

# Community-based dragonfly & damselfly monitoring in Johnson Creek watershed



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**Johnson Creek Watershed Council**

**Volunteer training**

**3 June 2017**

Cardinal Meadowhawk male; C.A.S. Mazzacano



# Goals

- understand main elements of odonate ecology
- distinguish genders, life stages, and behaviors
- recognize common species in the watershed
- learn key components for identification
- know monitoring protocol and reporting methods





# Meet the odonates

>5952 species in the world

462 spp. in North America

93 spp. in Oregon

40 spp. in Multnomah Co.



Variable Darner (*Aeschna interrupta*),  
C.A.S. Mazzacano



Sierra Madre Dancer (*Argia lacrimans*),  
C.A.S. Mazzacano



Dragonlet (*Erythrodiplax* sp.),  
C.A.S. Mazzacano



# Meet the odonates

5 species in N. America  
are annual long-distance  
migrants:

Common Green Darner  
Variegated Meadowhawk  
Black Saddlebags  
Wandering Glider  
Spot-winged Glider





# Meet the odonates

aquatic nymphs



terrestrial adults





Twelve-spotted Skimmer (*Libellula pulchella*),  
C.A.S. Mazzacano

large body

wider abdomen

eyes touch or nearly so

hindwings broader than forewings

perch with wings horizontal





Twelve-spotted Skimmer (*Libellula pulchella*),  
C.A.S. Mazzacano



Sooty Dancer (*Argia lugens*), C.A.S. Mazzacano

large body

wider abdomen

eyes touch or nearly so

hindwings broader than forewings

perch with wings horizontal

small body

narrow abdomen

eyes separated

equal-sized, stalked wings

perch with wings folded



stout, jet-propelled  
dragonfly nymphs

slender, minnow-like  
damselfly nymphs



Damselfly  
nymph  
swimming



nymphs use hinged, toothed, extendible  
“lower lip” (labium) to catch prey





adults use basket-like legs to  
catch prey & bring it to mouth



nymphs molt through  
multiple stages (instars)

