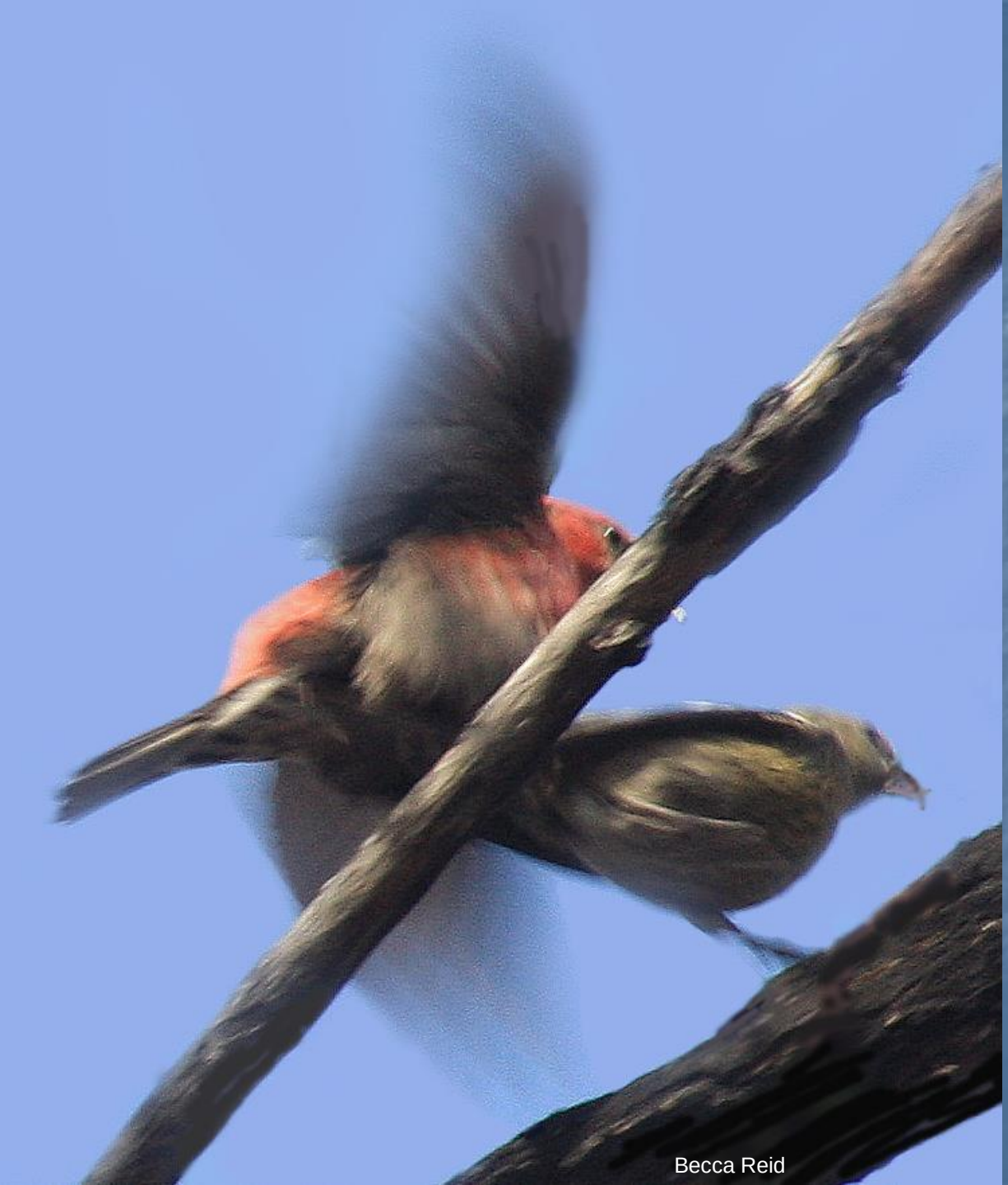
WHAT BIRDS EAT

Presented to
CHEYENNE, WYOMING AUDUBON
18 APRIL 2023
Dave Leatherman


“EVERYTHING A
BIRD DOES IS
MOSTLY FOR ONE
OF TWO REASONS…



Becca Reid

S E X

FOOD

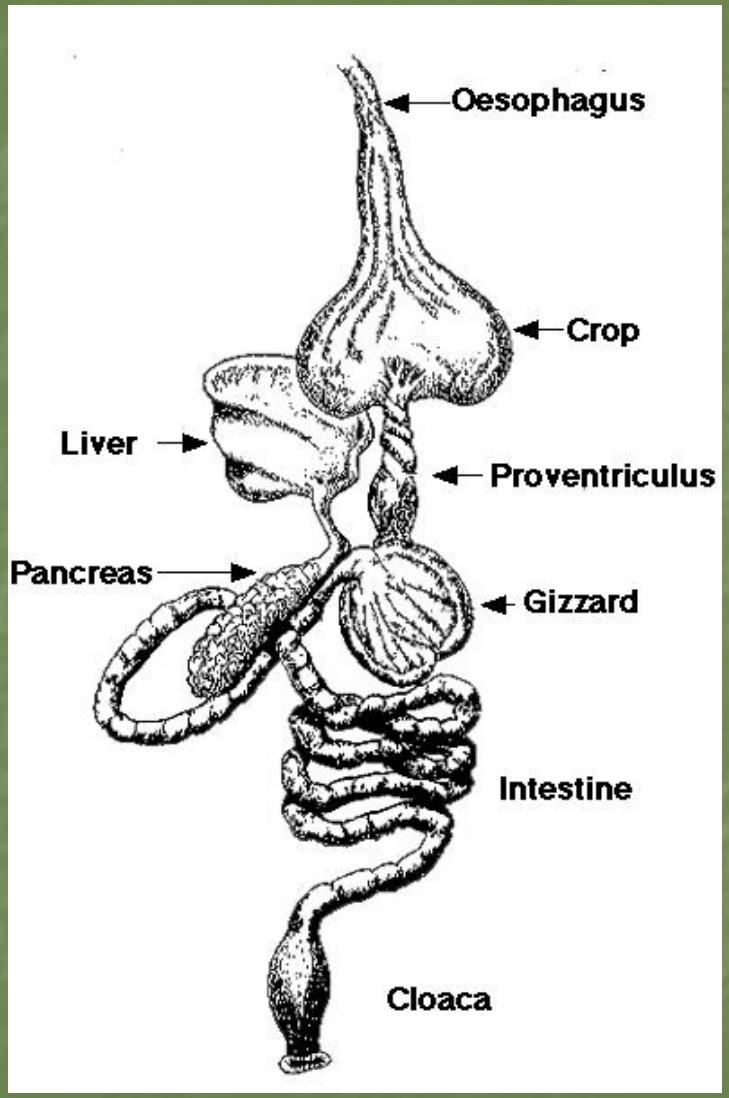
SORRY, BUT THIS TALK IS ABOUT FOOD

THE BASICS

- To survive long enough to reproduce, birds require 3 things:
  - Food
  - Water
  - Shelter (including nesting cover)

Very little is known about the specific diets of many bird species, particularly here in the Rocky Mountain West. We have the knowledge, skill and affordable photography equipment to change that.

THE BIRD DIGESTIVE SYSTEM



- **CROP** is multifunctional: temporary storage, "milk", sound, early digestion
- **PROVENTRICULUS** = "glandular" stomach
- The **GIZZARD** = "molars" or "muscular" stomach (grit)
- "**CHYME**": name for partly-digested food passed from stomach into intestine
- Rest of GI tract is digestion, absorption and elimination

DIAGRAM BY E KENTUCKY U

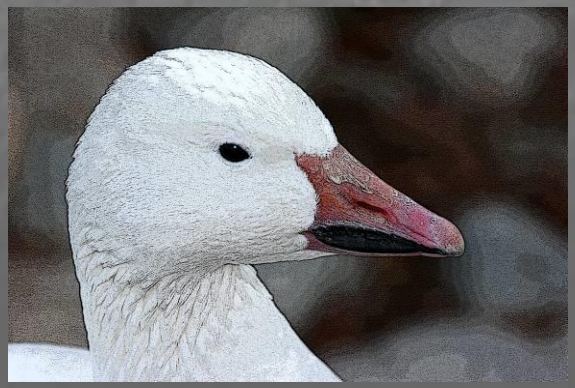
CALORIES/DAY

RESIDENT SPECIES VS. MIGRATORY SPECIES

- The main food of our **summer birds** is insects.
- **Resident birds** (here all year) often have broader diets that feature insects in summer, seeds/vegetable matter in winter
- Most migrant species migrate because they need insects which are hard to acquire in winter (NOT because they can't handle cold).

