Montana Fish, Wildlife & Parks
Region 2 Wildlife Quarterly

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Belted kingfisher at Council Grove State Park, September 5, 2020.

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Region 2, 3201 Spurgin Road, Missoula MT 59804, 406-542-5500

Find the Quarterly online at *fwp.mt.gov/regions/r2/WildlifeQuarterly*

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The Region 2 Wildlife Quarterly is a product of Montana Fish, Wildlife & Parks; 3201 Spurgin Road; Missoula 59804. Its intent is to provide an outlet for a depth of technical information that normally cannot be accommodated by commercial media, yet we hope to retain a readable product for a wide audience. While we strive for accuracy and integrity, this is not a peer-refereed outlet for original scientific research, and results are preliminary. October 2015 was the inaugural issue.

Winged Barnacles

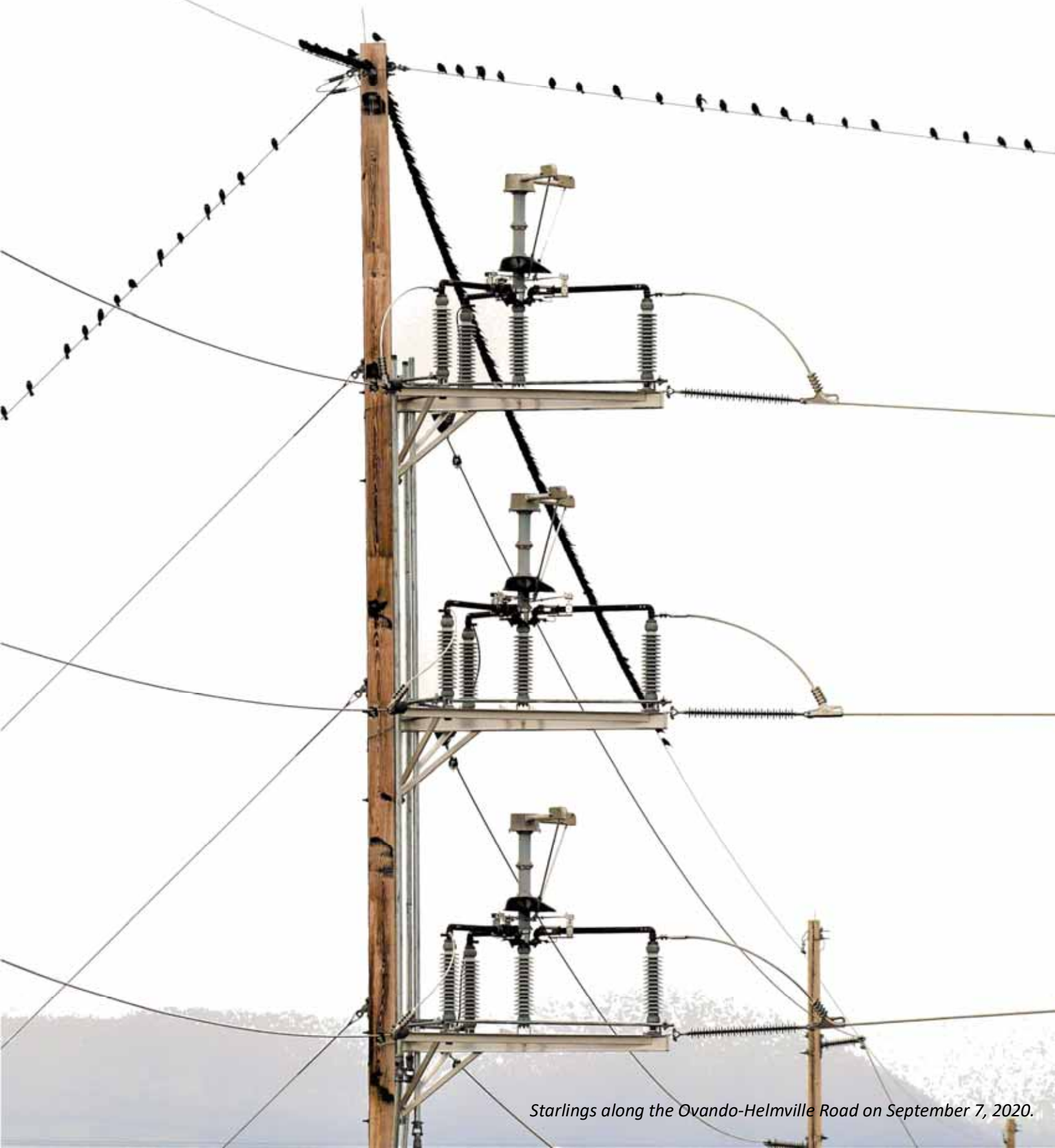
"Stop. Stop!!"

