Trend Spotters

When FWP biologists count wildlife, they're learning which direction populations are moving.

BY DAVE CARTY

Jerry Brown has been in this helicopter since shortly before sunup. It's his second straight day of flying the west Cabinet Mountains, and the FWP wildlife biologist is getting ready to call it a day. Thirty-two years of surveying wildlife from helicopters and airplanes will do that to a person. Below him, a group of mountain goats scrambles for cover, and Brown signals for the FWP pilot in the seat next to him to bank and then circle in for a closer look. The goats scramble up out of the basin then over the ridgetop.

"We're looking for kids," he says. "That way we can determine this year's reproductive success."

Each summer on the last week of August, Brown flies a prearranged route through the Cabinets: one side of the mountains one year, the other side the next. He and the pilot look for black and grizzly bears in the open huckleberry patches and for mountain goats on the cliffs above. Brown says renting helicopters is expensive; to save the department money, he schedules surveys covering more than one species. He's looking for young goats, but Brown is also counting every adult goat he can see—though he knows he can't see them all.

"We're assessing the population we see, which may be only half the goats or bears in the area," he explains. "I'm not concerned with trying to assess that there are, say, exactly 114 goats in an area. Instead, I'm trying to determine trends. For example, if I'm seeing 100 goats one year, and then four years later on the same route I see only 70, and then four years after that maybe the number is 50, then I'm pretty sure the population is on a downward trend." (For the record, Brown's surveys show that the Cabinet Mountain's goat population has been increasing slightly over the past decade.)

Wildlife population surveys and surveys of hunter harvest are the foundation of wildlife management. The information is used by biologists to relate population trends to changes in habitat and hunting pressure. It's also gobbled up by hunters hungry to improve their success or understand past hunting successes and failures. Because it's such an important part of wildlife management, FWP's population monitoring comes under intense scrutiny by hunters. Some wonder why the department needs to know how many deer, elk, and other animals are out there. Others want biologists to make more thorough counts. And some hunters may not believe the department's population estimates, especially when those numbers don't correspond with hunters' observations afield.

"We get calls from hunters wondering why they are seeing fewer deer in their hunting area when our biologists say the population appears to be going up," says Ron Aasheim, who heads FWP's Communications and Education Division. "We can understand why that's frustrating, and we know that it's because hunters are so concerned about wildlife in this state. But it gets down to trust, and hopefully most hunters believe that we're as committed to managing Montana's wildlife as they expect us to be."

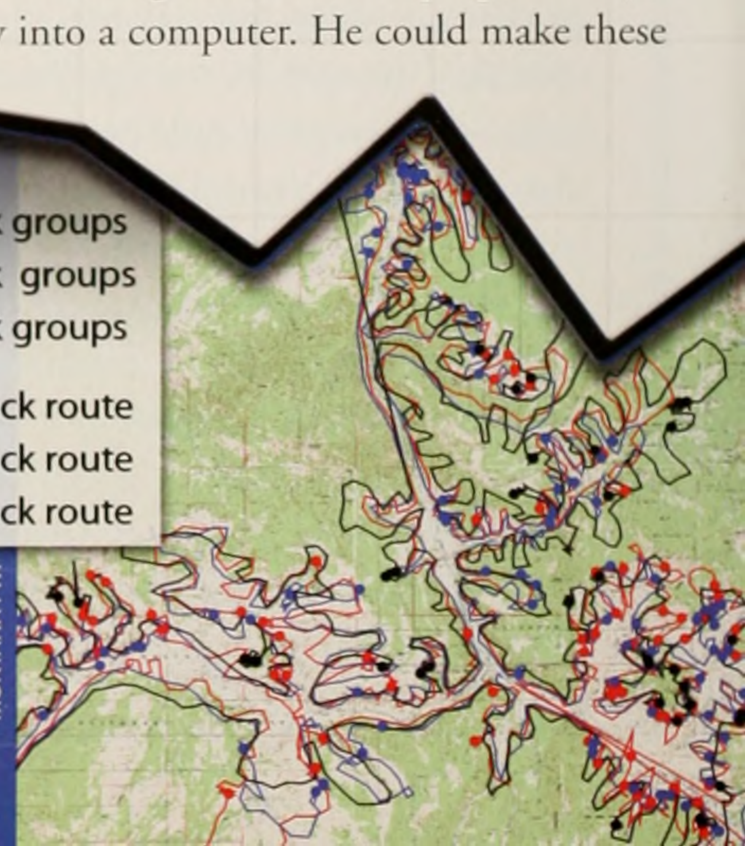
Why trends?