wing pads develop as  
nymphs grows



Damselfly nymph; C.A.S. Mazzacano



Damselfly nymph; Society for Freshwater Science



final instar nymphs stops  
feeding, leaves water,  
finds perch



larval skin splits &  
new adult (teneral) emerges



teneral has soft body,  
pale color, weak flight

days to develop to full  
color & sexual maturity



teneral Snaketail, C.A.S. Mazzacano



Boreal Snaketail (*Ophiogomphus colubrinus*);  
C.A.S. Mazzacano



# dragonfly emergence





Color development  
continues with age



Vivid Dancer (*Argia vivida*) mal, immature;  
C.A.S. Mazzacano

Males and females  
look very different



Common Whitetail (*Plathemis lydia*) male,  
C.A.S. Mazzacano



Vivid Dancer (*Argia vivida*) mal, mature;  
C.A.S. Mazzacano



Common Whitetail (*Plathemis lydia*)  
female, C.A.S. Mazzacano



males patrol water to  
guard territory, find mates

females avoid water until  
ready to mate



Band-winged Meadowhawk (*Sympetrum semicinctum*) male;  
C.A.S. Mazzacano



Band-winged Meadowhawk (*Sympetrum semicinctum*) female;  
C.A.S. Mazzacano



mating lasts minutes to hours

females lay eggs soon after  
mating



Common Green Darners (*Anax junius*);  
C.A.S. Mazzacano



Tule Bluets (*Enallagma carunculatum*);  
C.A.S. Mazzacano



eggs inserted in plants,  
sediment, mud, or on water

female may be guarded by  
male or oviposit alone



Mosaic Darner;  
C.A.S. Mazzacano



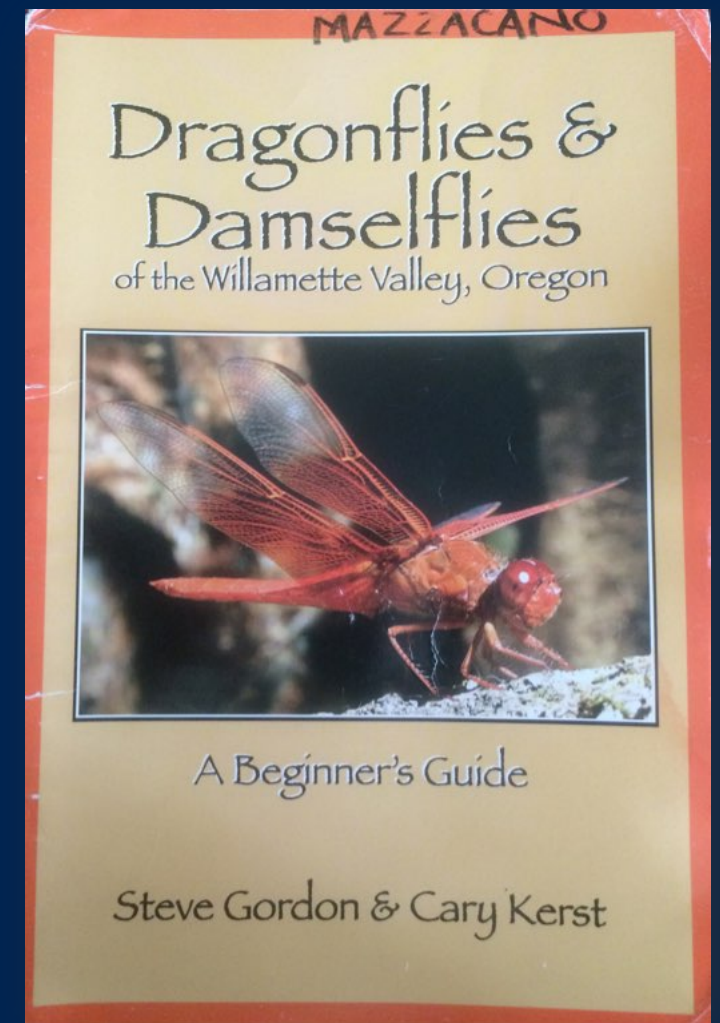
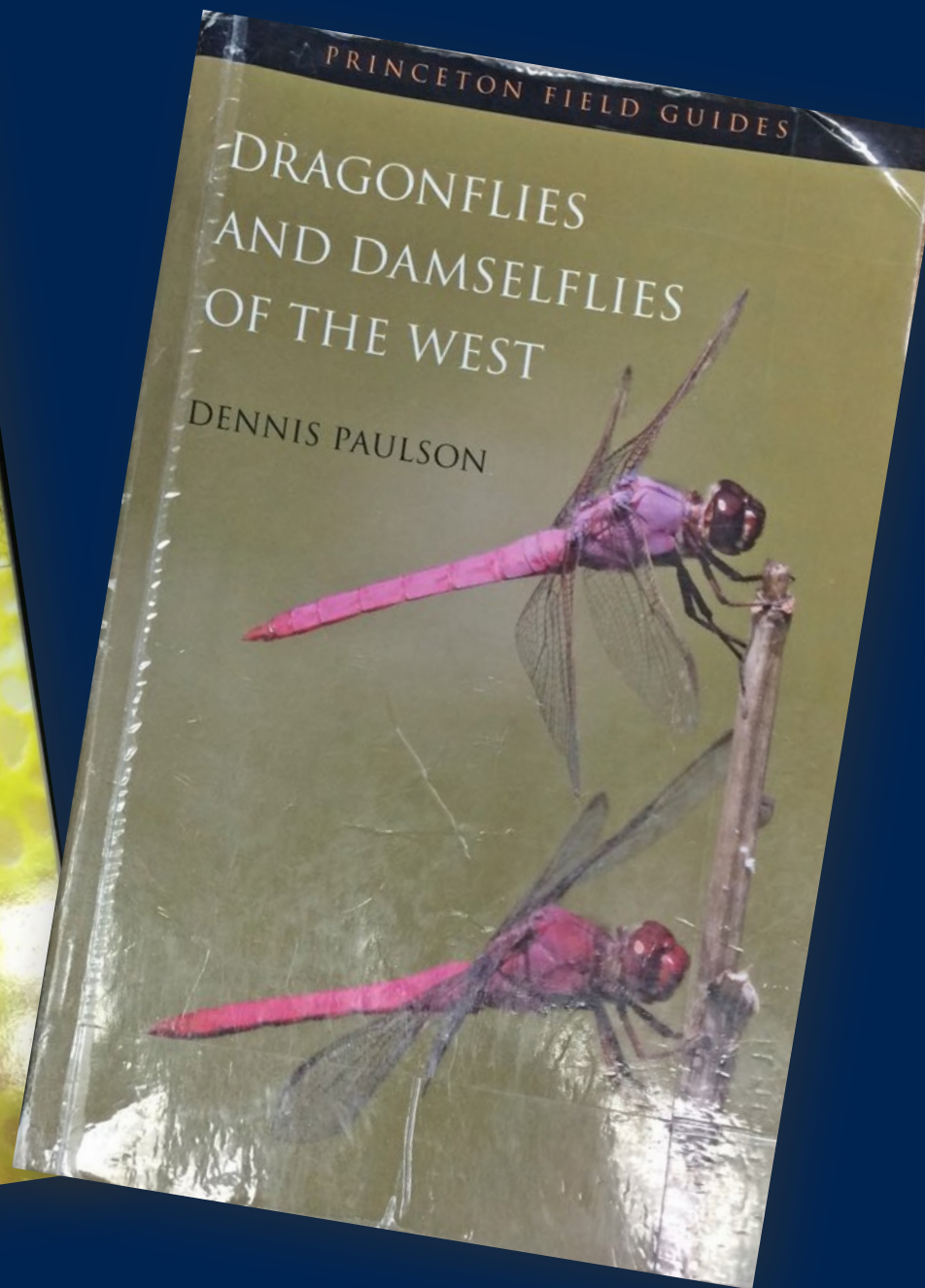
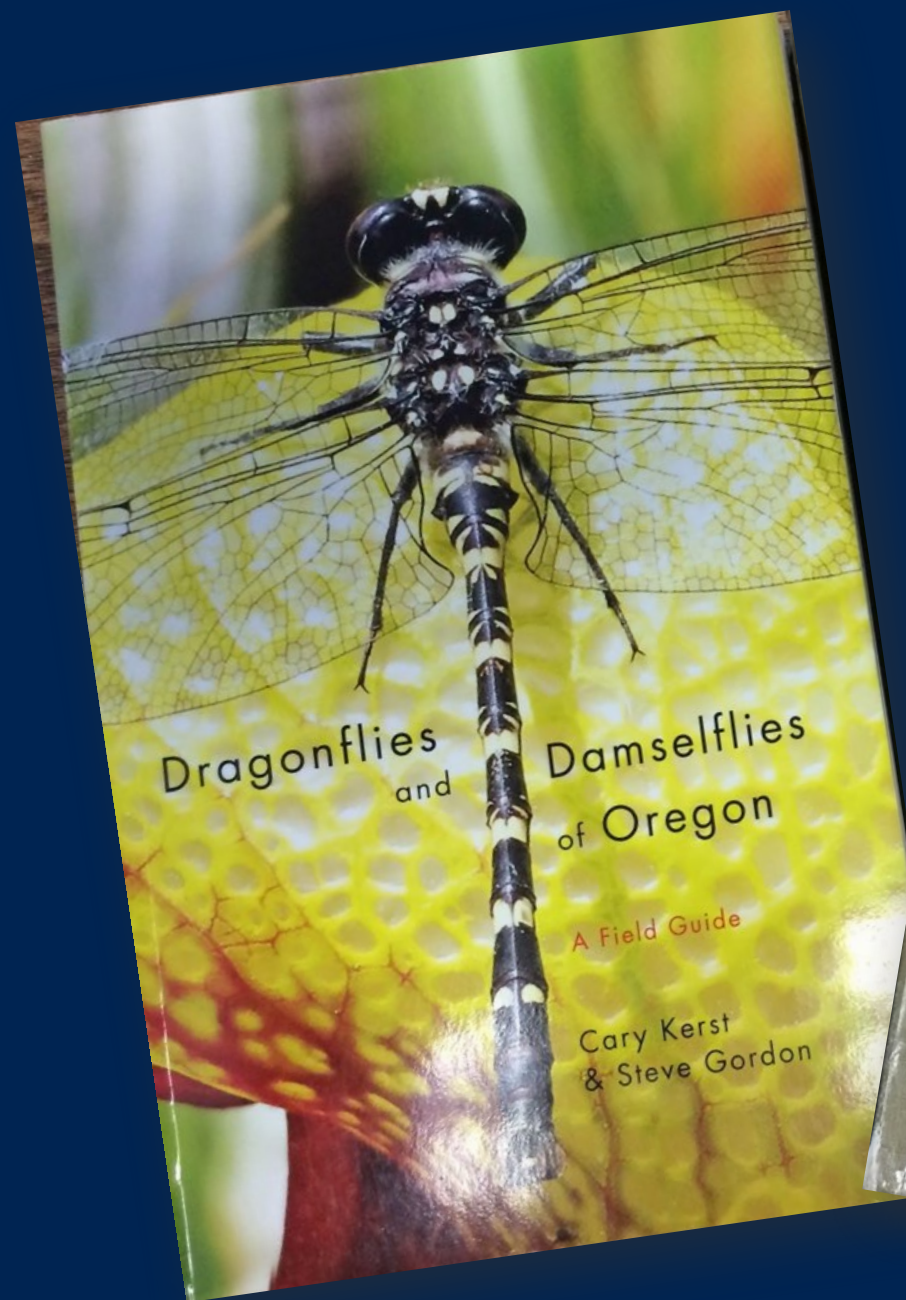
Common Green Darners (*Anax junius*);  
C.A.S. Mazzacano