"What?"

"Look at all the birds!"

We'd photographed starlings on a wire in the past, though I was pleased with her sustained enthusiasm. So, I stopped the truck. The more she spoke, the more I began to doubt that I was seeing what she saw. So, I cranked up the zoom to 500mm. (See the close-up on the previous page.)

"I thought they were insulation on a hot wire!" I explained.



Starlings along the Ovando-Helmville Road on September 7, 2020.

Clark’s Nutcracker

It’s apparently been a banner year for seed production in western Montana’s ponderosa pines, if a Clark’s Nutcracker is a reliable bellwether.

Clark's Nutcracker may be found where its food is, which varies from year to year because conifer seed crops are boom or bust affairs. Ponderosa pines do not produce seed crops every year; therefore, Clark's Nutcracker is often not found gathering seeds at lower elevations where ponderosa pine grows. This fall seems to be one of the good years, with Clark's Nutcrackers making hay in a Blue Moon.

It's called "masting," when the pines produce seeds in such abundance as to overwhelm seed predators. On the Blue Mountain Recreation Area this fall, there were enough seeds to mishandle and waste one now and then (pictured here).

Caching

Above: "Could of swore I cached my seeds by a Red-breasted Nuthatch." .Clark's Nutcracker is pictured in the background, behind the nuthatch. Below: Burying pine seeds for later use?

We can't say it better than Marks et al. (2016. Birds of Montana. Buteo Books, Arlington VA, page 375):

> *Perhaps no other bird has altered Montana's landscape to the extent that the Clark's Nutcracker has. Each year, nutcrackers harvest vast quantities of pine seeds, haul them off and bury them for later consumption, and effectively disperse them when the "planted" seeds they do not retrieve sprout and grow into mature individuals.*

What labor it must require to carry and bury each seed, one by one. So, evolution provided an adaptation. Again, from Marks et al. (2016):

> *Nutcrackers harvest pine seeds in late summer and autumn, carrying as many as 150 seeds at a time in a special pouch beneath their tongue and burying them up to 12 km* (7.5 miles) *from the source tree. An individual nutcracker may harvest and store more than 30,000 seeds in a three-month period, the seed caches sustaining the adults and young for the rest of the year (Tomback 1978, Lanner 1996).*

Can't find your car keys? Nutcrackers have such incredible spatial memory that they can find their caches for up to 9 months from miles away. This allows them to nest at high elevations in early spring while the snow's still on, and deliver seeds to their young from seed caches on lower, sun-warmed slopes.

Pioneer Ornithology

NESTING HABITS AND SOME
GENERAL NOTES ON
CLARK'S NUTCRACKER
(Nucifraga Columbiana WILSON)

by

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Presented in partial fulfillment of requirements for the degree of Master of Arts in Zoology.

Montana State University 1948

Approved:

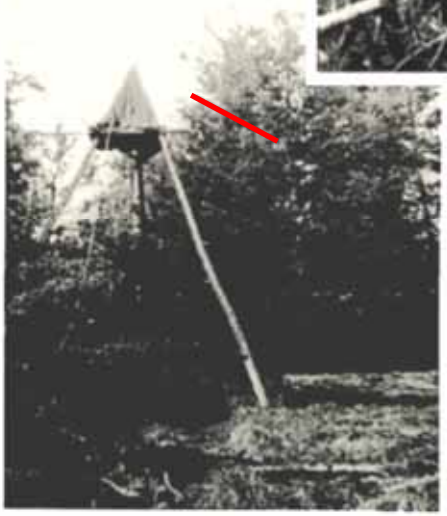
Chairman of Examining Committee

Dean of the Graduate School

From Mewaldt (1948):

