





Bill Clark

THE CAPTORS

After years of erratic experimentation, wildlife managers have begun to perfect the practice of capturing and relocating rare and endangered animals.

BRINGING THEM BACK ALIVE

ERIC HOFFMAN

Descended from animals captured and transplanted from the Owens Valley, a bull tule elk (left) grazes in the San Luis National Wildlife Refuge in the San Joaquin Valley. The dried grass became tangled in the bull's antlers while he clashed, heads-down, with other males during the rut, or mating season. At the same refuge (above) a bull elk stands guard over his harem of cows.

SMACK IN THE MIDDLE of nowhere—in the vast, drab high desert at the north end of the Owens Valley—sits a collection of dusty California Department of Fish and Game four-wheel-drive trucks, immense goose-necked horsetrailer, stacks of medical supplies, and a small tent city inhabited by veterinarians, wildlife pathologists, cowboys, university students, Conservation Corps workers, a handful of spouses, and a few hardy members of the press.

It is an unlikely collection of souls, all of whom are about to take part in the even more unlikely feat of capturing, in one fell swoop, 100 of the 500 free-roaming tule elk that live in and around the Owens Valley. The elk will then be moved to parks and sanctuaries throughout California.

If the skittish elk get a strong scent of humans, they'll scatter before reaching the trap. The week's work will be lost and the tight budget squandered.

Long before the rest of the capture team has risen, Bill Clark and the program's other mainstay, veterinarian Dave Jessup, have joined helicopter pilot Don Landells for one last predawn review of the capture plan. Under the light of a lantern, they pore over a topographical map and discuss the latest uncertainty that could spell success or failure.

The wind has shifted and is now dangerously close to blowing straight up the ravine from the encampment to the elk. If this happens it would be nearly impossible to drive them into the trap. If the skittish elk get a strong scent of humans, they'll scatter before reaching the trap, and the week's work will be lost and the tight budget squandered. A decision must be made: Should the captors stick to the game plan, which calls for herding the elk directly down a ravine they commonly use and into the trap? Or, should they attempt to move the animals over a circuitous route that would take them out of the path of the fickle wind, but in the process could scatter the herd?

Clark and Jessup, who had become proficient at darting and safely capturing elk from a helicopter, have talked their superiors into trying this first-of-a-kind elk drive to save money. The expense of operating a helicopter, and the inefficiency inherent in darting one animal at a time and attending to its resuscitation, plus its relocation, had been running an exorbitant \$1,000 to \$2,000 per animal. In addition, elk collected randomly from different bands and placed in a new location often did not form cohesive herds, because the subtle governances of the herd's hierarchy had been irreparably shattered. If the drive plan worked, the total cost per animal would run about \$200, and chances were excellent that the released animals would form a socially healthy herd.

When the 5:15 reveille is sounded, the

change from night to day is first evident in the west, where 14,000-foot peaks of the southern Sierra Nevada change from ash-en silhouettes to lavender beacons of new light. In the darkness of the high desert, bulky figures adorned in chill-reducing parkas and knit caps emerge from their tents. Muttering hellos and complaining about the all-night chorus from a band of coyotes, they gulp down coffee and head toward the corral trap.

At 5:45 Clark addresses his bedraggled troops. There is a smattering of green and khaki uniforms of the Department of Fish and Game officers. There are wind-worn cowboys with their horses in tow, scraggly bearded university students, an assortment of biologists, volunteer veterinarians, and conservation workers from California's inner cities.

THE MOOD IS SOMBER, not unlike that in a team locker room before a high-stakes contest. Clark is reassuring and emphasizes the importance of working as a team. Even though the whole operation has been carefully rehearsed, there are a few questions born of nervousness about what to do when the unexpected happens. Clark ends the talk with the two thoughts most on his mind:

"No matter what happens, don't become heroic and endanger yourself. And, if one of you, just one, decides to stand up and take a leak and the elk see you, we're finished. So, stay put until you get the word, even if it seems like hours."

All disappear to their assigned hiding places. The trap, for a week of beehive of activity, looks deserted. It has the appearance of a sturdier, earth-toned version of Christo's "Running Fence," a temporary sculpture that bisected rural Marin County a decade ago. Landells fires up his helicopter, and the engine's loud rhythm emphatically rattles the last cobwebs from

the groggy participants' minds. The pitch changes and then Landells lifts off; in a short time the helicopter looks like a giant angry bumblebee as it races to and fro over the pale landscape in search of elk.