BILLS, BILLS, AND MORE BILLS

A bird's bill (beak) tells you a lot about what they eat



TREES ALL CO-WYO BIRDERS SHOULD KNOW

- Ponderosa pine
- Colorado blue spruce
- Juniper
- Douglas-fir
- Pinyon pine
- Scots pine
- Engelmann spruce
- True firs
- Aspen
- Northern hackberry
- Plains cottonwood
- Elms (Am. & Siberian)
- Russian-olive
- Gambel oak
- Honeylocust
- Green ash

BERRIES, FRUITS

- Crabapple
- Cotoneaster
- Juniper
- Mountain-ash →
- Hawthorn
- Rose
- Russian-olive
- Buckthorn
- Honeysuckle
- Currants

“BERRY BIRDS”

THE JUNIPER BERRY: "RED BULL" FOR THE PLUCKING

- Lipids (15.9% - "fat" for slow energy)
- Carbohydrates (45.8% - "sugar" for quick energy)
- Protein (3.3% - needed for many functions)
- Non-utilizable fiber ("bombs away")
- Really are cones
- Low in moisture (42.1%)
- Worth fighting over
- 0.32-0.85 kcal/berry

BOHEMIAN WAXWING

- Winter of 2022-2023 was a big invasion year
- Great, great majority of reports involved juniper, Russian-olive, buckthorn & crabapple

EXOTIC PLANTS

MAY BE HEAVILY UTILIZED BY BIRDS BUT THAT'S NOT ALWAYS GOOD

- Many exotics planted "for the birds" are actually low quality
- In general, non-native plants are:
  - Lower in fat
  - Their fruit persistence may accrue from harmful compounds
  - They require longer feedings, which increases vulnerability to predators
- PLANT NATIVES WHEN POSSIBLE AND/OR PROMOTE "GOOD" EXOTICS

CEDAR WAXWING WITH FRUIT OF COMMON BUCKTHORN

WHAT, WHEN, WHERE?

PROTHONOTARY WARBLER WITH BUCKTHORN BERRY
DENVER, LATE NOVEMBER 2013!

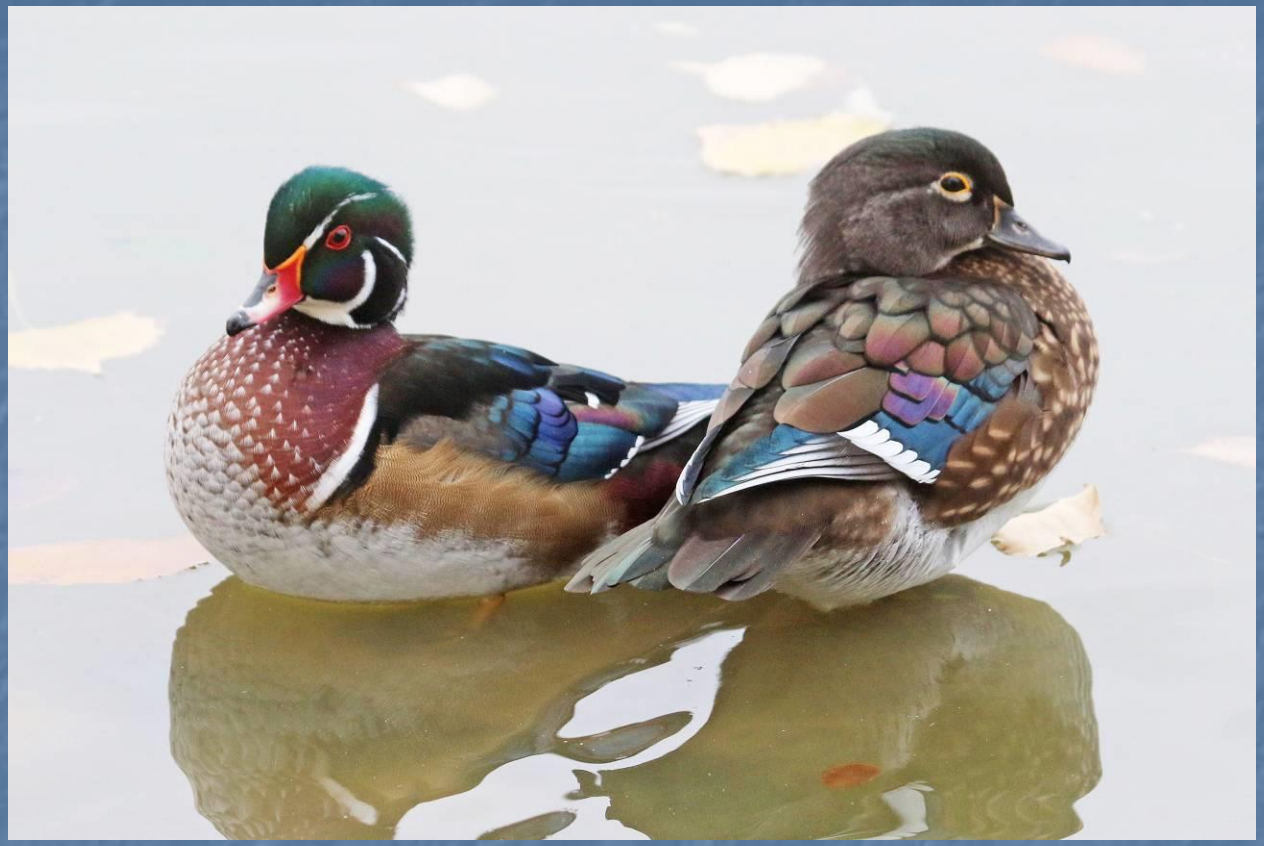
RUSSIAN-OLIVE
(the "best" bird tree?)

Ecologically NOT the best because it outcompetes willows and cottonwoods in riparian areas, but…

Fruits are a major draw for birds and this tree should always be checked.

NORTHERN CARDINAL WITH RUSSIAN-OLIVE IN LAMAR, CO

RUSSIAN-OLIVE DUCK



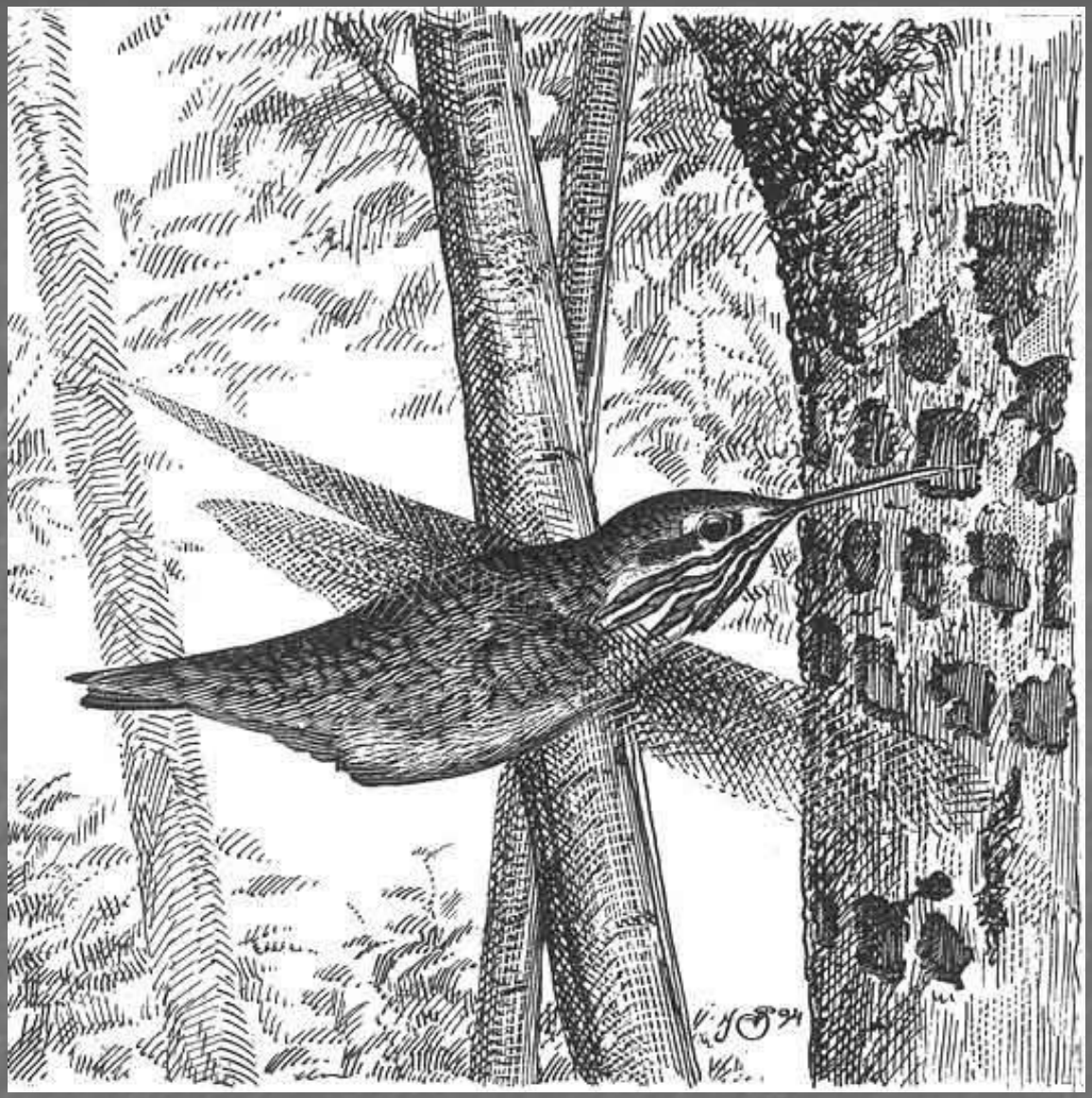
- Wood Ducks love to eat Russian-olives but probably do not contribute much to their spread (their gizzard grinds the seeds?)
- Look for Wood Ducks under Russian-olives lining the shore of small ponds, especially in fall and winter