In western Montana, I have found Clark's Nutcracker distribution apparently closely related to the occurrence of the Ponderosa pine (Pinus ponderosa), the White-Bark Pine (Pinus albicaulis). and the Douglas Fir (Pseudotsuga taxifolia). Saunders (1921) writes: "since white-bark pine is a Hudsonian zone tree, yellow pine [Pinus ponderosa] a Transition species, and limber pine ranging from Hudsonian down through Canadian and into Transition, the abundance of Nutcrackers at various elevations in fall and winter, varies with the abundance of the seeds of these various species."

Probably the moat important species of tree in the ecology of Clark's Nutcracker in western Montana, is the Ponderosa Pine. These trees not only provide nest sites, but also produce seeds large enough to be of some importance in the diet of the nutcracker. Forest Service Experiment Station tests show Ponderosa Pine seeds from Idaho and western Montana forests average about 10,000 to the pound (Cunningham et. al., 1926). The White-Bark Pine, found only at higher elevations is also important as a producer of seeds readily taken by nutcrackers.



Clockwise: Leonard Richard Mewaldt; Female Clark's Nutcracker incubating; Clark Fork River from the site of Nest 1 on Mitouer Ridge, March 11, 1947; The blind at Nest 1 on Mitouer Ridge on March 11, 1947, and a red arrow indicating the position of the nest.

Energy Break

Above: Red squirrel along Rock Creek in November 2020.
Right: White-breasted Nuthatch at Council Grove State Park in November 2020.

Like Clark's Nutcracker, the native red squirrel stores seeds for the winter. This specimen doesn't seem to have the hang of caching yet, and one can only hope that eating the seeds *before* storing the cones doesn't catch up to him in the dead of winter.

In this case, the delicacy is Douglas-fir. It's interesting in part because Mewaldt (1948) reported that Douglas-fir seeds are very small—about 44,000 to the pound, compared with 10,000 to the pound for ponderosa pine. While it may not be efficient for a Clark's Nutcracker to extract and transport individual seeds of small size, it might not matter as much to a squirrel that will carry and cache the whole cone with its nutty contents.

While the White-breasted Nuthatch gleans insects in the summer, its diet shifts to a predominance of seeds in fall and winter. Like nutcrackers and squirrels, White-breasted Nuthatches store seeds for the winter, but unlike those species, they stuff the seeds into crevices in bark for later rediscovery.

Climate and Mast

Entrance to Lubrecht Experimental Forest along Highway 200.

Mast in the form of pine seeds and the like is a hot commodity, and quite important to the variety of wildlife that make a living from it.

Seed specialists, like Clark's Nutcracker, can better adapt to the ups and downs of native mast crops, given wings to fly miles between famine and feast, whereas the short legs of the yellow-pine chipmunk require an expanded palate and diet within a much smaller home range, which may opportunistically include pine nuts among other items.

The Lubrecht Experimental Forest is located atop Greenough Hill, along Highway 200 between Potomac and the Paws Up Ranch. Viable seeds from ponderosa pines, collected on the Lubrecht Forest from 1985-1994, were subsequently analyzed by Keyes and Manso Gonzales and their results published in 2015.

Their research inquired as to why ponderosa pines produce viable seeds in some years and not in others. Surely, nutcrackers and chipmunks have wondered as well.

The researchers questioned whether ponderosa pine seed production was predictably cyclical, like snowshoe hare cycles in the far north, but their research indicated that it was not. Alternatively, they wondered if forest management practices explained the patterns of seed production that they observed, but their research indicated no. They wondered if mast depletion by nutcrackers, chipmunks and other agents of seed removal could explain the wide annual disparity in realized seed crops, but the data indicated not so much.

Instead, Keyes and Manso Gonzales (2015) found a relationship between climate and the production of viable ponderosa pine seeds. Ideal average temperatures in early spring in the first year (52 degrees F) and second year (48 degrees F) of cone maturation, coupled with precipitation, make good seed crops in ponderosa pine. Late frosts are negative events for seed production.