Clark holds Landells in high esteem. "Landells knows the animals he guides better than they know themselves, and it's because of his sixth sense that we're confident he'll be able to herd the elk." From his aerial perch Landells must be able to pick the herd's leaders and must likewise read and anticipate their actions. He plays a cat-and-mouse game by annoying the elk into moving in the direction of the trap, but he is careful not to panic the herd into breaking up. When the elk begin to run, Landells backs off and allows them to regroup. When they detour away from the trap, he slowly hovers across their path. After thirty minutes he has maneuvered the herd of nearly 100 animals into the wings of the trap.

The lead elk see that their rocky terrain has changed into a burlap-covered edifice. The weak-sighted animals lift their broad noses and turn their oversized ears toward the trap, groping for a scent or a noise that will give them a hint of what to expect. But the worrisome wind has shifted in favor of the would-be captors, and the elk get no clues.

Before the lead animals have time to ponder what lies before them, and before most of the herd even realize they're entering the wings of the funnel-shaped trap, Clark forces them to react. He radios Landells to descend slowly behind the herd and signals the hidden "Cavalry." The cowboys trot out of their hiding places, form a picket line, and slowly close in on the herd. In the split second that follows, the project's success hangs in the balance.

The elk can reverse themselves and run through the horsemen, which they would predictably do if they felt there was no

Surveyed from the cockpit of a low-flying helicopter, a group of Owens Valley tule elk are herded toward a camouflaged trap. Practice and hair-trigger timing enable wildlife managers to outwit the skittish elk, bringing them safely into the burlap-sided pen.

other route to safety. But Clark and company have built in a deception that plays to the elk's poor eyesight. The burlap at the rear of the trap has been peeled back from the mesh fence to give the elk a view that appears to be an escape route. Seeing the horsemen, the elk at the back of the herd trot past the lead animals, further committing the herd to the funnel. The collective mind of the herd is now clearly confused, and within seconds the tension in their muscles explodes like a huge spring.

Most of the herd race down the funnel, but as they get close to the corral they begin to slow and look back as if they might reverse course. Clark radios the "Coyotes." From their hiding places in the wings, twenty people fan out behind the herd, while horsemen dance along behind them. Again the elk at the rear, seeing still more humans, push into the back of the herd, compressing it into a tight mass of flashing hooves, white under-bellies, and tawny coats. With their calves protectively pressed into the middle, the herd catapults into the corral and heads straight for the false opening. Clark orders the "Jerks" hiding outside the back of the corral to jerk shut the burlap before the elk hurl themselves into the mesh fence. Simultaneously, Clark releases the curtain gate that seals the entrance. And so, smoothly conned and out of sight of their captors, nearly 100 wild elk stand about calmly. A few stragglers left outside in the funnel are given wide berth as they reverse their field and race along the burlap wings to freedom.

There are no whoops of joy from the captors; instead, there are a few victory signs, warm handshakes, and pats on the back—but everyone talks in whispers. It is paramount that the elk be kept calm. Dave Jessup and his team of volunteer veterinarians and vet students begin processing animals. Working from behind partitions, they are able to draw blood and



Jeanne Clark



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collect fecal matter, as well as innoculate and tag animals. The blood and fecal matter are rushed off to the Wildlife Investigations Laboratory in Sacramento for a full assessment of each animal's health before the elk are released in their new homes in places like Point Reyes, Grizzly Island, San Luis Wildlife Refuge, Concord Naval Weapons Station, and the Mount Hamilton Range.

While Jessup and his team are at work,

Clark boards the helicopter with this tranquilizer gun and whirls off to dart a few solitary mature bulls so that each new herd can have a sire. One at a time, Clark and Landells bring back massive bulls suspended under the chopper. Once on the ground, the bull elk are doused with water to keep them from overheating, relieved of their cumbersome antlers, and then loaded into a trailer. There, an antidote to the tranquilizer is administered to



Mike McWherter

To spread the living wealth of growing herds of bighorn sheep in the Sierra Nevada, Fish and Game biologists had to employ a technique different from that used to capture tule elk in the Owens Valley. Near Mount Baxter, a group of Sierra Nevada bighorn rams (*Ovis canadensis ssp. californica*), gather in a protective grouping, alert to possible danger. This instinctive wariness makes bighorn sheep difficult to capture, especially in the mountains' rugged terrain.