SAPSUCKERS

- 3 species
- 2 are breeders*
- 1 rare in winter
- Make "sap wells" for the purpose of drinking sap
- Also eat items trapped in sap

* (also rarely winter)

Red-naped Sapsucker (adult male)



Calliope Hummingbird visiting sapsucker sap wells by J. Schmitt
(from Cornell's "Birds of North America" database)

HOW SAPSUCKERS TURN THE FAUCET BACK ON (SAP WELL ENLARGEMENT)

- A sap well begins as a simple peck mark
- When flow clogs & diminishes, the bird reworks the top edge
- Multi-month use of the same sap wells converts them from small pecks to large rectangles (breeding Red-naped and Williamson's, wintering Yellow-bellied)

YOUNG YB SAPSUCKER JUST GETTING STARTED

Austrian Pine
Willow Creek Park,
Lamar, CO.,
early January 2015

EXAMPLES OF SAP WELL ENLARGEMENT

CONIFER SEEDS

Clark's Nutcracker with ponderosa pine seed

Mountain Chickadee

Red Crossbill

Common Redpoll

CROSSBILLS

- Main foods in southern Rockies are ponderosa pine, lodgepole pine, spruce, Douglas-fir and spruce seeds extracted from cones by unique bill configuration.
- Eat about 3000 seeds/day
- Consume lots of H_2O
- Round out their diet with an assortment of other foods

CROSSBILLS & WATER

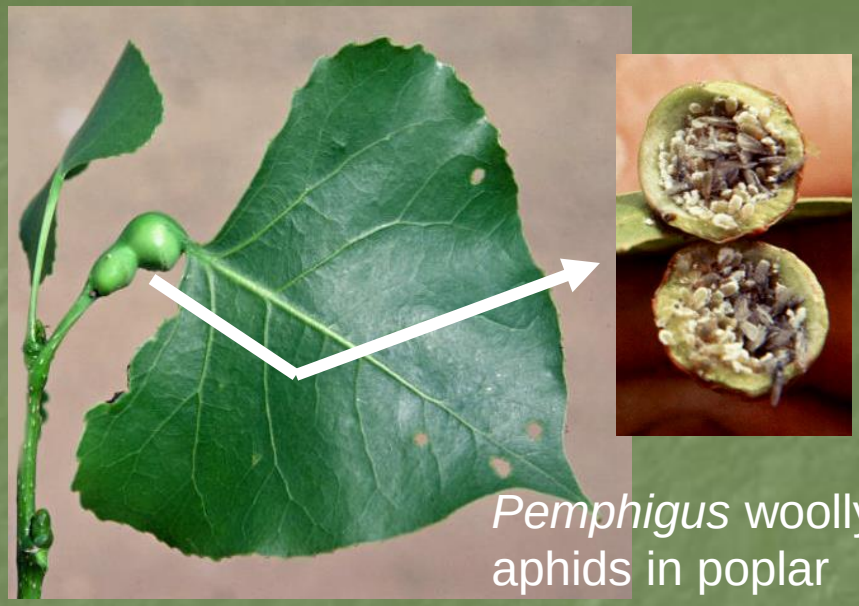
Proof they know their own faces?

To equal their consumption rate (over 20% of body mass!), I would have to drink 6 gallons of water/day

4 gallons/day is lethal to humans

In other words, a crossbill could drink me under the table (or ground)

OTHER CROSSBILL FOODS



Pemphigus woolly aphids in poplar petiole-galls

Alder seeds from catkins

European Elm Scale Insects

Larvae in leafrolls

WESTERN SPRUCE BUDWORM

- Major defoliator of western conifers, particularly Douglas-fir and Engelmann Spruce
- Budworm outbreaks are decades apart, last for several years each
- Many forest birds eat budworms, esp. Evening Grosbeak, Mt. Chickadee, finches.

From upper left, clockwise:
egg mass, larva, pupa, and adult moth

PONDWEEDS
(*Potamogeton* and *Stuckenia* spp.)

- Between the two genera, 15 spp. in CO-WY.
- Many are heavily used by diving & dabbling ducks, swans, geese, coot, and certain shorebirds
- Stems/leaves, tubers & seeds eaten
- May harbor small crustaceans called amphipods or "scuds" (*Hyalella*), which are also eaten.

PLANT NECTAR

- Sugar-laden (maybe fortified with mites, too)
- Accessing flower nectar requires a special bill and flight skills (hummingbirds)

GREEN ASH SEEDS

- Only produced by female trees
- Bumper crops in summer of 2022 responsible for lowland invasion last winter of Cassin's finch and evening grosbeaks

KEY INSECT GROUPS

- Caterpillars of moths (more so than butterflies, mostly, simply, due to quantity)
- Aphids
- Scales
- Orthopterans ('hoppers & crickets)
- Flies (especially midges)
- Odonates (dragonflies & damselflies)
- Beetles (especially leaf, darkling, ground, bark, and wood-boring)
- Gall-formers (from many taxonomic groups)
- Hymenopterans (bees and wasps, esp. flying ants)

WHITE-LINED SPHINX MOTH

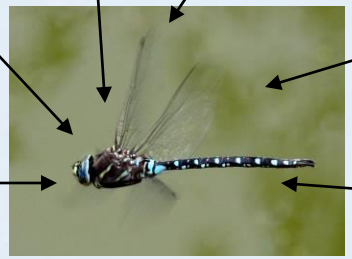
SAY’S PHOEBE BY JANE STULP SOUTH OF LAMAR

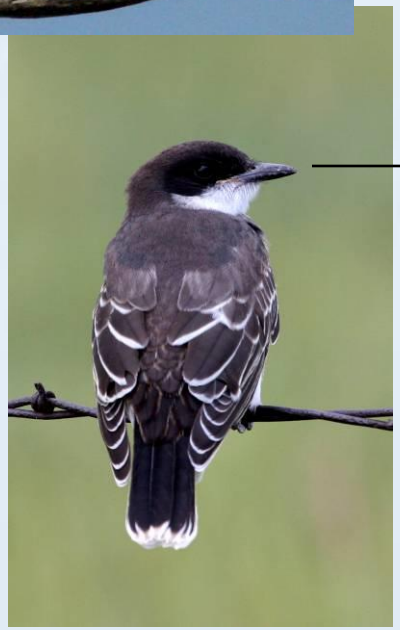
THICK-BILLED LONGSPUR N OF FC

HOUSE SPARROW IN WALSH

ODONATA
(DRAGONFLIES & DAMSELFLIES)

MAJOR BIRD CONSUMERS OF ODONATA

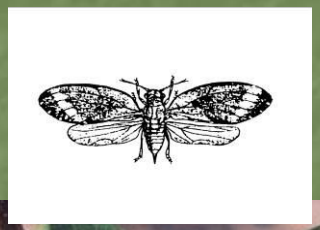




“Ever feel like something is looking at you?”

GALLS
(TO A BIRD, "PLANT PIÑATAS")

PSYLLIDS ON HACKBERRY



psyllid galls

TWO COMMON TYPES OF PSYLLID GALLS ON HACKBERRY

NIPPLEGALLS
(made by *Pachypsylla celtidismamma*)