Sooty Dancers (*Argia lugens*);  
C.A.S. Mazzacano



# Odonate Resources





# Odonate Resources



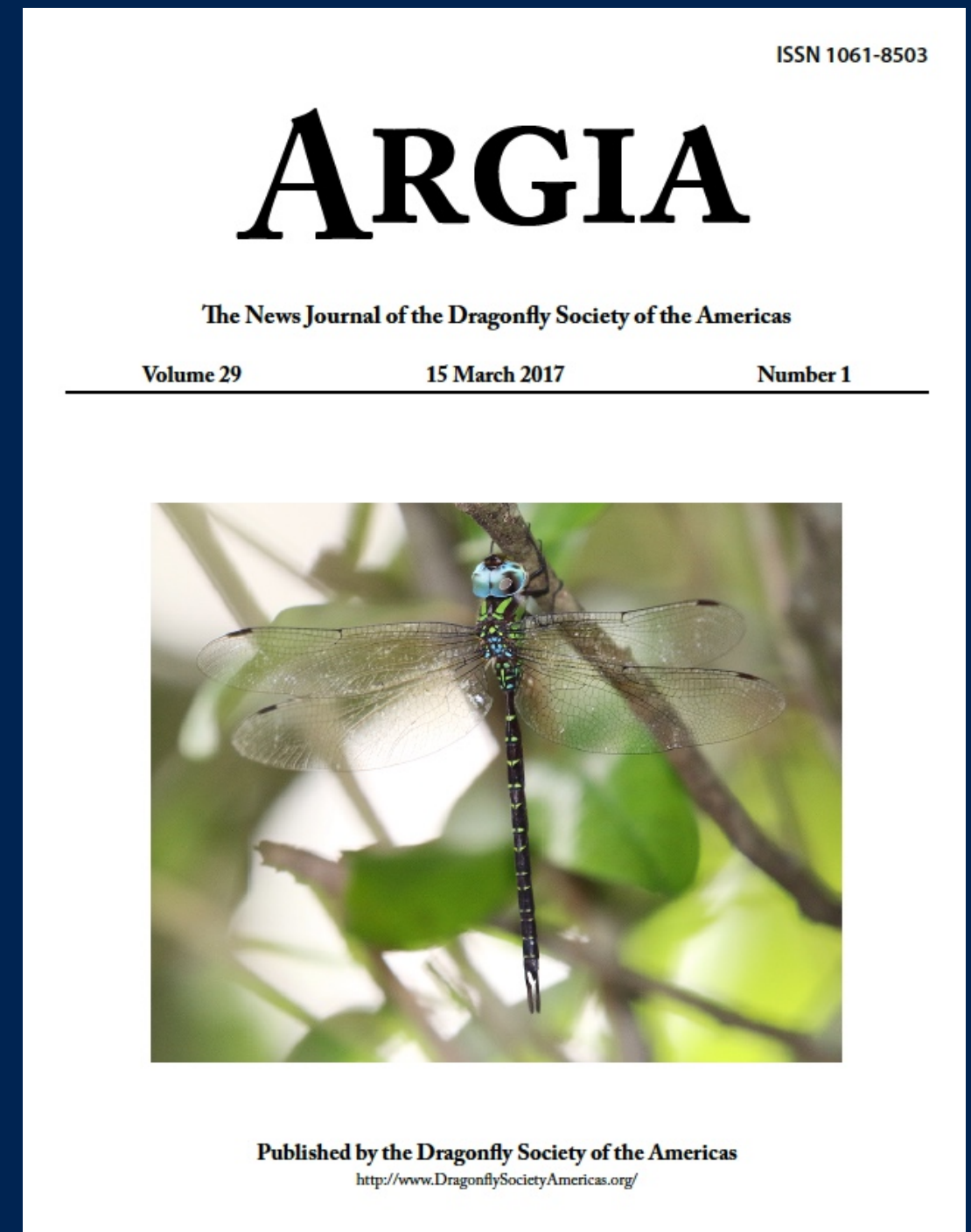
## Mission Statement

The Dragonfly Society of the Americas advances the discovery, conservation and knowledge of Odonata through observation, collection, research, publication, and education.