It rained ponderosa pine at the rate of over 200,000 viable seeds per acre in 1985, while no viable seeds were produced in 1986 or 1987 and other years produced intermediate crops.

Yellow-pine chipmunks along Rock Creek Road in 2020.

As the climate continues changing, we can expect to see food generalists and mast specialists affected, one way or the other, along with the forests themselves. The expression of climate on temperature, precipitation and frost will vary from year to year with elevation, aspect and weather patterns. Maybe the question is not so much whether nutcrackers or chipmunks will do well in a certain place, but rather where ponderosa pine will and won't reproduce in the future.

Research Citation:

Keyes, C.R., Manso González, R. (2015). Climate-influenced ponderosa pine (Pinus ponderosa) seed masting trends in western Montana, USA. Forest Systems, Volume 24, Issue 1, e-021, 7 pages. http://dx.doi.org/10.5424/fs/2015241-05606.

Quality Time

Above and below: A 7-year-old ram with a 5 or 6-month-old lamb in lower Rock Creek on November 3, 2020.

Talking Trash

The interplay of bighorn rams, ewes, rut and the onset of winter in lower Rock Creek is intricate and fascinating to watch.

Bighorn ewes and their relatively few lambs are visible and highly watchable along and upon the first 8 or so miles of Rock Creek Road (exit I-90 25 miles east of Missoula) in the late-spring, summer and early fall. During those months, mature rams are almost always absent in that area.

Mature rams appear with the ewes in late October or early November, as if by magic.

Here's where luck comes into play.

As long as November stays mild or dry, and the ground stays bare of snow, a ringside seat to one of the most spectacular wildlife displays in the West can be had from the comfort of your heated vehicle.

However, if and when the snow flies, the sheep move to the upper slopes of Babcock Mountain, where a long lens or spotting scope are required for quality viewing of the rutting ritual.

Serious sheep watchers check often, for their quarry are fickle, and a day's time is all it takes for roadside viewing to magically appear, or end abruptly.

We viewed the sheep on November 1 and counted 54 in a bunch, including rams, close to our truck. On November 3, a couple more rams had joined the group. On neither occasion had the rams ramped up to the point of classic head-butting.

More to come . . .

Above and below: Bighorn sheep in lower Rock Creek, near Sawmill fishing access, on Election Day, 2020.

Beaver Tail Trail

Above and below: A beaver circling and slapping its tail in the Clark Fork River at Tower Street Conservation Area, which is managed by the City of Missoula, on October 4, 2020.

Many of us have been startled by the loud slap of a beaver's fat, flat tail on the water, but not as many have had the opportunity to examine the visual technique of a slapping beaver, frame by frame.

Why does the beaver slap its tail? Prevailing wisdom is that the slapping beaver is warning other beavers of danger. As the photographer being slapped, so to speak, it has seemed to me, on a few occasions, that a beaver slapping the water may be testing the intruder—i.e., me—as to the risk being posed. On those occasions, the beaver would slap, dive, and within a minute or two reappear, sometimes swimming slightly closer to me than before, seemingly out of curiosity. Objective naturalists would probably agree that the beaver slaps for a variety of reasons.

Beaver Tail Trail's End

This particular beaver swam back and forth in front of me, slapping and reappearing on four separate instances.

Beginning at the top of page 12, and ending on this page, is a sequence of 5 images depicting the stages of a single slap-and-dive.

The first picture (page 12) is taken before the beaver slapped its tail. The second picture shows its position while raising the tail to slap the water. In that picture we can see the tail rising out of the water and the water running off it just before the slap.

The third picture (page 12) appears to capture a dive, which typically accompanies a beaver slapping its tail. The beaver's head is entering the water on the right-hand side of the picture.

As I view the fourth picture in the sequence, which is at the top of this page (page 13), I see hind feet coming up high out of the water, with the tail visible off to the left of the feet. My question to the reader is: where is the beaver's head now? It looks to me as though the rodent has spun and turned, like an athlete turning in her lane during a swim meet.

Perhaps the fifth picture in the sequence, in the middle of this page, confirms that assessment, as we see the tail coming straight out of the water with the hind feet kicking to the right of the picture.