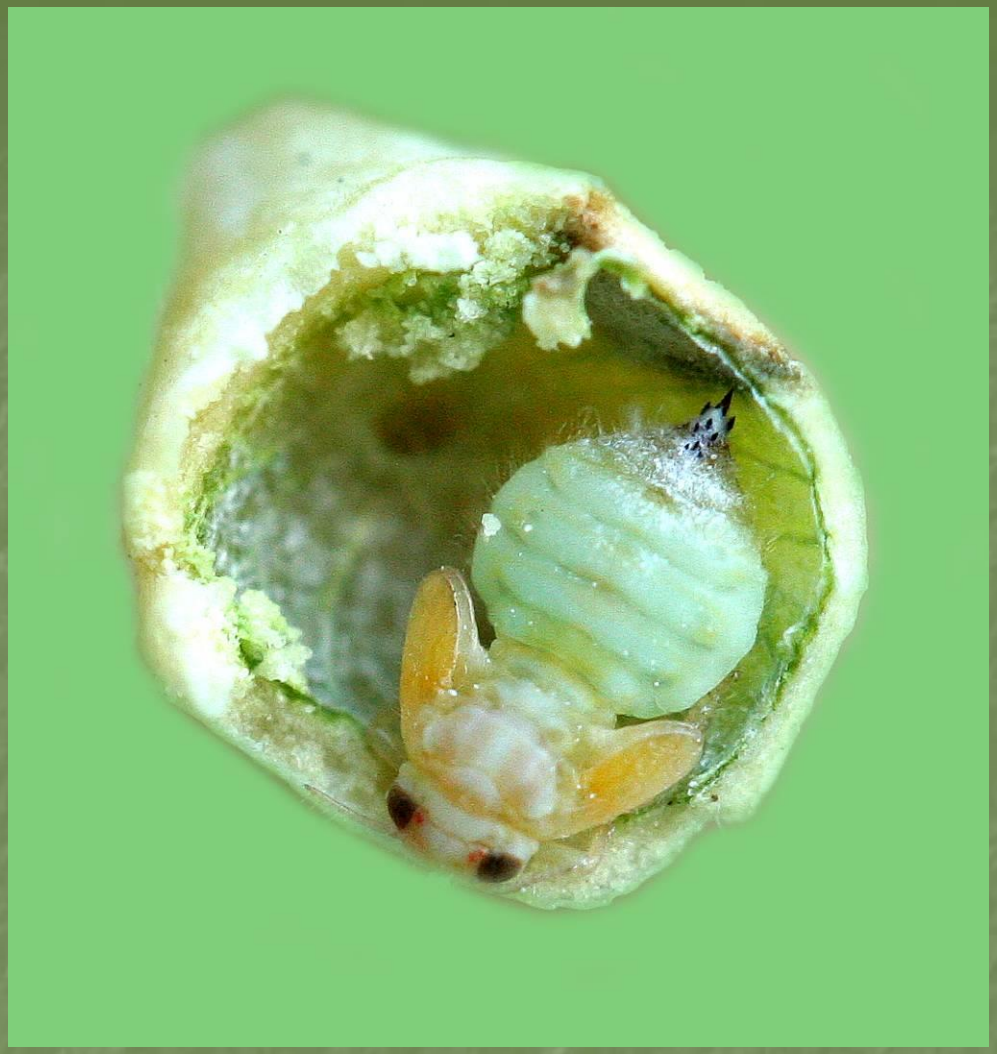
BLISTERGALLS
(made by *Pachypsylla celtidisvesicula*)

WHO EATS GALL PSYLLIDS WHEN?*

- **WINTER** - gleaners like creepers, chickadees, nuthatches, woodpeckers, and kinglets
- **SPRING** – passerine migrants plus the above
- **LATE SUMMER** – House Finch and Black-capped Chickadee
- **FALL** – All of the above

Certainly many other species than these.

*At Grandview Cemetery in Fort Collins, Larimer County, Colorado



Hackberry nipplegall removed from undersurface of leaf in October showing psyllid nymph (note: orange wing pads and pair of dark eyes at bottom) just prior to transformation to adult stage, emergence, short movement, and overwintering under bark.

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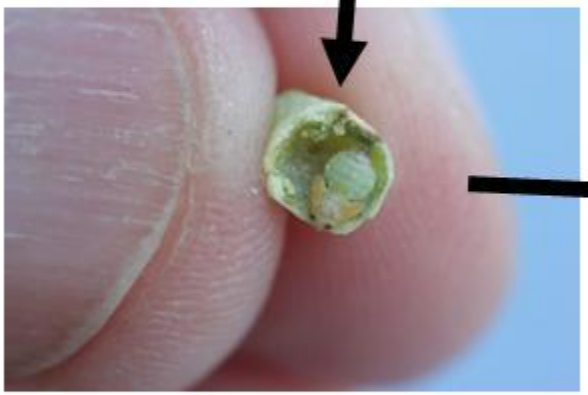
2



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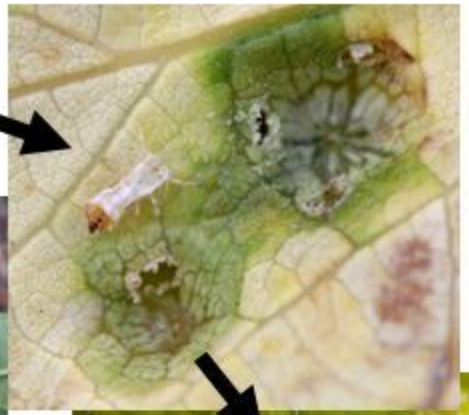

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HACKBERRY NIPPLEGALL PSYLLID

1- nipplegalls on bottom surface of leaf

2- removed gall showing nymph just prior to emergence, note orange wing pads)

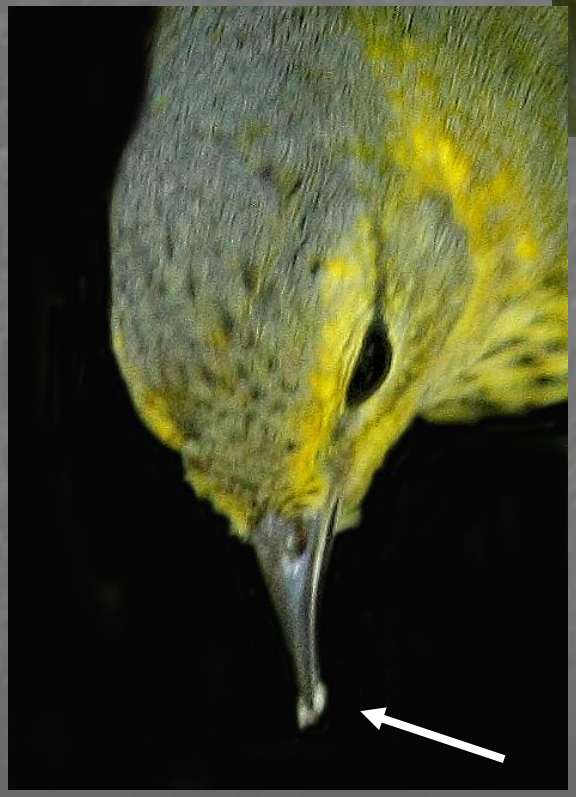
3- appearance of galls bitten off by squirrels or finches while nymphs still present

4- nymphs emerge from upper surface of leaf (four emergence holes shows), shed their skin (old skin shown), and obtain wings

5- teneral adult with unexpanded wings

6- teneral adult with expanded wings

7- hardened, darkened adult (stage that overwinters under bark, goes to buds next spring to lay eggs to start new cycle)



Cape May Warbler hunting adult psyllids that were seeking overwintering shelter in a spruce near a heavily-galled hackberry (Grandview Cemetery, FC, October 2013)

CHIRONOMID MIDGES

- Look like mosquitoes!
- Birders walking in wetlands often swarmed by big midge clouds
- Do NOT bite humans
- Present all year near open water
- Major target of "surface-nitpicking" birds of many types