Two other subspecies of bighorn sheep inhabit regions of California: the Nelson bighorn (*Ovis canadensis ssp. nelsoni*), of desert regions; and the peninsular bighorn (*O.c. cremnobates*), of the Peninsular Ranges of southern California. Hunting, habitat loss, grazing competition from domestic livestock, and exotic diseases led to dramatic population declines last century.

revive them.

Thirty-six hours after having been trapped, the elk stand on hospitable acreage in areas of California that have harbored only their ancestral ghosts for 150 years.

TULE ELK, the smallest subspecies of the American elk, *Cervus elaphus ssp. nannodes*, are native only to California, and until the coming of Europeans in the 1800s they were to the Central Valley what buffalo were to the Great Plains. But their former existence in large herds throughout California doesn't explain why the California Department of Fish and Game goes regularly to the high desert to trap them, nor does it explain what a forest and grasslands creature is doing in the desert in the first place.

In 1873 only a single pair of tule elk had survived the onslaught of market hunters and the settlement of the Central Valley. The last pair was found on "Cattle King"

Henry Miller's huge San Joaquin land holding; and luckily for the animals, Miller went to great lengths to protect them from poachers. They survived and reproduced, and eventually, for lack of any other home, a herd of fifty-four was dumped off in the Owens Valley in the 1930s.

Even before Europeans arrived, elk had never lived in the Owens Valley; and if they had had a conscious opinion, they would not have picked it as a home. The valley, however, now provided the one thing they couldn't be given elsewhere: space to roam. By raiding irrigated alfalfa fields and browsing over large areas of desert shrubbery, the herd survived and grew. As their numbers increased, so did complaints of crop damage from Owens Valley farmers. Yielding to farming interests, when there weren't more than 400 tule elk left in the world, the California Fish and Game Commission organized hunts. In the 1955 hunt, gunmen shooting from jeeps into stampeding herds killed

Wildlife managers lure wary bighorn sheep with savory alfalfa spread out beneath “drop nets” (right)—strong nylon mesh suspended from posts and released with radio-detonated blasting caps fixed to the suspension lines. The sheep are captured in an instant (below).

and maimed nearly half the elk in the Owens Valley.

The revulsion voiced by conservationists and hunters led to years of ugly wrangling between those who wanted hunting, as a way to reduce crop damage, and those who wanted none, for the protection of the species. The debates held before the California Fish and Game Commission finally ended when in 1971 the California state legislature passed what is now known as the Behr Bill. In essence, the law ordered the California Department of Fish and Game to remove elk from the Owens Valley whenever the population of elk exceeded 490 animals. Based on ground-breaking work by Michigan congressman John Dingell, California congressman Pete McCloskey authored parallel federal legislation opening federal lands for releases of surplus animals. (California senator Alan Cranston introduced the bill in the Senate.) The only catch was that when the law was passed no one had the expertise to capture and move large numbers of free-roaming elk. Fish and Game scientists assigned to the task found themselves trying to learn, as wildlife pathologist Bill Clark likes to put it, “with the media perched on one shoulder and conservationists on the other.” Clark became accustomed to scrutiny and even accommodates it. For this morning’s important capture he made sure a blind was built to enable the press to watch the first attempt to drive a herd into a trap.

At first, the singular legislative directive of the Behr Bill, which had been designed to accommodate the existence of more elk and to establish herds in historic ranges, unceremoniously pushed the state of California into the uncharted area of live capture of elk. At the time, despite rosy pictures painted by television programs like *Wild Kingdom*, 50 percent mortality rates were common in live-capture



Rob Roy Ramey II



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operations. In the hard reality of wildlife management, new herds could be established—provided that there were plenty of animals to compensate for high losses. But when the numbers of a species are low to begin with, live capture becomes a high-stakes game. When Clark, Jessup, and an ever-changing cast of Fish and Game biologists kept catching, doctoring, and transporting hundreds of rare elk with less than 3 percent mortality, live

capture suddenly had an expanded meaning. It has since become a pervasive wildlife management tool that, in the opinion of many wildlife experts, is the single greatest boon for replenishing and redistributing rare species since the concept of setting aside parks as habitats free of humankind’s indiscretions toward other life forms. But before live capture became a tool for handling bighorn sheep, pronghorn antelope, and deer—as well as elk—



Rob Roy Ramey II

Blindfolded and hobbled, a bighorn ram is injected with a tranquilizing drug following capture near Mount Baxter in the Sierra Nevada. The ram will become an important genetic contributor to a new herd to be established elsewhere in the Sierra.

about an inch above a hoof. I figured out later that the helicopter's prop wash pushes the projectile down a couple of feet when it leaves the gun. We've learned to compensate."