Beaver Tail Reflections

After several long seconds of searching the water's surface after the dive, I spied the beaver's head emerge from underwater. After each of the four slaps and dives that I photographed, the beaver was heading in the opposite direction from its heading before each dive. Call me dull, but I hadn't expected that. Maybe predators of the beaver, such as coyotes, wolves, mountain lions and eagles don't expect that either.

Above: The Tower Street beaver reverses its heading when resurfacing from a tail slap and dive. Below: A beaver is visible underwater as it dives in shallow water on the Blackfoot-Clearwater Wildlife Management Area in 2020.

Muskrat Tale

Yet another aquatic mammal is the muskrat, seen here swimming under the bridge over Rock Creek to Valley of the Moon on November 3. Like beavers, muskrats build lodges in marsh environments, like this one (below) in the Nevada Valley, south of Ovando, which attract Mallards and Northern Harriers for perches.

Worth a Thousand Words?

. . We suppose that depends on the reader.

On October 10, we trailed this Black-capped Chickadee with our camera lens to a tent constructed by tent caterpillars, back in the spring. Surely, something of ecological significance would occur.

The setting at large is shown in the photo at right, but we seek a closer view to dissect the situation (below).

The caterpillars and subsequent moths were long gone by October. We assume that the black dots in the tent represent an accumulation of caterpillar feces.

However, that's nothing fecal in the chickadee's mouth; at least it doesn't appear so. It looks more like a seed and we think it is a seed that the bird brought with it, rather than one extracted from the tent.

Chickadees do consume tent caterpillars in the spring and we've read accounts where chickadees have been noticed visiting tents out of season. This individual behaved like a visitor and only remained for several seconds, which is quite a stay in one place for a chickadee.

Black-capped Chickadees do store food for the winter, but it wouldn't seem wise to invest in such a relatively flimsy structure to weather heavy snow and strong winds. They also tend to take a bite and fly off elsewhere to eat it, so maybe the tent was simply on the way.

By the Way . . .

It might be material to know that this shot (at right) was taken just a few seconds before the one on the previous page. By cropping the image more closely than artistically advisable for scientific purposes, we can see that the bird appears to be probing or gleaning the surface of the tent constructed by tent caterpillars.

Was the "seed" in its beak, which was visible after this moment at right, harvested from the tent after all? Was it actually a seed? And, does it look like there might be objects in the tent, alongside the feces, that resemble the one in its beak?

Perhaps the fact that the chickadee spent a quite short time at the tent during this event is misleading. Because if chickadees are known to gather their food in one spot and travel to another spot to eat it in peace, then maybe the bird gathered the food item at the tent and simply flew off to eat it.

While a scientific breakthrough eludes us, the experience sent us to books and articles online, where we learned that others have seen chickadees on caterpillar tents in fall, but without explanation.

Look closely at the chickadees in the center and bottom of this page and you'll see that the black cap has a white eyebrow. That makes them Mountain Chickadees, which are also common, but we don't notice as many Mountain Chickadees as Black-capped in our travels.

Mountain Chickadees and Black-capped Chickadees often travel in mixed flocks, as did these chickadees of each species at Tower Street Conservation Area in Missoula this fall.

Both species are yearlong residents in Montana and will be here this winter for us to enjoy, and for them to find the foods they've cached over the summer and fall.

Predators

Above: A Black-capped chickadee using a handy wire for anchoring a knapweed seed head while possibly dissecting and extracting gall fly larvae for lunch. Below: A chipmunk foraging on knapweed seeds—or maybe gall fly larvae (?).