FOSSIL CREEK RES


LAKE ESTES

HORNED GREBE GLEANING MIDGES AT FOSSIL CREEK RES

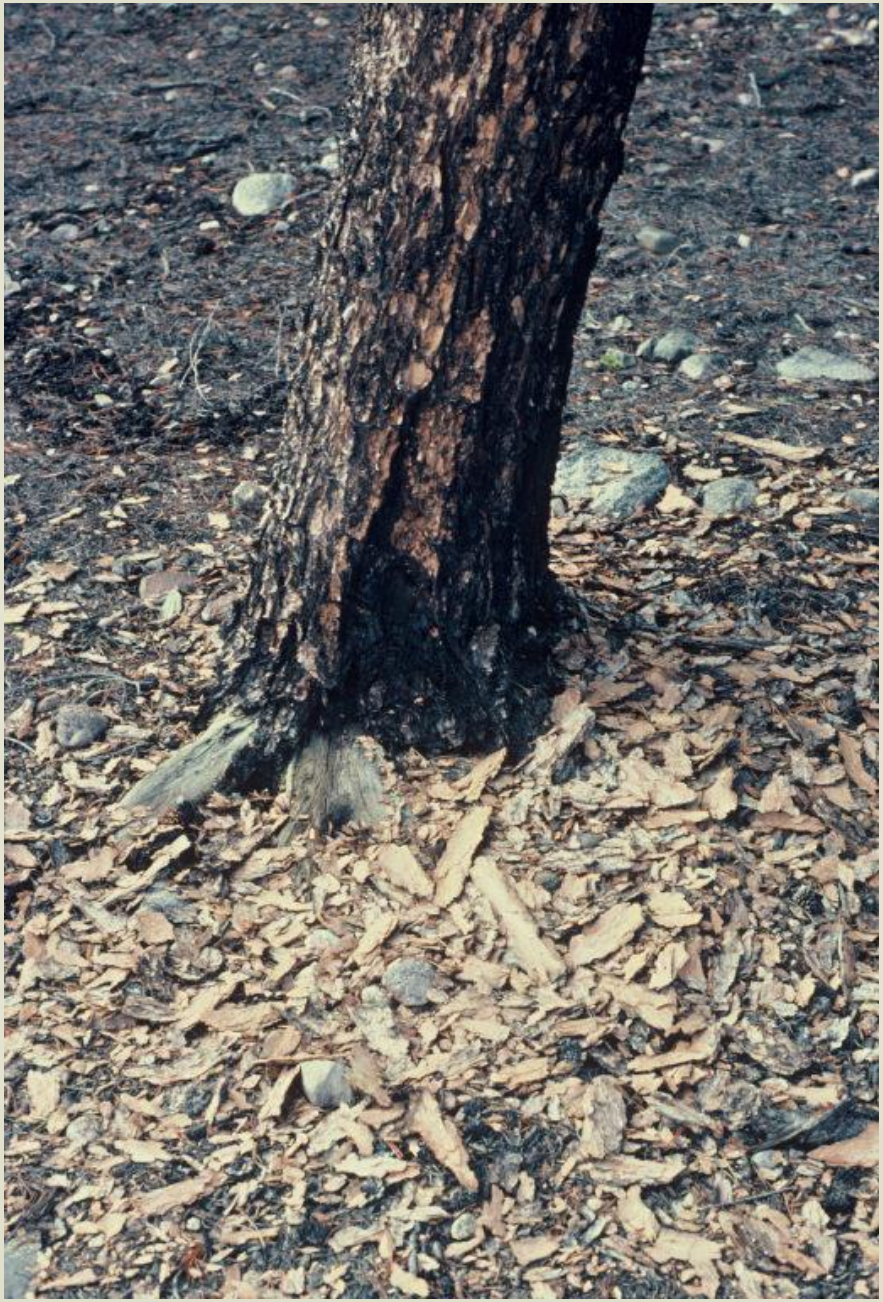
BONAPARTE'S GULLS GLEANING MIDGES FROM WINDSOR RESERVOIR SURFACE

BARK BEETLES AND WOOD-BORING BEETLES

- Staple of woodpeckers
- Because they reside under bark, require special tools and persistence to acquire
- The reason woodpecker populations spike following bark beetle epidemics and fires ("Woody" loves "Buford" loves "Smokey")

BARK BEETLE GALLERIES UNDER THE BARK AND PUPAE/LARVAE

WOODPECKER FEEDING ON BARK BEETLES AND WOOD-BORERS

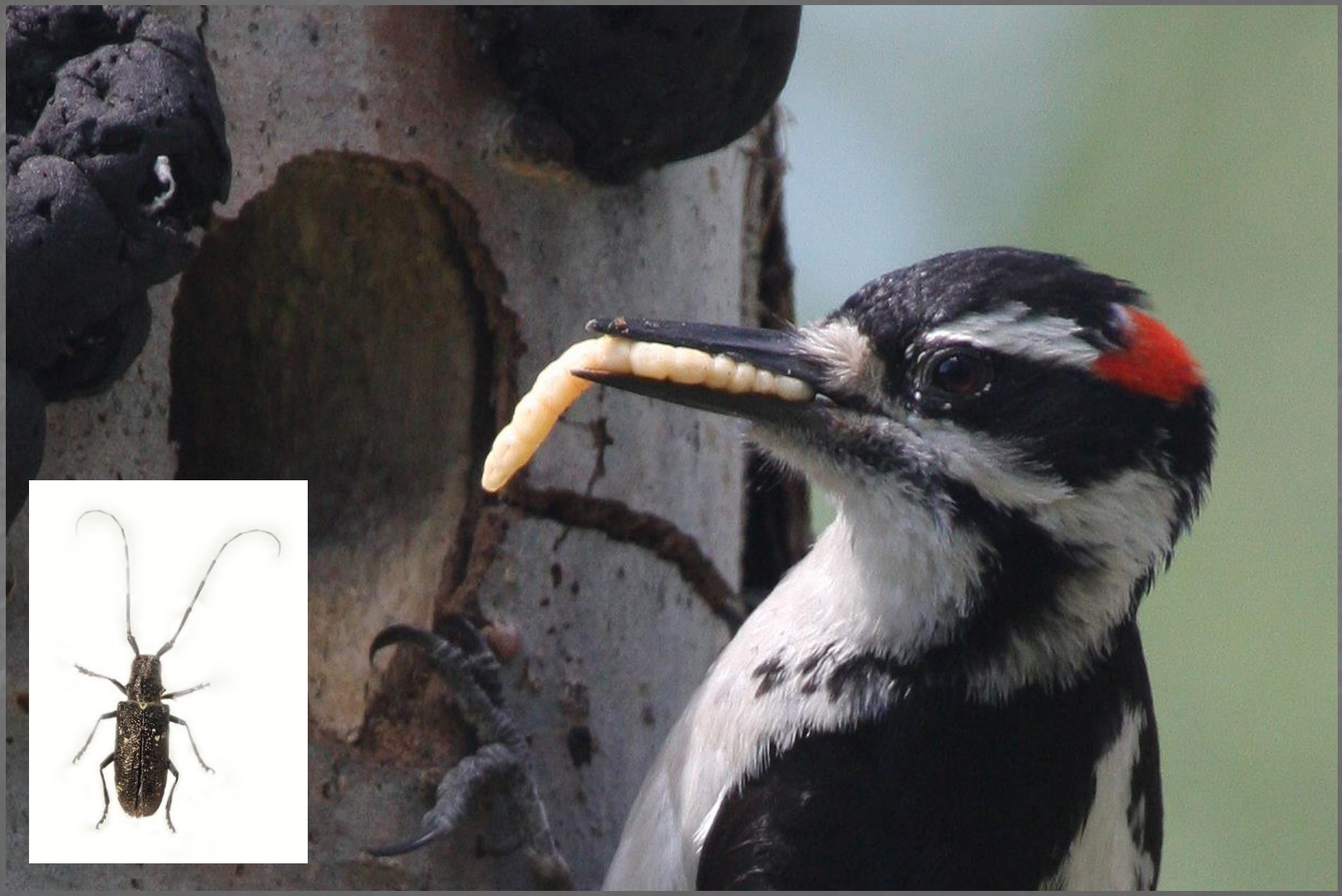


AMERICAN THREE-TOED WOODPECKER

Delivering longhorned wood borer larvae taken from pine beetle-killed ponderosa pine to nestlings in aspen cavity, Rist Canyon (above)

Going after bark beetles, probably *Ips pilifrons*, downed spruce, Grand Mesa (at left)

HAIRY WOODPECKER WITH LONGHORNED WOOD BORER LARVA AT NEST CAVITY, REDFEATHER LAKES, LARIMER COUNTY, CO



CATERPILLAR TRICKERY TO AVOID PREDATION

tents

orgami

aposematic coloration

mining

camo

hair

MILLERS

- Adult of the Army Cutworm (many other lookalike species)
- In cool season, the caterpillars (called "cutworms") feed on prairie plants
- Adult moths migrate to mt. meadows in late spring
- "What good are they!?"
- MAJOR food item for migrant birds (and grizzly bears!)

“CUTWORMS” (LARVAE OF THE “MILLER MOTH”)

MAJOR SPRING SNOWSTORM 2013

essentially all prairie birds, including the State Bird of Wyoming, feeding in desperation mode beside plowed roads, with many pulling cutworms from clumps of grass

