A reprint from: *HSUS News*, Fall 1991

Wildlife Contraception

A New Way of Looking at Wildlife Management

By Dr. Jay F. Kirkpatrick

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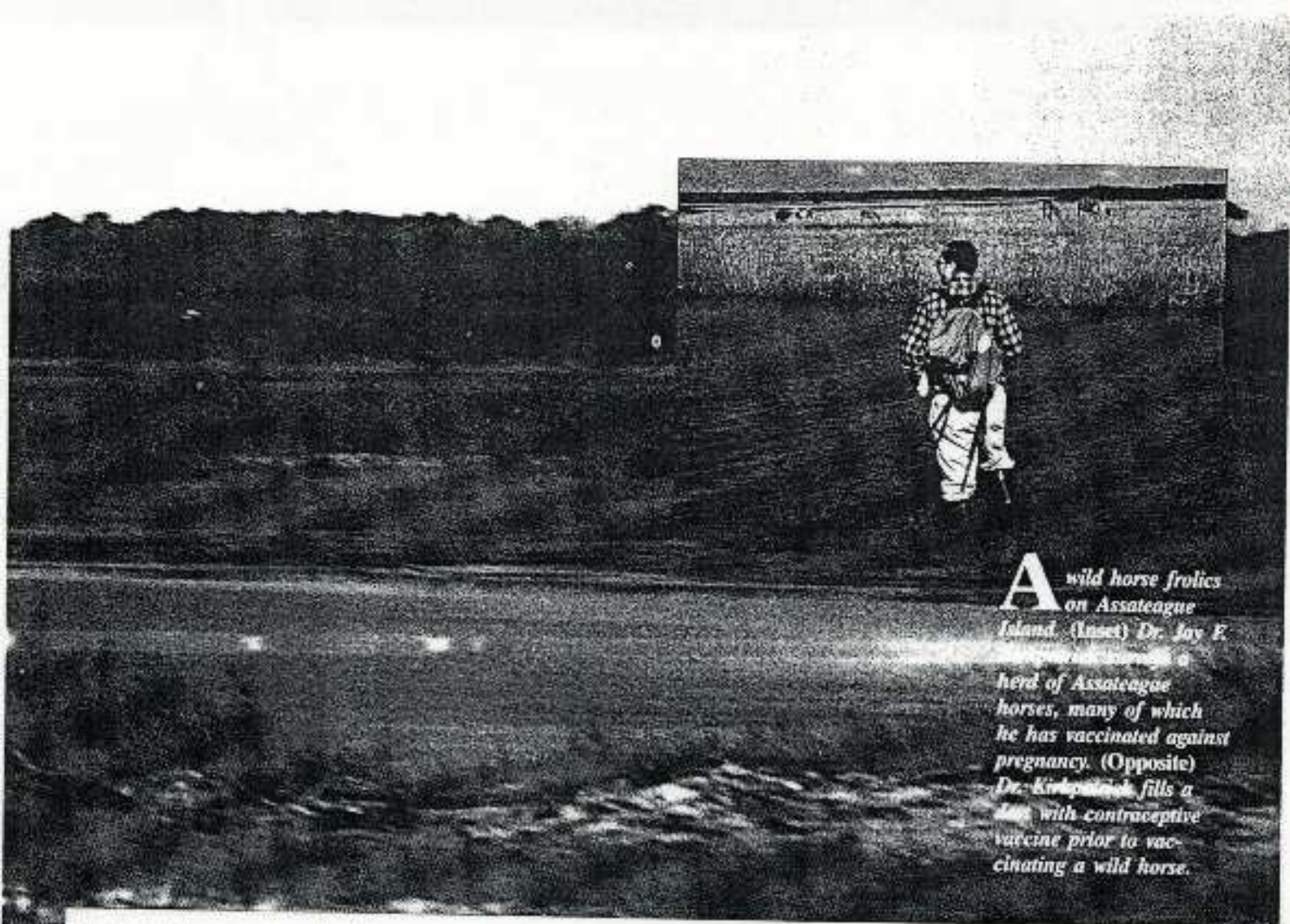


A wild horse frolics on Assateague Island. (Inset) Dr. Jay F. [illegible] herd of Assateague horses, many of which he has vaccinated against pregnancy. (Opposite) Dr. Kirkpatrick fills a dart with contraceptive vaccine prior to vaccinating a wild horse.

that complete protection afforded to the wild horses would lead to an uncontrolled population increase.

Since the social structure of feral horses is highly developed, a single sexually mature stallion impregnates anywhere from one to ten mares each year. From 1972 to 1980, my colleague, Dr. John Turner, of the Medical College of Ohio, Anne Perkins, a Montana State University graduate student, and I carried out a series of experiments designed to promote contraception in stallions.

We administered a microencapsulated form of the male sex steroid hormone testosterone to stallions in the wild-horse herds near Challis, Idaho. Given in large doses, the steroid lowered the stallions' sperm counts and decreased sperm motility. In our field study, stallions were first immobilized by darts shot from a helicopter. Then the contraceptives were administered by hand. The mares bred by those stallions had an 83 percent reduction in foal production. Although the contraceptive treatment was pharmacologically successful, we were disturbed by the need to capture the wild stallions, a procedure that was hard on the animals, and by the prospect of steroidal hormones passing through the food chain. Eventually when those horses die, scavengers such as the golden eagle will consume their carcasses. The effects of steroidal hormones on such animals are not known.

With the appointment of James Watt as Secretary of Interior, feral-horse contraception research came to a halt. The feral-horse dilemma became worse in the next five years, as costs for the Adopt-A-Horse program increased. More than 20,000 horses were captured and confined in government corrals as the rate of reproduction increased among the horse herds on public lands.

