



Phenology in the Raccoon River Watershed

Lee Searles, PhD

Ecological consultant & small business owner

Trained Wetlands Delineator

Botanical inventories, Monarch habitat, restoration ecology

Iowa Master Conservationist & River Steward

IOWATER Volunteer Water Quality Monitor

What is *phenology*? Why pay attention to it?

- Natural cycles
- The timing of interactions & activities of living things
 - Determined by
 - Adaptations to sunlight & seasons
 - Resource availability
 - Landforms
 - Surface modification (glaciers, fire)
- Life
 - on the planet depends on these cycles & resources
 - Humans haven't fully "liberated" themselves from natural limits
- Phenology is an ecological approach
 - The whole is greater than the sum of its parts
 - Interdependency: "butterfly effect"
 - Means of reintegrating ourselves with natural processes

A scenic winter landscape featuring a river with rapids. The banks are covered in snow, and the trees are bare. The sky is blue with some clouds. The word "WINTER" is written in large white letters inside a white-bordered box in the center of the image.

WINTER

LENON MILL PARK, PANORA,
MIDDLE RACCOON

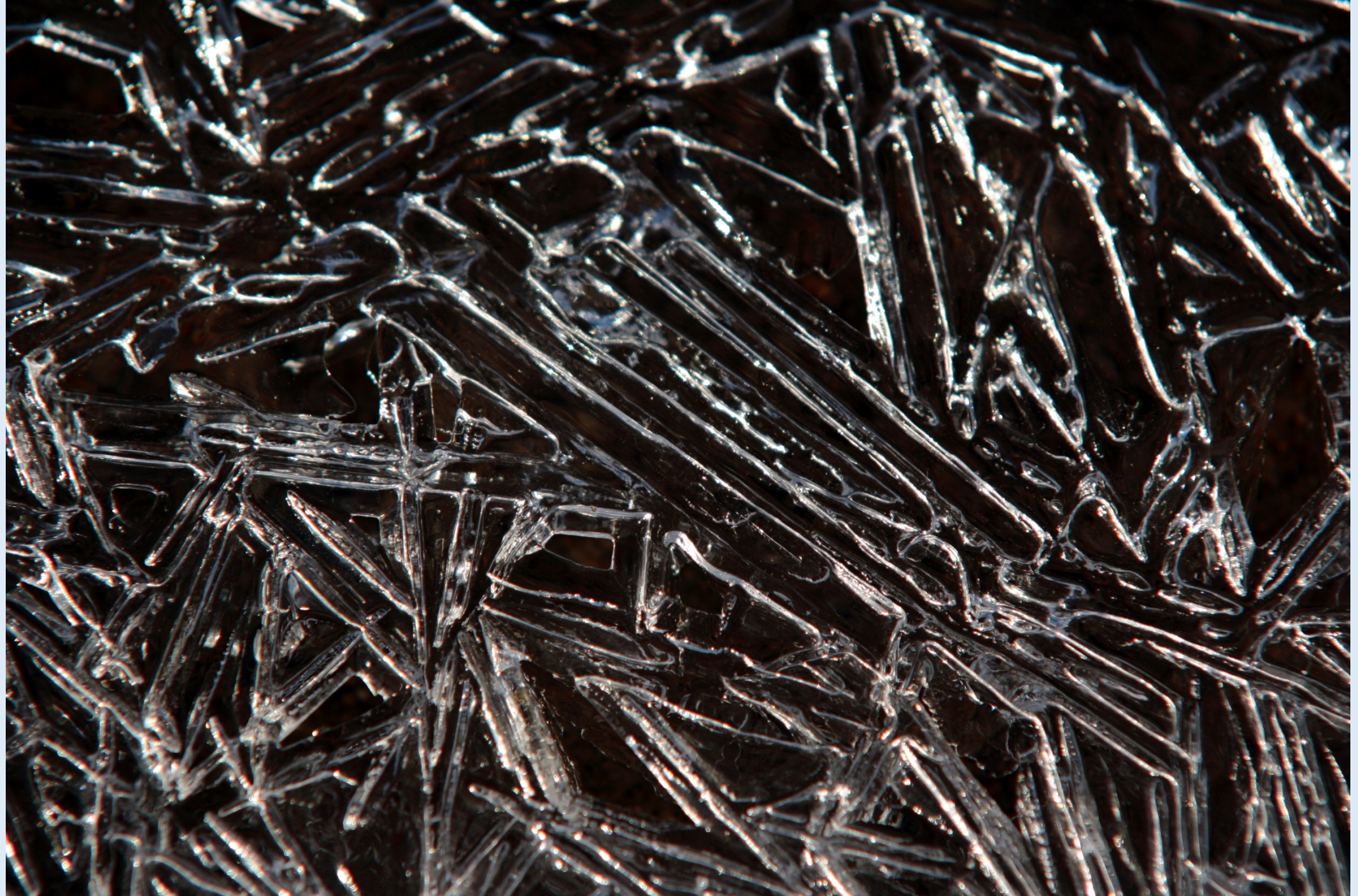


Patterns in River Ice

Delaney Cabin, North Raccoon

Carolina Wren