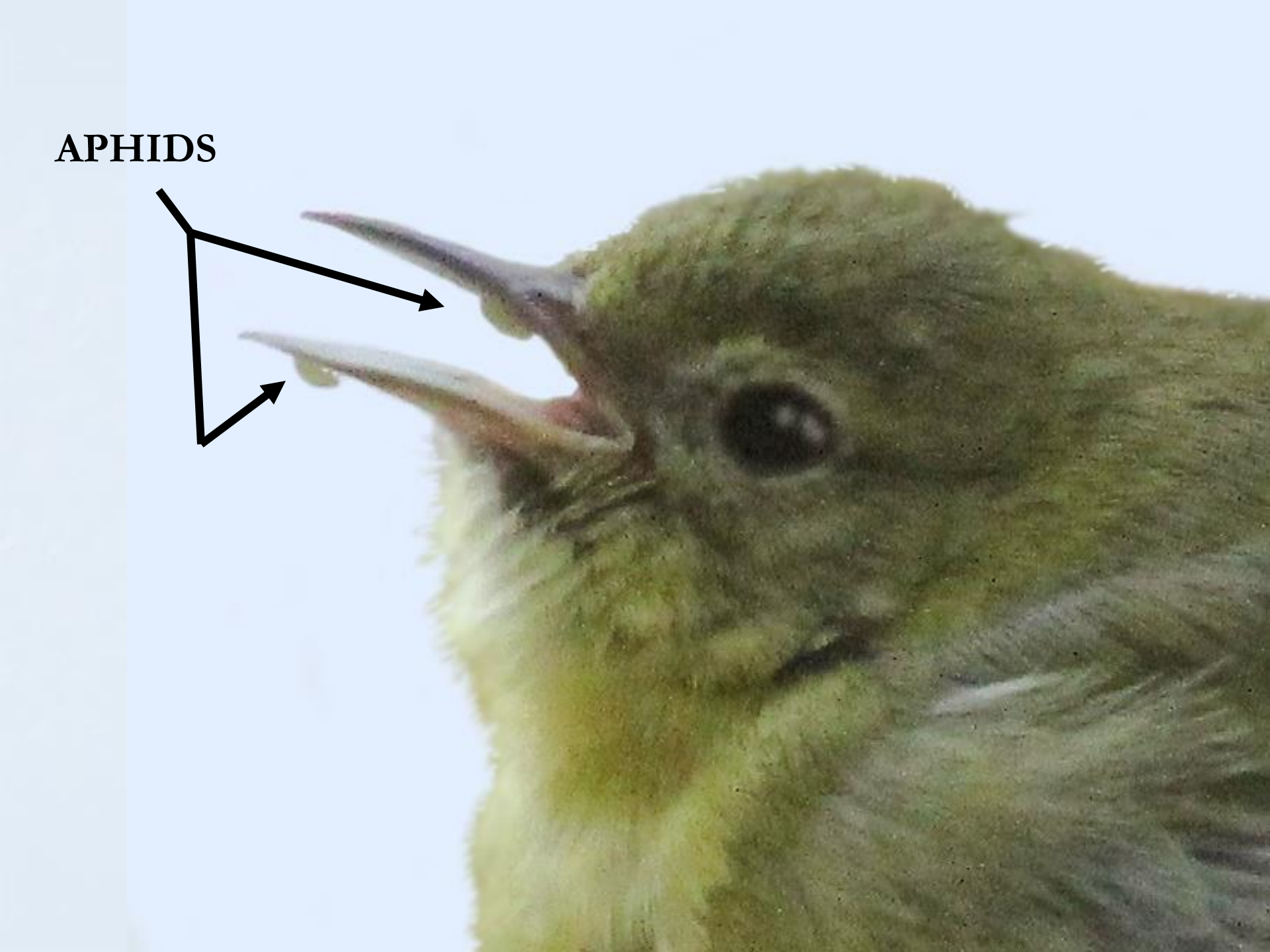
APHIDS
"BET YOU CAN'T EAT JUST ONE"

- Small insects of major importance to many passerine birds
- Small size dictates "nit picking" foraging style
- Carbohydrate pills
- Sugary honeydew excreted by aphids is also important
- Bobwhite ate 5000/day in one study

6-LEGGED MILK COWS

- Ants often "tend" aphid colonies, forcing honeydew production and, in turn, protecting them from predators
- Bird seeking aphids often also eat the ants & wasps attracted to honeydew.

APHIDS



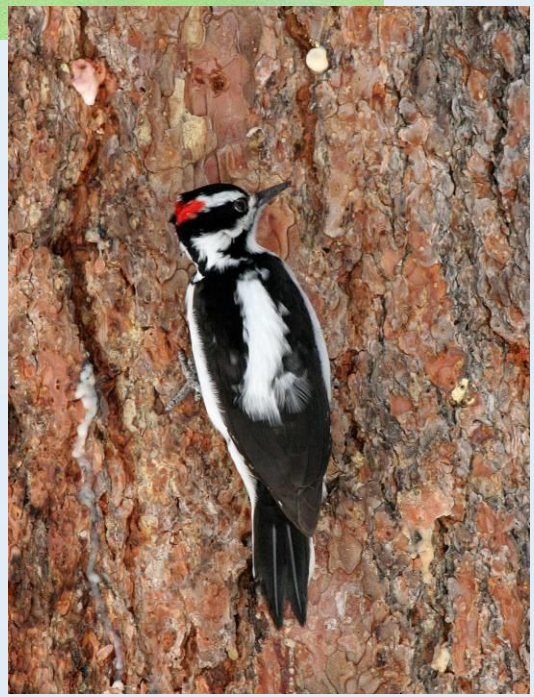
WRENS ARE MAJOR CONSUMERS OF ARTHROPODS

FLYING ANTS & TERMITES

(*Camponotus*, *Formica* and *Reticulitermes* species)

- Dispersal flights of all our ants and termites are major bird feeding events, both in the mountains and on the prairie
- Commonly occur following a warm rain
- Do you know how to tell an ant from a termite?

MAJOR MOUNTAIN BIRDS THAT EAT A LOT OF FLYING ANTS



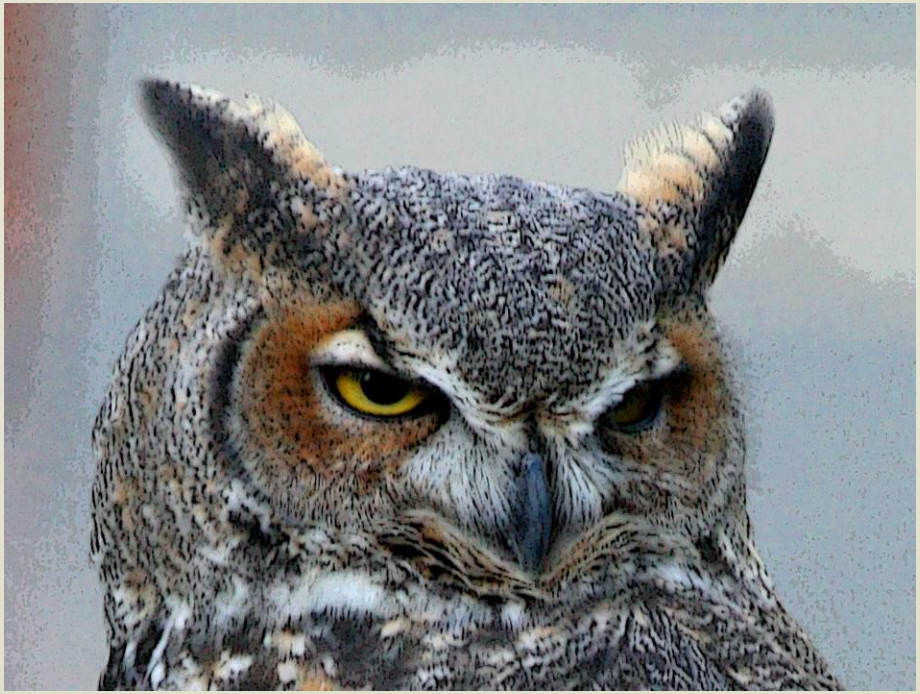
BIRDS EATING BIRDS

QUESTION ASKED OF READERS ON COBIRDS BACK IN THE EARLY 2000s:

WHICH PREDATOR WILL BENEFIT MOST FROM THE DRAMATIC EXPANSION OF EURASIAN COLLARED-DOVES IN THE WEST?*

AND THE WINNERS ARE…..

- Cooper's Hawk
- Great Horned Owl



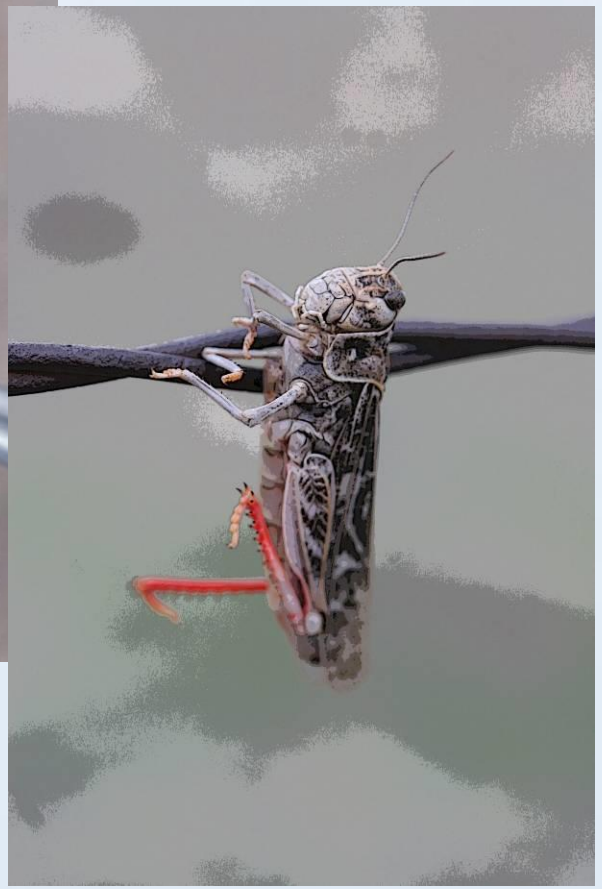
SHRIKES

IMPALING

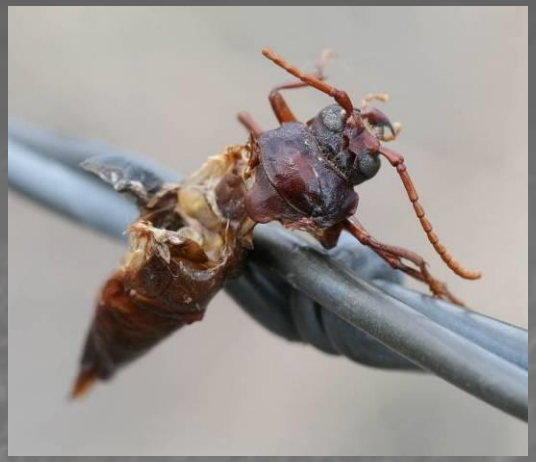
- Signature habit of shrikes
- “Old school” method was thorns
- “New school” method is barbed wire
- A way to hold/cache prey
- “Look at me, I am a good provider”
- Other purposes?