Jessup, who was hired shortly after Brian Hunter took an administrative post, explains, "The more we worked at it the better we became. Attending to every contingency and every detail often makes the difference between success and failure. When working with wild animals you have to learn to expect the unexpected and then be ready to deal with it."

PERHAPS THE BIGGEST frustration came not during the learning process, but at the hands of the cumbersome interagency bureaucracies that often aggregate around an imperiled species when there are plans to tamper with it.

In the 1970s the California Department of Fish and Game purchased twenty-six bighorn sheep from British Columbia and moved them to a 430-acre enclosure in Lava Beds National Monument near the northeast corner of California. Slowly, the herd grew to forty-three animals. In 1980 an attempt was made to capture the sheep and move them to the nearby Warner Mountains. The project was headed up by five agencies: the Bureau of Land Management, National Park Service, U.S. Fish and Wildlife Service, U.S. Forest Service, and the California Department of Fish and Game. Each agency selected a different project manager, none of whom had experience in capturing bighorn sheep. In part, because jurisdictional responsibilities weren't clearly defined, no single person was empowered to make critical decisions if things went awry.

Things went awry with a vengeance. The plan was simple enough. A helicopter would herd the sheep to one end of an enclosure, where men would pounce on

them and ready them for transfer. But the helicopter pilot, a newcomer to wildlife capture, had outfitted his machine with sirens and firecrackers that he supposed would help him with his task. As it turned out, the panic he created caused some sheep literally to run themselves to death. After five hours of chasing sheep all over the enclosure, sixteen were caught. Ten promptly died from capture myopathy—a kind of shock and cellular breakdown created when oxygen-starved muscle cells consume themselves and release acids that poison the body. Of the six sheep to survive capture, two died later of capture-related problems. Four were eventually released in the wild, and the entire herd that hadn't been caught died later from unknown causes (possibly, diseases caught from domestic sheep that shared a common fence).

Unfortunately, the men with the expertise, Jessup and Clark, had been relegated to providing medical care for captured sheep and were left out of decisions concerning capture.

Jessup says, "Capture is the most critical moment when the best medical skill must be put into motion: minimizing stress, making sure the correct dosage of any drug is given correctly, and continually monitoring the animal's temperature and overall reaction makes the difference between life and death."

Says Clark, "We performed a lot of last rites that day. Waiting at our station, we were brought sheep that were dying. We could do little to help them."

Jessup: "It was awfully frustrating, because we knew the more the animals were run the less their chances."

This botched job drew negative publicity to all the agencies involved. California Department of Fish and Game's Dick Weaver, who is the in-house expert on bighorn sheep and who had just finished the first comprehensive census of bighorn

there was a period of painful struggle and frustration.

The Department of Fish and Game's first attempt to catch elk ended in three deaths for the five animals captured. That's when young pathologists Brian Hunter and Bill Clark got a call from then-department chief Ray Arnett.

"In essence we were asked to become instant experts," says Clark. "We visited people at the San Diego Zoo, UC Davis vet school, and wildlife managers in Wyoming who worked with elk and found that not much was known about capturing them. In most cases we ended up teaching ourselves. We had to come up with a safe immobilizing drug. And since everyone said elk couldn't be herded, we worked on ways to dart them from a helicopter."

Clark remembers his first attempt to dart some elk: "ABC [the television network] asked to come along. With a camera rolling over my shoulder I fired and missed. My second shot hit the animal

Against the backdrop of the eastern Sierra Nevada a helicopter lifts off bearing a cargo of sedated bighorn sheep to a base camp. Given a medical exam and allowed to revive, the sheep will be loaded into horsetrailers and released in a new area.

throughout California, believed, as did Clark and Jessup, that with bureaucratic changes, live capture of bighorn would work. Understandably, Weaver ran into some reluctance from his superiors when he outlined another try—especially since this attempt to create new herds of rare Sierra bighorn would draw on the mere 200 or so animals that survived, mostly in one herd. Weaver, with the backing of Clark and Jessup, argued that red tape and bureaucracy should be streamlined and that capture strategies should be carefully worked out by those with expertise. The green light was given.

Clark and Jessup got together with pilot Don Landells and worked out a series of strategies designed not only to catch sheep but also to serve as training exercises for other personnel. Says Jessup, "Each species has a different chemistry, flight reaction, and lives in different terrains. Consequently, every strategy is different. You bank on what you've learned, but you must remain flexible to build a plan that works for a particular situation."