BLACK- CAPPED CHICKADEE

LOWER RACCOON,
DES MOINES





WIND ARC IN SAND

DELANEY CABIN, NORTH
RACCOON

CANADA WILD RYE

Des Moines, Lower Raccoon



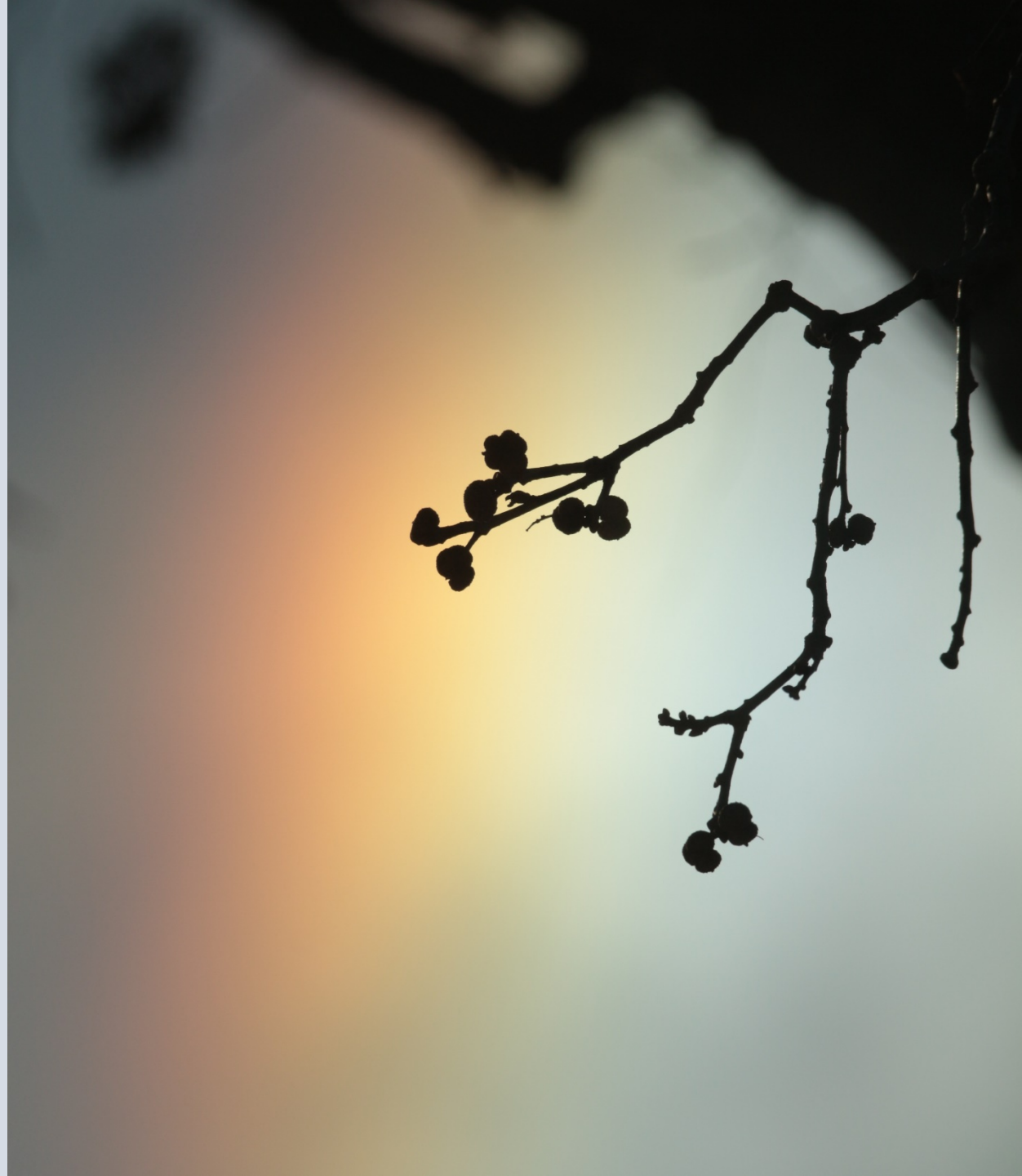


BLUE JAY

LOWER RACCOON,
DES MOINES

ACORNS
AGAINST A
SOLAR
PARHELION

Des Moines, Lower Raccoon





BEAVER TRACKS & DRAG MARKS

Snyder Access, North Raccoon

SHARP- SHINNED HAWK

Des Moines, Lower
Raccoon







SPRING

TIPTON PRAIRIE, GREENE COUNTY





SNOW TRILLIUM

LONG CREEK BLUFF,
WHITEROCK
CONSERVANCY



GREATER YELLOWLEGS

VOAS NATURE CENTER



HISPID BUTTERCUP

DELANEY CABIN, NORTH RACCOON

WHITE MILLER CADDISFLY

LOWER RACCOON, ON RIVER TERRACE VEGETATION





STREAM MAYFLY (*McCaffertium*)

LOWER RACCOON, DES MOINES

A vibrant red Summer Tanager is perched on a tree branch, facing left. The bird's plumage is a bright, uniform red, with a slightly darker red on its wings and tail. Its beak is a pale yellowish-green. The tree branch is textured and greyish-brown. The background is a soft, out-of-focus green.

SUMMER TANAGER

GREENWOOD PARK, DES
MOINES, LOWER
RACCOON



CELLOPHANE BEE

ON GOLDEN ALEXANDERS, RAINGARDEN, LOWER RACCOON



Blue-Gray Gnatcatcher

(female)

North Walnut Creek, Clive



LARGE CARPENTER BEE

ON GOLDEN ALEXANDERS, LOWER RACCOON, DES MOINES