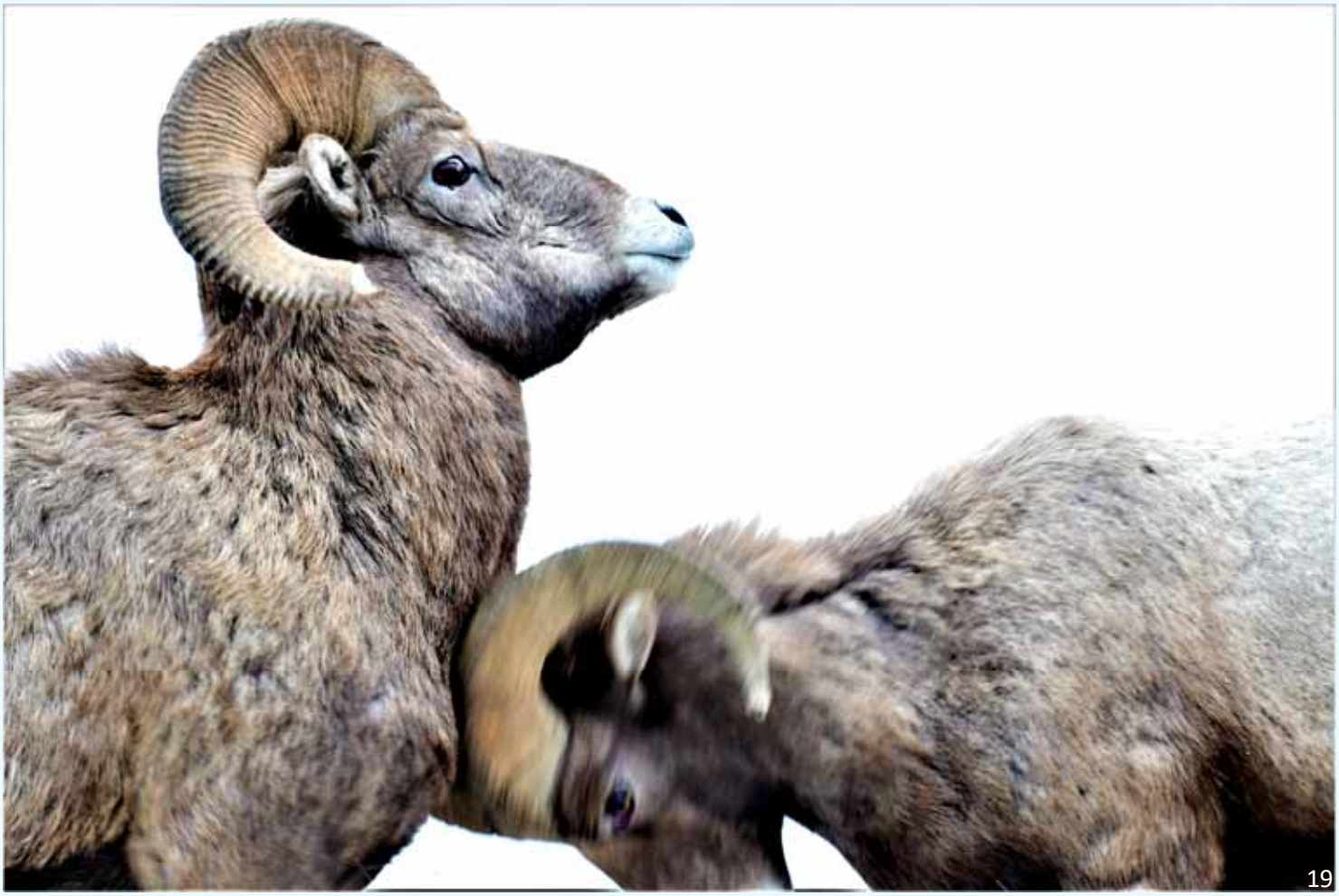
Seldom do we think of the chickadee as a predator, but it's only a matter of perspective. Chickadees are called predators by entomologists who are interested in producing gall fly larvae in the seed heads of spotted knapweed. Chickadees prey on the larvae.

The objective of introducing gall flies to knapweed is to reduce seed production and to stress invasive knapweed communities.

However, the introduction of gall flies produced a documented boon in the diets of deer mice and chickadees. We've seen reference to chipmunks eating knapweed seeds, but do they eat gall fly larvae as well?

Bighorn Serengeti

Above and below: Bighorn sheep around Bunch Gulch, up the East Fork of the Bitterroot River, on November 14, 2020.



Full Curl

A dream of hunters, photographers and wildlife watchers alike is a ram like this one (above and at right), seen up Petty Creek on November 15, 2020.

The rams photographed up the East Fork of the Bitterroot on the day before, and displayed on pages 19 and 20, were 4-year-olds. They were pretty rams and quite entertaining, but had some growing left to do.