Back on the ground, Brown plugs the day's tally into a computer. He could make these

DANIEL BLOCK

SKY COUNTS

Most FWP surveys are conducted from the air, where biologists get a better view of the landscape and wildlife (left). The map at right shows FWP aerial track routes flown over the Gravelly Mountains for three years. Biologists fly routes where, historically, they know elk congregate in midwinter. To ensure they gather consistent data, biologists fly survey routes in the same areas each year.



MONTANA FWP

JERRY BROWN/MONTANA FWP

BRENT & DELLA LONNER

GOING TO EXTREMES To count mountain goats, some biologists strap on a backpack and head up a mountain to check remote areas that aerial surveys might miss.

calculations by hand, but the computer lets him rapidly compare past counts with information from hunter harvest questionnaires, check-station records, notes on the herd's age structure, production estimates, post-season hunter surveys, and, for deer and elk, ground counts. All are pieces of a picture.

"You never use just one thing to tell you what's going on out there," Brown says.

His goal is to arrive at a trend in the population: up, stable, or declining. FWP bases nearly all its management decisions on trends, not precise population counts.

Understandably, some hunters and landowners want hard, cold figures: Exactly how many (fill in the blank) are out there? To a man in Brown's line of work, such questions can be frustrating.

"You can't answer that," he says, "It's impossible to know exactly how many deer are living in a particular district. What we try to determine is which way the population is moving. That's what's important."

Reflecting their constituents' concerns, however, some lawmakers want more accurate information. During the 2003 session, the Montana legislature passed a bill mandating FWP to provide exact population estimates of all big game species to the best of its ability using a variety of sources. The department is meeting the new requirement by improving how it combines harvest statistics, aerial surveys, and other population estimation techniques to generate more accurate numerical estimates.

In Montana, almost every game species is surveyed, tabulated, analyzed, and cross-referenced against long-term trends (see sidebar, page 17). Biologists crunch numbers for elk, deer, pronghorn, goats, sheep, bears, and moose, along with furbearers, geese, pheasants, ducks, and sage grouse. Typically, they count wildlife in the same areas and at the same time each year. Biologists conduct most surveys from the air, but some are done by ground crews.

The pheasant crowing count is one survey that makes headlines every year. Each spring, wildlife biologists and technicians drive established routes and stop at predetermined sites. They listen for a set period of time, counting the number of roosters they hear crowing, then drive to the next stop. The crowing counts don't tell biologists exactly how many roosters are in a given area. Instead, they show upward or downward trends from year to year.

How it's done

In some cases, biologists extrapolate surveys in small areas to arrive at a fairly accurate rangewide population estimate, much the way pollsters measure public opinion by sampling a small percentage of households (called representative samples).

In the case of Montana's mule deer, biologists intensively survey 13 "census" areas scattered across a variety of habitats. Biologists then compare the highly accurate census area information to 67 "trend" areas, which are less intensively surveyed but represent a more complete picture of mule deer habitats statewide. With the census areas as their representative sample, biologists use computer models to estimate the

DEA VOGEL

LOOK AND LISTEN When counting hard-to-spot wildlife species, FWP biologists count tracks, calls, or other indicators. For example (from left to right), biologists and technicians listen for pheasant rooster crows at established listening stops, examine DNA in grizzly bear hair strands left on barbed wire surrounding lure stations, and count the tracks of mountain lions and other furbearers in snow.

MONTANA OUTDOORS

KERRY T. NICKOU

One of the biggest challenges facing FWP biologists is earning the trust of hunters whose observations differ from what surveys indicate.

population size, age, and sex composition in the trend areas. From this they get an accurate snapshot of the state's mule deer herds, as well as the information used to monitor population swings and adjust harvest goals.

Different perspectives

One of the biggest challenges facing biologists is earning the trust of hunters whose observations differ from what surveys indicate. In northwestern Montana, for instance, many hunters believe the whitetail population has not sufficiently recovered from the brutal winter of 1996–97. By tracking deer trends and age structure before and after that winter, however, biologists know the population is on the rebound.

"Right now, there are a lot of whitetails out here," says Brown.

Yet during the 2004 hunting season, hunters weren't convinced, because they saw few whitetails. Due to the lack of snow, deer didn't migrate to their usual habitats.

"The perception of many hunters was there weren't any deer left," says Brown.

That also occurred in the Missouri River Breaks while longtime FWP research biologist Ken Hamlin was doing research in the 1980s. "The peripheral habitat near roads is where population fluctuations are most extreme, not in the remote core habitats," Hamlin says. "Some years there'd be a slight overall population decline, but most of that decline was along the peripheral habitat. So we'd hear from hunters that there were 'no deer,' when in fact there were lots of deer—but they were living beyond where most people would see them."

Such differences of perspective are not unique to Montana. Last year, hunters around Rangely, Colorado, challenged the validity of the state Wildlife Division's aerial samples. The state, hunters, and several other interested parties finally agreed to a conflict resolution process, which resulted in another 35 hours of aerial surveys that largely validated the Wildlife Division's original findings—at an additional cost of thousands of dollars.