Tiger Beetle
Pleasant Valley WMA



OHIO SPIDERWORT

GRAY'S LAKE, LOWER RACCOON, DES MOINES



SUMMER

RESTORED UPLAND PRAIRIE,
KUEHN CONSERVATION CENTER



BROWN-BELTED BUMBLEBEE

ON ANISE HYSSOP,
NATIVE PLANT RESTORATION,
DES MOINES

A close-up photograph of a sideoats grama stem. The stem is green and runs horizontally across the top of the frame. From the stem, several flower heads hang down. Each flower head is composed of multiple spikelets. The spikelets are primarily purple and green, with some showing bright orange or red at their tips. The background is a soft, out-of-focus green.

SIDEOATS
GRAMA IN
BLOOM

LOWER RACCOON, DES MOINES



EASTERN MEADOWLARK

WHITEROCK CONSERVANCY



COMMON EASTERN BUMBLE BEE

ON PINK TURTLEHEAD,
LOWER RACCOON, DES
MOINES

AMERICAN BEAKGRAIN

LOWER RACCOON, DES MOINES





ORCHARD ORIOLE

LOWER RACCOON,
DES MOINES

A close-up photograph of a Least Skipper butterfly perched on a pink flower with a yellow center. The butterfly has orange wings with a dark border and a white patch on its thorax. The background is a soft-focus green.

LEAST SKIPPER

NATIVE PLANT
RESTORATION,
DES MOINES

BIG BLUESTEM IN FLOWER



BROAD- WINGED HAWK

ASHWORTH PARK, DES MOINES





GREEN SWEAT BEE

(Augochlora pura)