#1 ITEM: *Xanthippus* grasshoppers

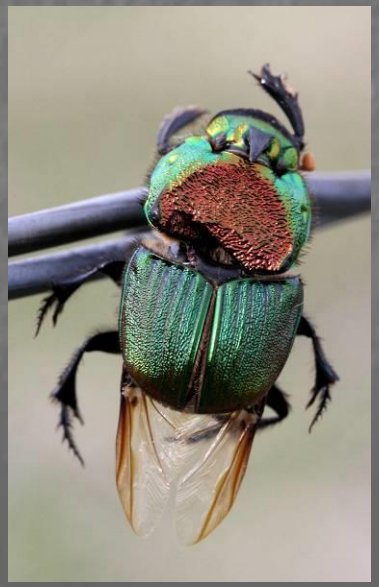
(*X. corallipes,* which is quite common, is called the "redshank" because of its bright red inner "thighs")



autumn nymph

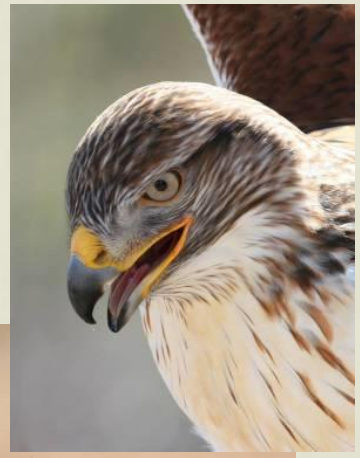



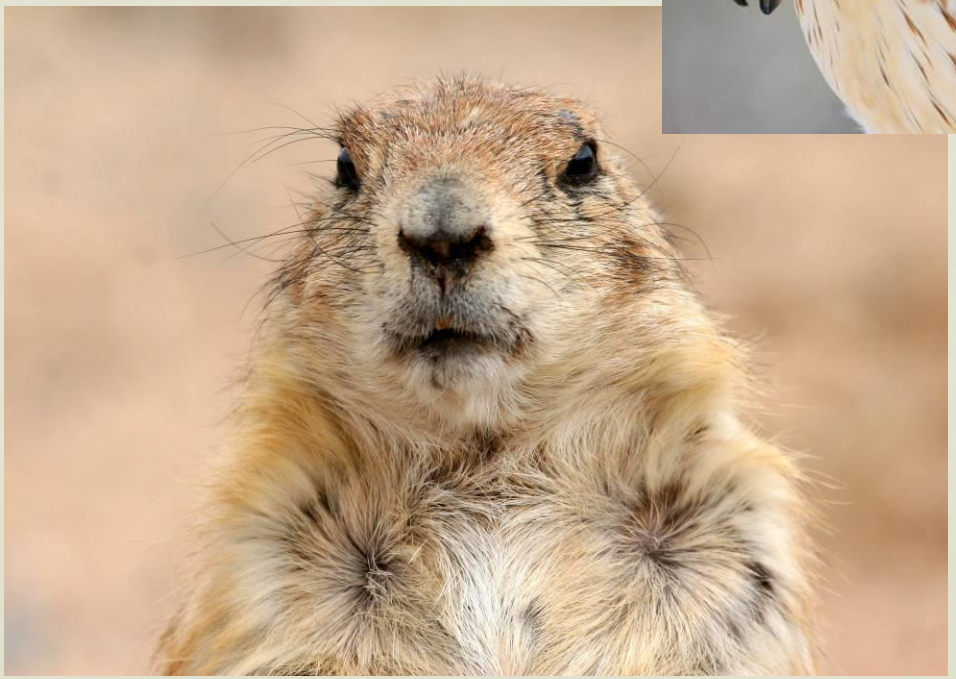





BLACK-TAILED PRAIRIE-DOG: KEY BIRD FOOD RESOURCE

- Ferruginous Hawk
- Golden Eagle
- Other benefits
  - Their holes are used by Burrowing Owls
  - Mountain Plovers, Horned Larks and other spp. feed on "mowed" prairie
  - Great fodder for argument at the bistro





VOLES, DEER MICE, ETC.

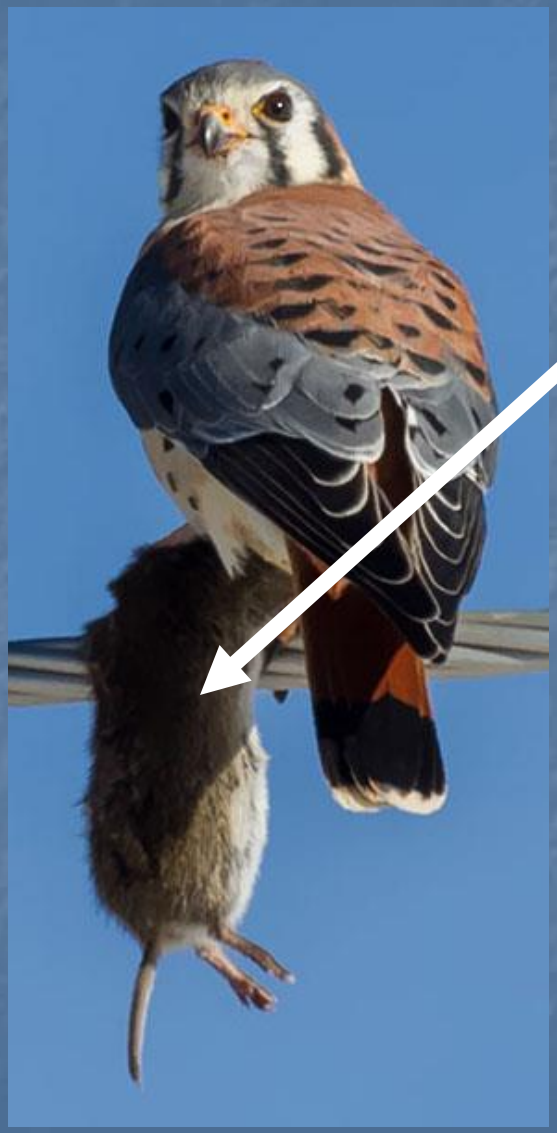


Photo by Tom France

- *Microtus* (vole), many species, small ears, short tails
- *Peromyscus* (deer mice), many species, big ears, long tail
- Lots of other small rodent genera

VOLE

DEER MOUSE

CRAYFISH

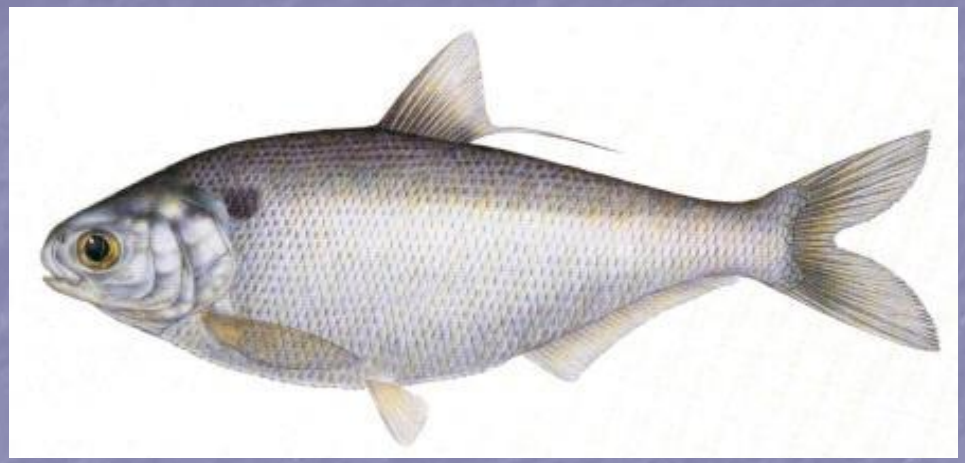
- MAJOR source of food for Colorado's diving waterfowl, gulls, waders, and others (90 CO bird species)
- 7 crayfish species in Colorado (all but one in genus *Orconectes*)
- Usually, birds discard the claws

White-winged scoter with crayfish, Boulder Co., CO, December 2008 by David Waltman

Ring-billed Gull declawing crayfish prior to eating the body tailfirst, always tailfirst.

A FRENZY. WE'VE ALL SEEN IT. WHAT IS GOING ON?

