and cooperative.²

Rutherford extends Foucault’s analysis of science and power to
ecological problems. He argues that the ecological sciences have developed as a regulatory enterprise, a kind of “big science”:

Indeed, a notable feature of regulatory science is the role of the state and industrial interests (especially transnational corporations) in the manufacture, negotiation and certification of knowledge: that is, the central role these institutions play in the normative constitution of ecological knowledge. Regulatory ecological science does not so much describe the environment as both actively constitute it as an object of knowledge and, though various modes of positive intervention, manage and police it. (Rutherford 1999: 56)

According to Rutherford, both the natural and human sciences have developed “new practices of surveillance” which serve to “describe, partition, measure, classify, and refine” the objects they study (Rutherford 1997: 553).

Rutherford focuses his analysis on “biopower” and the operations of “policing nature” on matters such as pollution and global warming, which have a direct relationship to human health and hygiene. He does not examine the role of surveillance and “biopower” in relation to the study of wild animals, which provide their own epistemological and regulatory challenges to both surveillance and power. Radio-telemetry has clearly become a historically new practice of knowledge in the natural sciences, constituting its objects of study in new ways for monitoring and manipulating. The companies that produce radio-telemetry technologies, and the users of those products, describe telemetry variously as “wildlife surveillance,” “wildlife monitoring,” and “bio-monitoring.”

Radio-telemetry in wildlife study is closely associated with human surveillance and its military metaphors. The website of Telonics declares that their transmitters include “long-term deployment models, medium-sized tactical units, and miniature short-term units...adapted to meet diverse deployment scenarios.” The transmitters are used, for example, in “Border surveillance and protection,” “Timber and mineral theft protection,” “Marijuana field monitoring,” “Intelligence gathering,” and various “Covert operations.” The line between human surveillance in military operations, patrolling the frontiers and boundaries, and police work are blurred. In addition to wildlife surveillance, the website describes “intrusion detection” devices. As a cultural practice, radio-telemetry includes wildlife in a whole set of categories of “others”—from illegal aliens to criminals to military enemies—that must be watched and controlled.
Telemetry in the context of wild animals involves a new specialization of knowledge, in understanding the technical dimensions of managing the radio transmitters, receivers, antennae. Animals become known as frequencies. Their individual lives can be studied in startling detail, sometimes minute by minute, even as they pursue their lives out of sight of the researcher. Though the information is based on individuals, and can be used to control particular “problem” animals, more typically, as noted above, the data on individuals is compiled into composite profiles of populations and species. The data becomes formulae, graphs, and maps. It is knowledge particularly useful for management and conservation, much of it required by government agencies to determine status of a species, and conservation efforts necessary on its behalf. With this sort of knowledge, scientists working with government agencies can determine how much land, and what kind of land, needs to be protected for the preservation of the species. It can also contribute to determining the size of groups—herds of deer for instance—and setting hunting limits.

This knowledge is instrumental in the exercise of social, regulatory power over animals. Wild animals have long been constructed as problematic for human beings. Once abundant, powerful, and threatening, now they are increasingly threatened themselves. Endangered species on the one hand pose new problems of absence; while abundant species pose another problem; that of maintenance at very particular levels. This new regulatory order, made increasingly possible with radio-telemetry, does not seek the overt domination and defeat of animals. Rather, even in the name of protecting and preserving animals, it relegates them to an increasingly diminished place along the margins of civilization. It becomes the means by which we can define and describe their confinement. The language of our concern is at the same time the language of our dismissal of the animals, pushing them into the same category as the illegal aliens, enemies of the state, and outlaws.

Even the startling success stories of wildlife recovery almost paradoxically confirm the large social forces at work in monitoring and policing wildlife, on the one hand preventing them from going extinct, on the other keeping them from becoming too abundant. Mountain lions have responded well to protection throughout the western United States, and they have been subjected to a new round of hunting that has killed larger numbers than during the bounty hunting period of the early twentieth century. Wolves have been reintroduced into Montana, Wyoming, Idaho, and New Mexico. They are monitored
and carefully controlled in these recovery efforts. “Rogue” creatures are disciplined. Any wolf that kills a ranger’s stock will, for example, be removed. If it proves incorrigible, it can be shot. And radio-telemetry is one of the primary instruments of knowledge through which animals are being subjected to what Paul Rutherford calls “a new global regulatory order” (Rutherford 1997: 555).