Despite the fact that hunters were involved in the design, analysis, and interpretation of the survey, many still refused to accept the department's estimates.

Public comment on population estimates vary widely. "It's interesting to me how things have changed over the years," says Hamlin. "When I first started working, we mainly heard from hunters who were accusing us of over-counting the animals," he says. "The concern was that we were allowing for too much harvest. But nowadays, it's almost just the opposite. We're hearing more from landowners, and they're saying we're not counting all the animals out there and that we should be harvesting more."

According to Hamlin, FWP has conducted many "show-me" flights, in which hunters take part in aerial surveys. "In almost every case," he says, "they saw what we saw and counted what we counted."

Hamlin says he and other biologists understand why the public's view of populations frequently differs from their own.

"In the Gravellys, for example, portions of some elk herds spend part of the year in Idaho and Yellowstone Park," Hamlin says. "When we're flying traditional winter ranges during a mild winter, we sometimes get low counts because portions of the elk populations are not even on the flight area—which we determine based on locations of radio-collared elk—and it's impossible and too expensive to fly down into Idaho and try to count them. But all that is mathematically adjusted based on our knowledge of elk distribution from year to year."

Other factors affect surveys. Too little snow makes animals hard to see. Wet and windy weather obscures wildlife from aerial spotters. Above-average rainfall disperses game animals widely across their range.

"It's not as easy to count animals as people think," Brown says.

Lines and dots

Researchers plot most FWP survey data on detailed maps. At his Bozeman office, Hamlin pulls up last January's aerial survey results on his computer monitor. Red lines trace his elk survey route up and down various drainages. The route is superimposed over blue and black lines indicating the previous years' survey routes. Red dots show where he spotted elk this past year.

"See here?" he says, tapping the screen with his finger. "We pushed up this drainage a little farther this year because we were still seeing elk tracks in the snow." A red dot higher in the drainage shows that the

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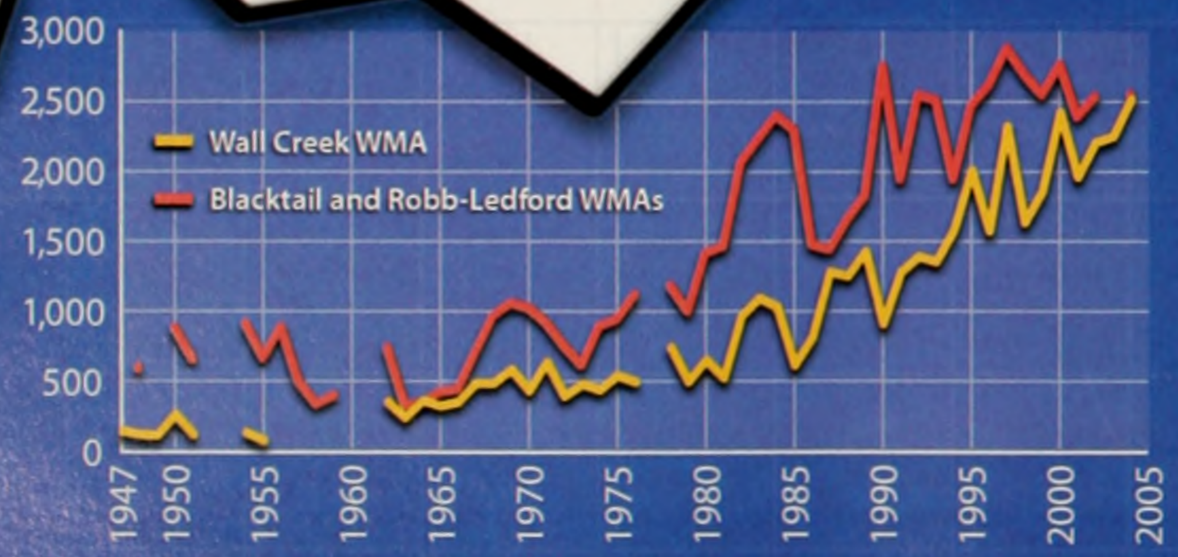

DECADES OF DATA

FWP biologists now have data on some populations going back a half-century or more. For example, this graph of elk counted in three Gravelly Range wildlife management areas shows how the population began to grow after state acquisition (1960: Wall Creek, 1972: Blacktail, 1988: Robb-Ledford). Numbers really took off beginning in the late 1970s, primarily due to tighter harvest restrictions. In recent years FWP has tried, with mixed results, to increase harvest in the area to level off the populations.

biologists found elk there.

When all the results are in, Hamlin analyzes the make-up of the herd, particularly cow:calf and bull:cow ratios. After comparing that to information from other surveys, he analyzes the ratios and numbers to determine the direction of each population.