ON NARROW-LEAVED MOUNTAIN MINT, LOWER RACCOON



AUTUMN

RIVER BANK, LOWER RACCOON
DES MOINES WATER WORKS PARK

LONG- HORNED BEE

ON NEW ENGLAND
ASTER,
LOWER RACCOON



CRETACEOUS
DELTA SANDBAR
DEPOSITS
WHITEROCK CONSERVANCY



CLOUDED SULPHUR

WHITEROCK CONSERVANCY





CANADA GOOSE

Snake Creek Marsh, Greene County

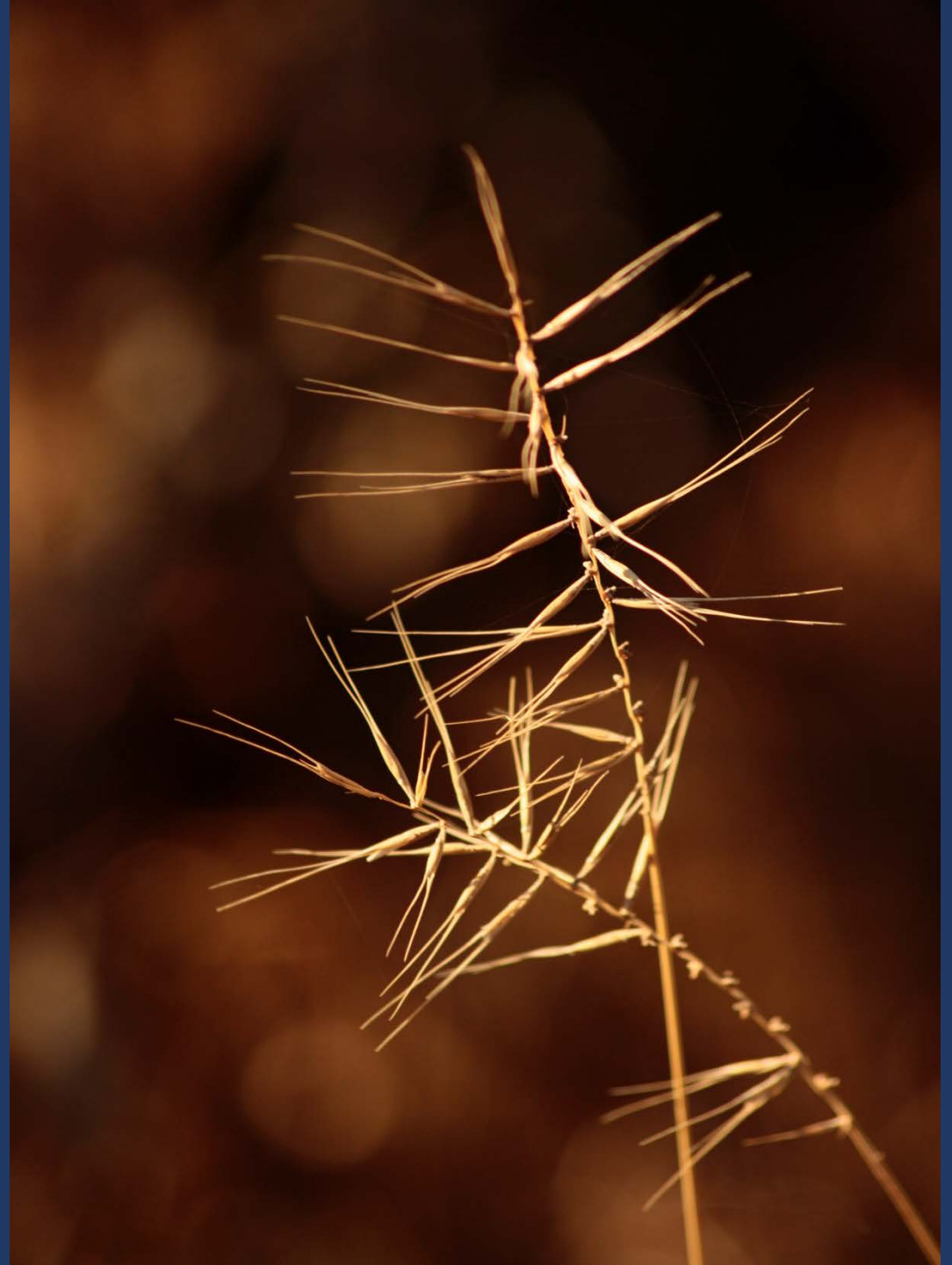


COMMON MILKWEED

LOWER RACCOON, DES MOINES

BOTTLEBRUSH GRASS

WHITEROCK CONSERVANCY





JUVENILE & FIRST YEAR

- Mostly dark: head, chest, tail, flight feathers
- Dark brown belly
- Some white in underwing coverts



SECOND WINTER

- Uneven trailing edge from molt
- White shows in face, on belly, & in tail
- Mostly dark chest



THIRD WINTER

- Mostly dark chest, belly, underwings
- Trailing edge even or with fewer old feathers
- Mostly dark chest
- Osprey-like head pattern



FOURTH WINTER

- Bill usually all yellow
- Head & tail almost all white
- Body & wings nearly all dark
- FIFTH WINTER: adult color pattern

WHITE OAK, TONAWANDA RAVINE, DES MOINES
SEEDLING IN 1857, FELLED BY WIND, APRIL 2012