It may be that protection and regulation of wildlife are forms of marginalization. Most wildlife management protects species populations at reduced levels. We live in an age that is increasingly defined by the loss of wildlife and biodiversity, where the rationale for managing wildlife is to protect and preserve species as they move into endangerment and toward extinction. According to James Gustave Speth, twenty-four per cent of all mammals, twenty-five per cent of all reptiles, and thirty per cent of all fish species worldwide are threatened (Speth 2004: 15). Yet management rarely enables these species to recover to anything like their former abundance. Instead, concepts like “Minimum Viable Populations” or, in the case of fisheries, “Maximum Sustainable Yield,” mean that wildlife populations are managed at far below historical levels.

Management is not only a way to monitor populations of wildlife whose numbers have declined, but it is also involves “disciplining” the exceptional wildlife species whose numbers may have recovered enough to create new problems. The gray wolf and the red wolf of North America are examples, both officially classified under the U.S. Endangered Species Act. As they have been reintroduced in their former ranges, and as their wild populations have recovered, they must be closely monitored to avoid conflicts with humans. “Problem wolves” are “translocated”—which usually means removed. I have argued elsewhere that endangered animals are in a sense the totemic creatures of modern culture, a category of wild animal that we have created (Bergman 2003). The contours of the changing limits between wildlife and humans are complicated, yet radio-telemetry plays an important role in their regulation, management, and “policing.”

The Disappearance and Simulation of Animals

It is an odd sensation to follow an animal through a Central American jungle with radio-telemetry. I have done it with many wild creatures, from macaws to jaguars. As with the great green macaws that we released with a new radio-collar, we could pick up the “beep” or
“ping” of the animal from its hiding place in the canopy. It was not far from its nest, but out of sight. Yet we knew from the steady sound of the receiver, on the frequency dial “7.6”, that the bird was still present. But it was invisible, suddenly no more than the coded patterns of electronic stimuli on a radio receiver.

If radio-telemetry institutes an increasingly pervasive form of surveillance over wildlife, it is not exactly the same kind of surveillance described by Michel Foucault. For Foucault, surveillance is based on vision, and the technologies of vision. The lens is its principal metaphor, and optics is its science. His gaze works on visible bodies. In radio-telemetry, the surveillance is only secondarily visual. I have been on biological studies in which the team tracked the wild animal with its radio-signal to see it and capture it. In fact, however, the great value of the radio-telemetry technology is that, except for occasional instances, it eliminates the requirement that the animal be seen. It follows or “tracks” the animal, except that no “real” tracks or traces of the actual animal are followed—no tracks in the mud, no leftover litter from a meal, no broken branches. Even on foot in the jungle, what we follow is not the sign of the animal itself, but the invisible radio-wave that is captured in a sound on a radio-transmitter.

Not all animals are studied with radio-telemetry, and radio-telemetry does not define all aspects of the studies that do employ this technology. But as telemetry has become more pervasive and widespread, one has the feeling, listening to the animal send signals of itself through the invisible spaces, that one is experiencing a wild animal at increasing remove. All experience is mediated, but with radio-telemetry one listens to the signs of a sign of an animal: the “ping” of a radio-wave of a radio-transmitter on an animal that cannot be seen. The animal seems to have become a beast with no body, a simulation of itself.

In Simulacra and Simulation, Jean Baudrillard describes simulation as the process by which representations and models of reality in a post-modern culture supplant the things themselves. The level of distance and detachment has become so great that signs are disconnected from the reality they represent, and in the process come to be preferred to the thing itself. Baudrillard distinguishes between representation and simulation. In representation, the image is a counterfeit of the real, an illusion that nevertheless is connected to the real. Paradoxically, it can be used to confirm the existence of the real, since it implies the existence of the thing that is represented (Baudrillard
1994: 12, 24). This is what he means when he says that the imaginary can be used to “prove” the truth of the real. It testifies to a faith in the real. In simulation, however, signs and other forms of representation no longer connect to the real. They have displaced it. Simulacra are the images that have lost their contact with reality, and have become their own order of reality, which Baudrillard calls *hyperreality*. They come to precede and even determine reality. Thus he speaks of the “Precession of Simulacra”: “the territory no longer precedes the map, nor does it survive it. It is nevertheless the map that precedes the territory—the precession of simulacra—that engenders the territory” (Baudrillard 1994: 1). In postmodern culture, we live in a world without depth and without origins. The underlying meaning of images, the reference point, has disappeared. The real however is constructed by and confused with the image.