This larger, Petty Creek ram kept its age a secret, no matter how many different images we've magnified and inspected for growth rings. The best guess we can make is 7 years old—a mature ram—but that's a surprising amount of annual horn growth for a ram of that age. We wonder what we'd conclude about its age if we had the horns in our hands. (The view at right offers faint support for more rings than that.)

Odds are that this ram will get at least one more year's growth. On the way up the creek, we passed by the last of four either-sex license-holders in Hunting District 203 to fill their tag, with a ram lying in the back of a pickup. No need to worry that they could've done better. The record shows they harvested an 8-year-old ram with a better than 16-inch circumference around the base of each horn.

Coequals

But, wait. The better scoring ram, by Boone and Crockett measurements, may have stepped out below the ram we just finished admiring on the previous page.

With the wider sweep of its horns, the lower of the two rams may have the greater length to go with those heavy-looking bases. Its age is even harder for us to guess from the pictures we took, but the evidence at hand argues for an older ram than the first one.

We watched these rams, along with a collection of ewes, lambs and younger rams, for quite a while on November 15. Though the rut, defined as the period between the first and last breeding events, surely was imminent, behavior in this group and in other sheep we observed on November 14-15 indicated that the rut had not quite begun. A study in Alberta reported that the rut began on November 19-25 over a three year period, and ended 20 days later with the last breeding event.

By all appearances, it was the calm before the storm, as it were, with lots of feeding and resting in close quarters, interrupted occasionally by pre-rut behavior (next page).

Feeding Frenzy

The most striking behavior among the dozens of bighorn sheep that we watched in the East Fork of the Bitterroot (above), in Petty Creek in mid-November, and in lower Rock Creek on Veteran's Day was an apparent fever of feeding among all sex and age classes of animals.

Feeding makes a lot of sense when one considers the ominous approach of winter and the leaching of nutrients from dried grasses with each passing day.

But, what about the rut? Isn't it true that rutting elk, deer and sheep lose considerable weight and body condition during the breeding season, and don't bulls, bucks and rams trade energy intake for energy expenditures required to reproduce? Haven't we all heard the stories (and passed them on) about males depleted by the rut and entering winter in poor physical condition?

The rams we've been watching this November did not get the memo. They've been feeding, and feeding hard, as if they were ewes.

A hard look at the literature offers some clues to what we've been observing. It matters that the rut is not quite upon us. Close, but not quite. A study by Fanie Pellatier (2004) in Sheep River Provincial Park, Alberta, focused on weight loss attributed to the rutting behavior of bighorn rams. She found that males aged 2 years old or older foraged more in the pre-rut than in the rut. She noted that there is a period in mid-November when rams join ewe groups and begin exhibiting some rutting activity, prior to the rut onset.

We might speculate that this also marks a brief period of transition, when rams gorge on grass for a few days in anticipation of winter and in preparation for the rut. Perhaps it's similar to carb loading for marathoners!

Pelletier ingeniously weighed rams by setting up a platform scale in sheep habitat and baiting it with salt. Individuals would periodically lick the salt and have their weights taken throughout the study, allowing Pelletier to document weight loss as the rut progressed.

In her own words: *Rams lost from 5% to 16% of their pre-rut mass over 15–20 days of rutting.*