GIZZARD SHAD



- To CO fish-eating birds, small shad are important
- Big flocks of mergansers and gulls in a reservoir almost always indicate schools of shad
- Birders owe shad for many rare birds on their life lists (Ross's Gull at Cherry Creek, for example)

EAT AT THE GRILL

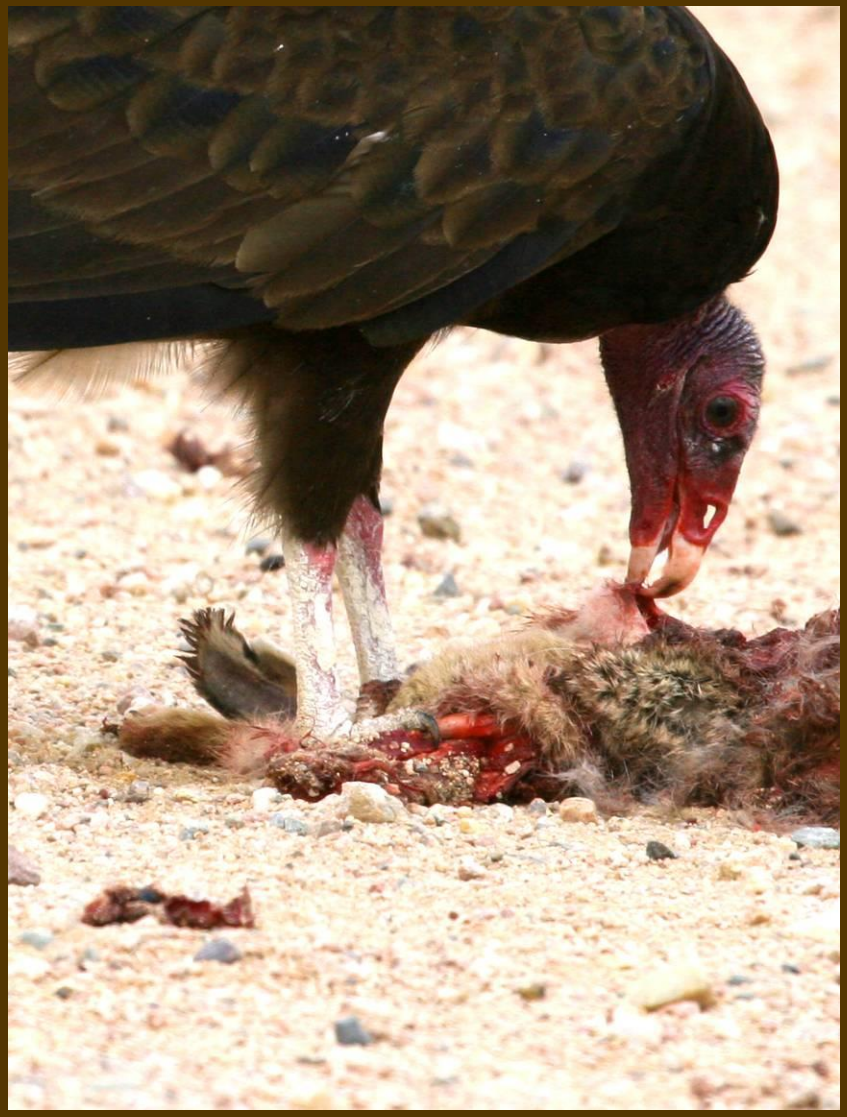
- Evidence that birds are adaptive opportunists
- A fairly new phenomenon?
- Many birds have learned "grilled" insects are abundant and tasty

Model –T Ford, made the same year (1926) as the first report of House Sparrows eating from the auto grills.

SCAVENGERS

- Thank goodness they exist
- "Ice-off" time in Feb-March exposes dead fish
- Vultures and many other species clean up roadkill

TURKEY VULTURE



What's on the menu:

Sunday – Black-tailed Jackrabbit

Monday – ditto

Tuesday – ditto

Wednesday – Whatever

Thursday – Black-tailed Jackrabbit

Friday – ditto

Saturday - ditto

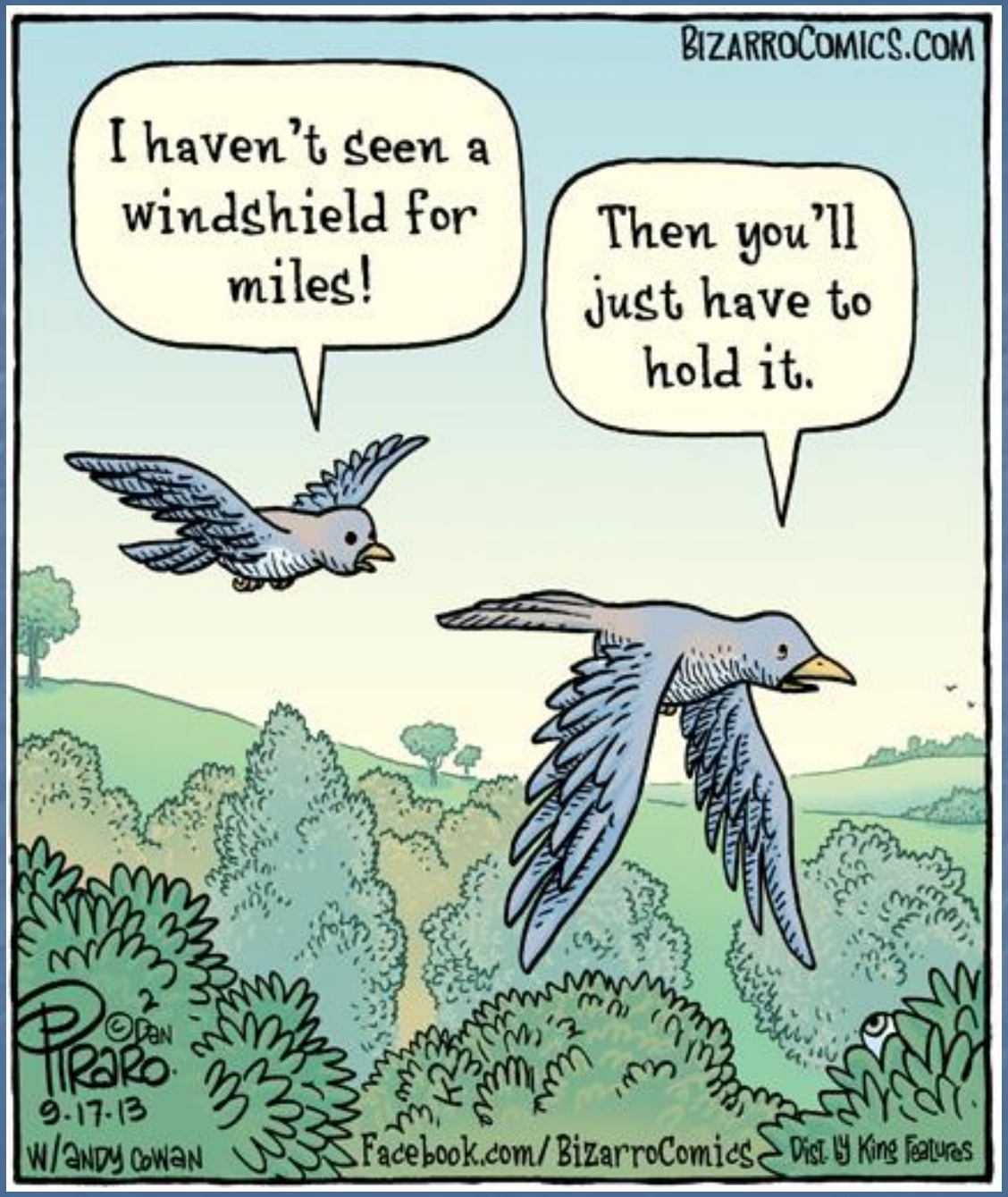
HOW CURIOSITY ABOUT FOOD HABITS CAN MAKE YOU A BETTER BIRDER

- See more birds
- Better understand habitats
- Better predict where birds will be
- Forecast the weather?
- Be a better field trip leader
- Be a better atlaser
- Be a better teacher
- Be a better advocate and conservationist
- Be a better naturalist

PARTING QUESTIONS

- What did the Red-flanked Bluetail eat while it was in Laramie in Nov. 2019?
- What did the King Eiders eat at Lake Hattie Reservoir last year?
- What do the birds eat <u>besides</u> feeder offerings in your yard?

“THE HUNGRY BIRD” (THB) is a column I have been writing quarterly in the journal “Colorado Birds” since April 2010. So far, there are 53 articles in this series digging deeper into many of the topics covered tonight. All issues of “Colorado Birds”, including THB articles, are archived on the website of the Colorado Field Ornithologists. Alas, you must be a CFO member to access them.


BIZARROCOMICS.COM
I haven't seen a windshield for miles!
Then you'll just have to hold it.
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THANK YOU FOR ATTENDING TONIGHT.