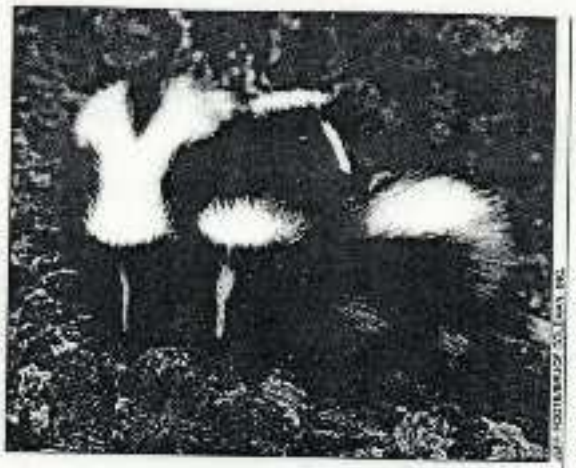
When Dr. Turner and I went to Assateague Island we tried two different approaches. First, we repeated our experiment with microencapsulated testosterone, using remote delivery this time. We administered the testosterone to several stallions, using darts. A year later there was a moderate reduction in the number of foals born on the island. However, in order to deliver a sufficient volume of the drug, each stallion had to be darted four times. The cumbersome logistics of this approach made it clear that it had little utility as a management tool.

We also used darts to prevent pregnancy in the mares by delivering a slow-release microencapsulated form of a contraceptive called progestin. (It's an ingredient in several human contraceptives.) The steroid prevents ovulation in most mammalian species.

The results were scientifically significant but not exactly what we had in mind. One hundred percent of the treated mares produced foals. It turned out that we had discovered a wonderful fertility enhancer!

Despite this setback, we learned valuable lessons from our studies. They pointed the way to a new approach. In 1987 Dr. Turner and I joined forces with an expert in equine immunology, Dr. Irwin K.M. Liu, of the University of California at Davis. We literally threw out fifteen years of work with

zoos; Assateague horses live a normal life after being vaccinated against conception. Only one foal in four years has been born to inoculated mares.



life contraception, Carrie Bickle, a student of mine from Eastern Montana College, has successfully controlled populations of skunks with small, commercially available contraceptive implants recently approved by the FDA for use in humans. Over a two-year period, the city of Billings, Montana, captured and destroyed hundreds of skunks in order to control the spread of rabies. Animal-control officials found that as soon as the skunks were removed, new ones moved in from the surrounding county. We developed a strategy based on maintaining a core population of skunks that would defend their territory but could not reproduce.

In initial tests, funded by the Eppley Foundation for Research, PNC Corporation, the Animal Welfare Institute, and Sally Hunter, of Alexandria, Virginia, Ms. Bickle live-trapped female skunks and lightly anesthetized them, working with a pole syringe. It was a tricky business, but luckily the skunks scored only a few direct hits! After having a small patch of fur shaved from their necks, the skunks each had a single small contraceptive implant placed just under their skin. The implant, known commercially as Norplant®, is so small it can be placed under the skin without surgery by pushing it through a large hypodermic needle. After the disinfecting of the small puncture wound, the skunk is up and on its way.

After three years of testing, this approach has proven to be 100 percent effective in preventing pregnancies in skunks. The technique was so simple that animal-control personnel learned the procedure in minutes; no surgery was required. The program may seem to be a great deal of work, but not when you consider the numbers. Every ten skunks treated represent sixty to seventy skunks that will never increase the population. Even better, no animals were killed. We plan to test a similar vaccination program on raccoons as soon as funding is obtained. Other researchers have found that Norplant® contraceptives work well on rodents.

As contraceptive programs move forward, new applications for wildlife must follow. In addition, there are one-inoculation PZP vaccines to be developed and entirely new vaccines to be researched and applied to wildlife situations. For example, research teams at universities in Connecticut and Virginia have identified anti-sperm antigens that, when injected in male animals, cause antibodies against sperm. Such vaccines would be particularly useful in species like horses, where a single stallion breeds many mares.

With each advance in wildlife contraception, however, comes greater threats of abuse of this technology. Should contraception ever be used in an endangered species? If so, under what conditions? Who should make the decisions about the use of contraceptive technology on wildlife, using what criteria? What are the allowable limits of stress to which animals should be subjected in order to apply wildlife contraception? Such questions must be answered before fertility control becomes a common wildlife-management tool. There is a multitude of ethical and moral questions to consider if we are to solve wildlife problems rather than make them worse. We have already begun to ask such questions and to develop responsible and ethical guidelines for wildlife contraception.

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Last March, while giving the fourth annual booster shot to the Assateague mares, I came upon the carcass of an old friend. This mare, M4, was twenty when she died of natural causes in December 1990 at almost the northernmost terminus of the island. Her remains were still pretty much intact and I could still see her white socks and the star on her forehead. There were two small depressions in the sand where she had pawed vainly after going down, but the depressions were shallow and I don't think she suffered long. She had been among the mares originally inoculated in 1988 and she was special to us. I briefly laid my hands on her neck, something no human had done during her twenty years. She died less than a mile from where she had been born, and she had never been roped, captured, rounded-up, immobilized, or otherwise harassed, my contraceptive darts notwithstanding. M4 was born wild and lived free. She was permitted the dignity to die where she lived. I am a scientist, but my emotional self mourned her loss. For a few moments, in my grief, I lost sight of the fact that I should have been celebrating her life and not mourning her death. I almost lost sight of the tribute her life—and death—represented to the bold Park Service officials on Assateague who elected to find a humane solution to managing this herd of wonderful animals. I almost missed the whole picture. ■

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