They decided the safest and most economical strategy for catching bighorn was to use drop nets made of strong but light-weight gill-net material designed to catch salmon. In a series of outings they caught more than sixty sheep in the Sierra, thirty-one of them in a single afternoon, with only one death. As a result there are now five growing herds of Sierra Nevada bighorn far apart from one another in areas the sheep wouldn't have recolonized on their own.

Next they moved to desert bighorn. By siphoning off animals from large herds, they were able to create herds in areas reclaimed from feral burros that had been rounded up to make way for bighorn sheep. Now they've expanded their repertoire to include pronghorn antelope. Drawing from the last California population, they've created one new herd in east-



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ern central California, and if the habitat assessment turns out as predicted, by fall 1985 there will be a herd of pronghorn antelope in southern California for the first time in more than a hundred years.

Although much of the thrust of the live-capture program has been to create new populations, the technique has also become useful in preserving declining populations. In the Santa Rosa Mountains, near Palm Springs, bighorn lambs

were not living longer than a few months after birth. Necropsies of dead lambs pointed to pneumonia as the culprit, but unless live animals could be studied to determine what disease had weakened the lambs enough to bring on the pneumonia, the herd would most likely perish. Blood taken from Santa Rosa sheep showed blue tongue and parainfluenza, two serious livestock diseases that pass through an animal in a few days but leave

Reproducing social groups of both tule elk and Sierran bighorn sheep (facing page), with adult males, females, and young. California's once-rare tule elk are now on the verge of overwhelming the available public-land habitat, and pressures for hunting are increasing.

it susceptible to secondary infections. Experimental vaccines have been given to these sheep in recent months with the hope that future lambs will survive. Says Jessup, "At least live-capture has allowed us to figure out what is wrong before it was too late. Now we stand a good chance in turning things around. Twenty years ago diagnosis would've been nearly impossible."

In the course of crisscrossing the state to capture animals, Clark and Jessup have had some memorable experiences. Clark remembers the time he almost fell from a helicopter when his safety strap worked loose as he leaned out to dart a bighorn sheep. Jessup remembers volunteering to help authorities round up a couple of young bears that had mysteriously wandered into Los Gatos, near San Jose. When he arrived with his tranquilizer gun he found himself working amidst a heavily armed, somewhat fidgety SWAT team that seemed to think the bears were monsters akin to Godzilla.

One mission of mercy stands out above all the rest. When Angel Island in San Francisco Bay became overpopulated with deer in danger of starving, San Francisco SPCA chief Richard Avanzino filed suit against the California Department of Fish and Game and other agencies that had requested the SPCA's cooperation in removing the Angel Island deer and releasing them in Mendocino County. Some Fish and Game scientists had been reluctant to relocate these deer because of the expense involved and the likelihood that the animals wouldn't survive. On the island the deer had not experienced predators, dogs, fences, traffic, or hunters. In addition, many of the animals were tame and were accustomed to mooching hand-outs. Even so, the deer were facing serious food shortages in their finite habitat. Proposed solutions to the imminent starvation had ranged from sterilization, to a

culling hunt, to introducing coyotes to the island and then letting nature take its course.

The suit and political finagling that followed set in motion the capture and relocation plan, which Fish and Game technicians then carried out successfully. But a follow-up study by UC Berkeley professor Dale McCullough and his students found that the deer suffered at least a 64 percent mortality at the hands of the forces they'd never encountered on the island. What was billed as an humanitarian act turned out to be an expensive humanitarian gesture. Clark says, "Instead of taking the coyotes to the deer for next to no cost, we took the deer to the coyotes for about \$100,000. I can't say it's the most logical thing I was ever involved in."

Because of the California Department of Fish and Game's success in live captures, Jessup and Clark now find themselves training federal and state wildlife managers nationwide in how to catch everything from mountain lions to sea otters. Bill Clark is careful to point out that he sees himself as a catalyst and does not like being put on a pedestal.

"We've helped develop a new management tool, but without the cooperation of other agencies and biologists at the regional levels, who assess habitats and help in captures, we wouldn't have accomplished a thing. What makes me happiest is to turn on a television set and see someone catching bighorn or elk in Colorado or Utah and know we trained them."

Jessup agrees, but he is cautious: "Sure, I'm proud of what we've accomplished, but Mother Nature is still in charge. Without healthy habitat, all the technique in the world won't mean much. With a little over sixteen hundred tule elk at sixteen different sites, the question of finding enough room for them is already an issue." ❁