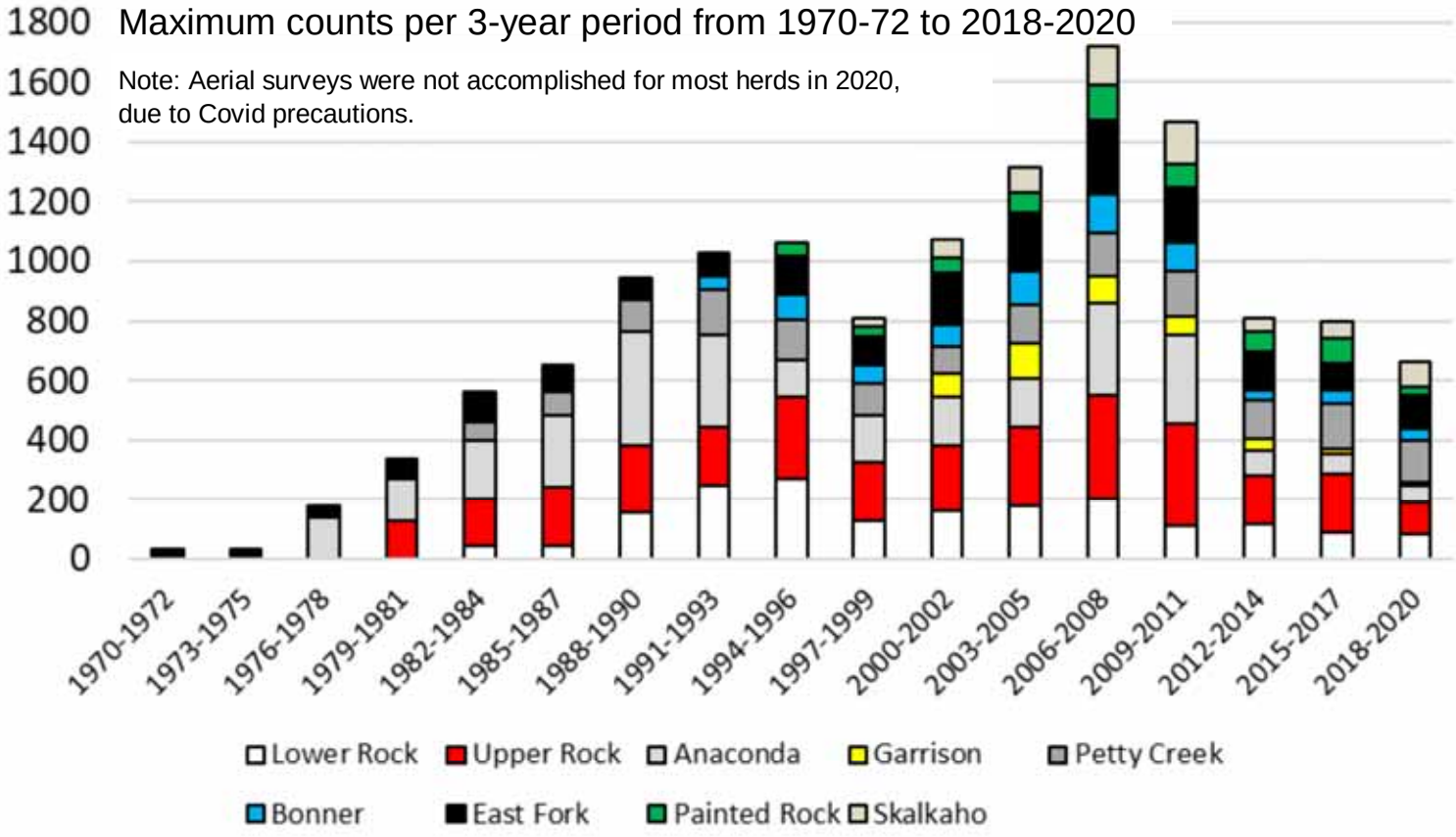
Interestingly, she found that rams entering the rut with the greatest body mass also lost the most mass during the rut. She suggested that these more physiologically fit rams may have been better able to expend more energy rutting than rams with lower body mass. She citied literature suggesting that males with low body mass might even let the rut pass without participating.

Dominant

Make no mistake: This was the dominant ram in lower Rock Creek, Hunting District 210, when this photo was taken on Veteran's Day. We saw him on Election Day as well (page 10). As is often the case in lower Rock Creek, a late-arriving rival may yet thicken the plot before the rut concludes.

Bighorn Sheep Trend

Numbers in Region 2 were halved by pneumonia die-offs in 2009-10. Recovery has been slow-to-nil in most herds. Petty Creek escaped the die-off and remained steady, while the East Fork and Skalkaho rebounded.



It’s On

Above and below: Rutting behavior observed on November 21 in lower Rock Creek.

Above: A coursing attempt on an estrous ewe, blocked (below) by a competing ram on November 21 in lower Rock Creek.

Petty Creek, November 15, 2020.

Lower Rock Creek, November 11, 2020.

East Fork Bitterroot River, November 14, 2020.

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