The photography of animals in *National Geographic*, the programs of wild animals on the public television station, and what Baudrillard calls “the hell of zoos” (133)—these can operate as a kind of nostalgia; representations that console us with a belief that the real animals they represent still exist. Nature is expected to live up to its photographic images or dioramic presentations. As Baudrillard says, “for a long time the animal order has been the order of reference. Only the animal is worth being sacrificed, as a god... Men qualify only by their affiliation with the animal: the Bororos ‘are’ macaws” (133). That order of reference has largely vanished, so that the image increasingly displaces the thing itself. Perhaps wild animals are not needed, if zoos can preserve a few representatives. Baudrillard offers the cave of Lascaux as an example of the way the duplicate has first displaced, and then grown indistinguishable from, the original. The public access to Lascaux is restricted. In its place, people can witness the replica built nearby. People visit the copy of the cave of Lascaux, and in their minds the copy displaces the original, which they cannot see: “the duplication suffices to render both artificial” (9). Likewise, editors and park rangers become the purveyors of a fantasy of nature.

I do not want to press this point too hard, but radio-telemetry seems to contribute to the way, as Baudrillard says, “the real is confused with the model” (29). In radio-telemetry the animal that is the vehicle of the electronic transmissions is little more than a source of information. The traces of the animal itself are so faint as to suggest that the animal is announcing its own disappearance in the electronic...
sounds on the receiver. Animals as physical beings seem to vanish. A postmodern body-snatcher has made off with the creature, and left its signals as evidence. It seems an important turning point between the representation of animals and a new kind of simulation. Baudrillard writes: “The transition from signs that dissimulate something [that is real] to signs that dissimulate that there is nothing marks a decisive turning point. The first reflects a theology of truth and secrecy... The second inaugurates the era of simulacra and simulation, in which there is no longer a God to recognize his own...” (6). In other words, as we move further from the real, and as simulations displace the real, the ground of meaning in the real disappears.

What is striking is that the disembodied animals that come through a radio receiver seem to announce in another way their entrance into a world of simulation. Their signals frequently describe a double disappearance. Not only have the wild animals being studied disappeared from sight, but they are increasingly creatures that are disappearing from life. According to Baudrillard, animals become simulacra when they announce their own absence. Their signals in these studies are often signs of their endangerment or even approaching extinction. These animals enter the world of simulacra not only by the technology that translates their signs, but also by becoming signs of their own disappearance.

Baudrillard describes the process in which wild animals are transformed by civilization into a simulation of themselves that survives themselves:

The convergence of processes of civilization is astounding. Animals, like the dead and so many others, have followed this uninterrupted process of annexation through extermination, which consists of liquidation, then of making the extinct species speak, of making them present the confession of their disappearance (Baudrillard 1994: 136).

One should not miss the truth of this assertion for the sweep of its exaggeration. Paradoxically, wild animals are increasingly marshaled into our media to tell the story of their endangerment and extinction, and are left behind only as simulacra to tell us of their leaving. We have, it seems, increasing difficulty in telling the difference between the diminished beast and the real beast.
Conclusion

In this paper, I have suggested that radio-telemetry, while a technology that appears to offer significant advances in both knowledge and the management of wildlife, is not wholly innocent. It is an expression of, and serves the interests of, large social forces at work in redefining our relations with wild animals. The category of animal that perhaps best defines our own relationship with animals is “endangered.” It is a category that defines us; a uniquely modern way of thinking about animals. It customarily is understood as a category that testifies to our desire to save animals. “Endangered” signifies a culture’s willingness to protect an entire species and work for its recovery. Yet even as increasing numbers of animal species vanish and demand their own studies and protection, some other species, fewer in number but important in their impacts, become problems of abundance. They too must be controlled, studied, solved. Radio-telemetry is deployed along both these shifting new boundaries between human and wild animals as a technique of both knowledge and control. It suggests in its model of surveillance and management that in certain measure wildlife biology may unwittingly become the agent of broader social forces at work, relegating animals to endangerment and extinction, even as they mean to save them. And by contributing to a reconstruction of animals as statistical composites of disembodied beings, radio-telemetry may also be helping in the displacement of more and more wild animals into a shadowy world someplace between sign and referent, between being and their own extinction.

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Notes

1. For additional information on these radio-telemetry studies, see Bergman in the references to this paper.
2. Of course, one of Foucault’s key points is that surveillance (as in the Panopticon) ultimately had the effect of causing those exposed to it to police themselves. Clearly—since neither natural places nor individual wild animals will understand that they are being surveyed—they will not respond by self-policing; in this way surveillance of the wild is somewhat different from surveillance of people.
References