Geese by the thousands

For at least one game species in the state, population estimates are rarely disputed. Jim Hansen is the department's migratory bird coordinator for the Central Flyway, and it's his job to keep tabs on the burgeoning Canada goose population along the Hi-Line.

Counting waterfowl is tricky—not because they're hard to spot, but because there are so many.

"When we leave from the airport, we're flying at maybe 800 to 900 feet above the ground," Hansen says. "It's low enough then that I can count the geese. But if there's a couple thousand geese in a field…well, then I'll have to take the eraser of my pencil and block them off on the window of the plane: groups of 30, 40, 60, 80, 100—until I know what a group of 100 geese looks like. When we get up to 2,500 or 3,000 geese in a group, it gets even harder, but overall I think we're pretty accurate." Goose hunters won't be surprised to hear that Hansen says eastern Montana's Canada goose population is expanding.

Ducks are another story. "There's some skepticism among hunters about the numbers for the breeding duck population," Hansen says. "We hear from hunters that they didn't see a lot of ducks this year, that our surveys must be wrong, that we fudged the numbers—that sort of thing.

"Unlike geese, ducks are not that apparent. They go to lots of different places. If hunters are in one area, and they don't see ducks over their decoys, they assume there aren't many ducks. But it doesn't mean the birds aren't somewhere else."

Wildlife surveys have always engendered a certain level of controversy. If the biologists who conduct them aren't inured to criticism, they have at least learned to accept it. The addition in 2004 of population data published on FWP's website may help. This will allow the public to monitor the rise or fall of populations themselves. But no one ever expects the controversies to die out completely.

"You hear all kinds of things," Hansen says. "And it seems we always hear from the hunters who aren't doing well." He pauses, perhaps reflecting on his own days in a duck blind. "But of course, the hunters who are doing well aren't talking."

Check out FWP's current population estimates on-line at fwp.mt.gov. Under "Hunting," go to "Plan a Hunt," and then click on the hunting district and species you're interested in.

FWP surveys and population monitoring

Wildlife biologists will tell you that surveying wildlife and monitoring populations are the most important things they do to manage Montana's wildlife. Lacking that information, says one biologist, "would be like trying to fly an airplane blindfolded." What follows are the major wildlife surveys FWP conducts each year:

Big Game

- White-tailed deer*
- Pronghorn
- Bighorn sheep*
- Moose*
- Black bears
- Mule deer*
- Elk*
- Mountain goats
- Mountain lions

Protected Species

- Grizzly bears
- Wolves

Furbearers

- Winter track surveys
- Yellowstone R. beavers
- Coyotes

Game Birds

- Sharp-tailed grouse
- Ruffed grouse
- Wild turkeys
- Sage grouse
- Blue grouse
- Pheasants

Migratory Game Birds

- Midwinter waterfowl surveys
- Spring breeding surveys
- Sandhill cranes
- Mourning doves

Nongame Birds

- Bald eagles
- Breeding birds
- Least terns
- Colonial nesting birds
- Waterbirds and wading birds
- Other raptors
- Loons
- Piping plovers

Other

- Rabbits
- Other small mammals
- Swift foxes
- Amphibians and reptiles
- Prairie dogs
- Bats

* Denotes species surveyed twice each year

"Get anything?"

Sometimes the most accurate way to monitor wild animals is to count and examine the dead ones. That's why FWP relies heavily on hunter check stations and telephone harvest surveys.

In northwestern Montana, for example, thick forest cover prevents wildlife biologists from counting white-tailed deer from the air. So instead they count harvested bucks.

"An estimate of buck numbers harvested each year largely reflects numbers of deer in the population," says research biologist Dave Pac. If the buck harvest was up 10 percent, says Pac, it's likely the pre-hunt population was up about 10 percent, too.

"Of course, all this is retrospective," he adds. "It estimates the level of the previous fall's population, but it doesn't take into account the most recent winter."

Pac adds that biologists, over a series of years, can also reconstruct deer populations by aging teeth from deer brought in by hunters at check stations: "We mainly use this information in research projects to validate estimates we arrive at by other methods."

Predator skulls also provide important information. With few other ways to gather data on black bear and mountain lion age, sex, and populations, FWP requires bear and lion hunters to provide skulls of their kill.

Another hunter survey is the federal Harvest Information Program. The survey is conducted when migratory bird hunters buy their waterfowl license.

Candy Hinz coordinates FWP's annual telephone surveys. She says the roughly 80,000 hunters called each winter as part of the survey don't seem to mind taking a few minutes to provide FWP with harvest information.

"Hunters like to talk about their hunting activity," she says. "They understand this information is essential for the department to effectively manage Montana's wildlife, and they are happy to help out."

JEFF HENRY

CHECKUP
Biologists age teeth at check stations.