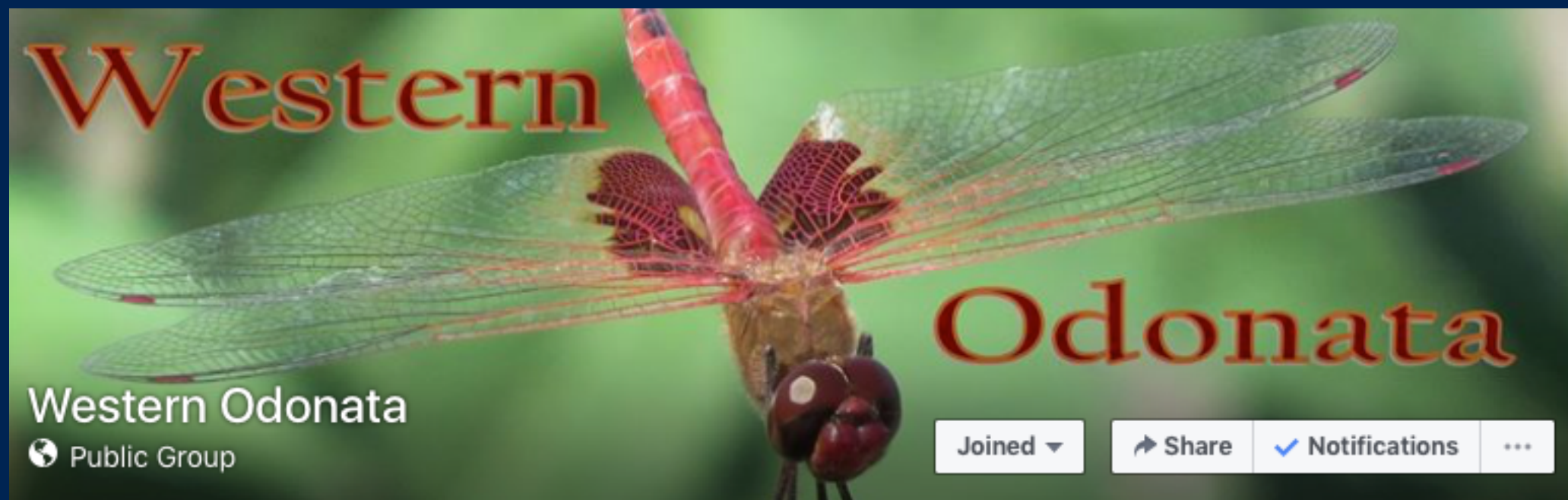
9-11 June 2017

Staunton, VA





# Odonate Resources





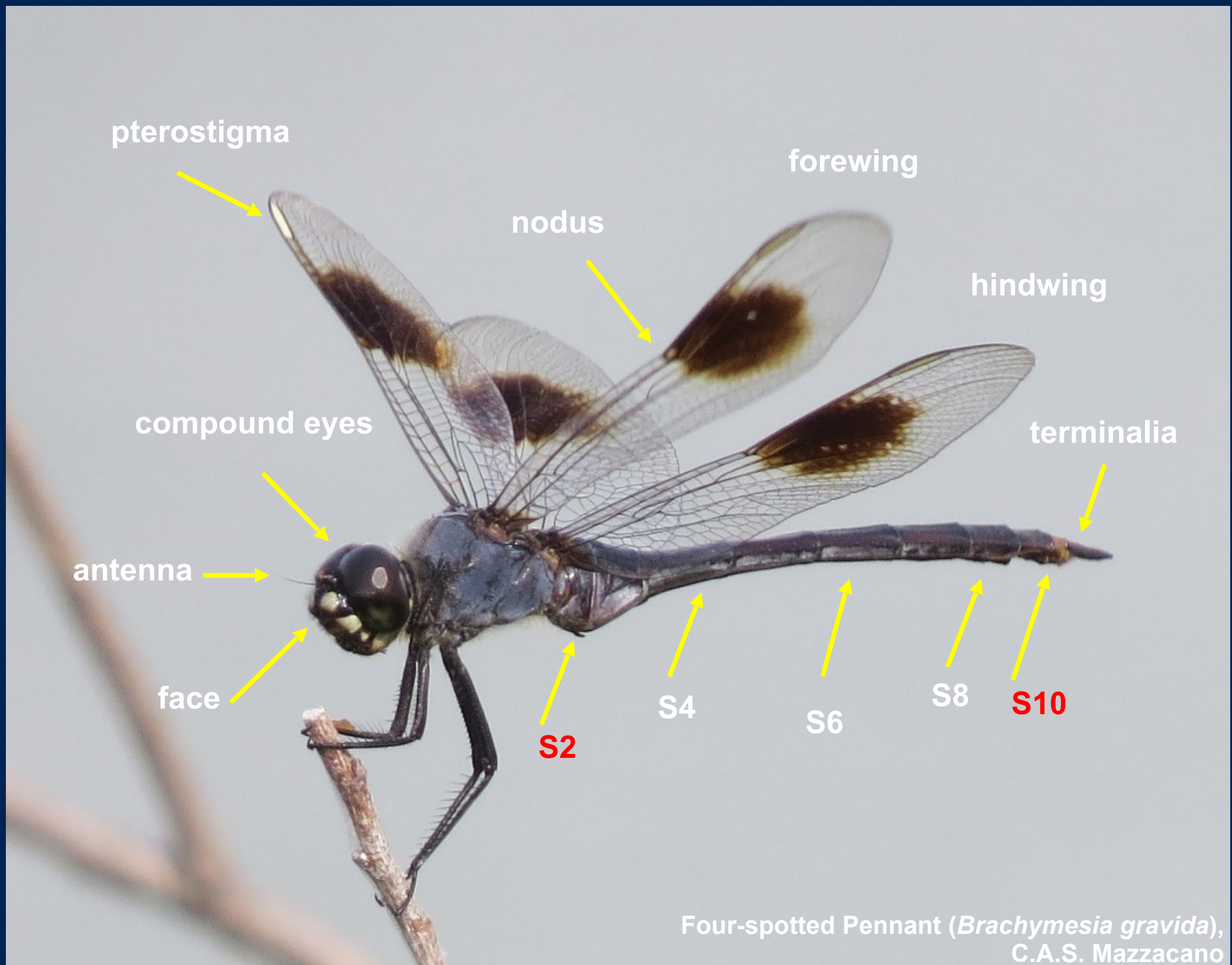
# Odonate Identification



Four-spotted Pennant (*Brachymesia gravida*);  
C.A.S. Mazzacano

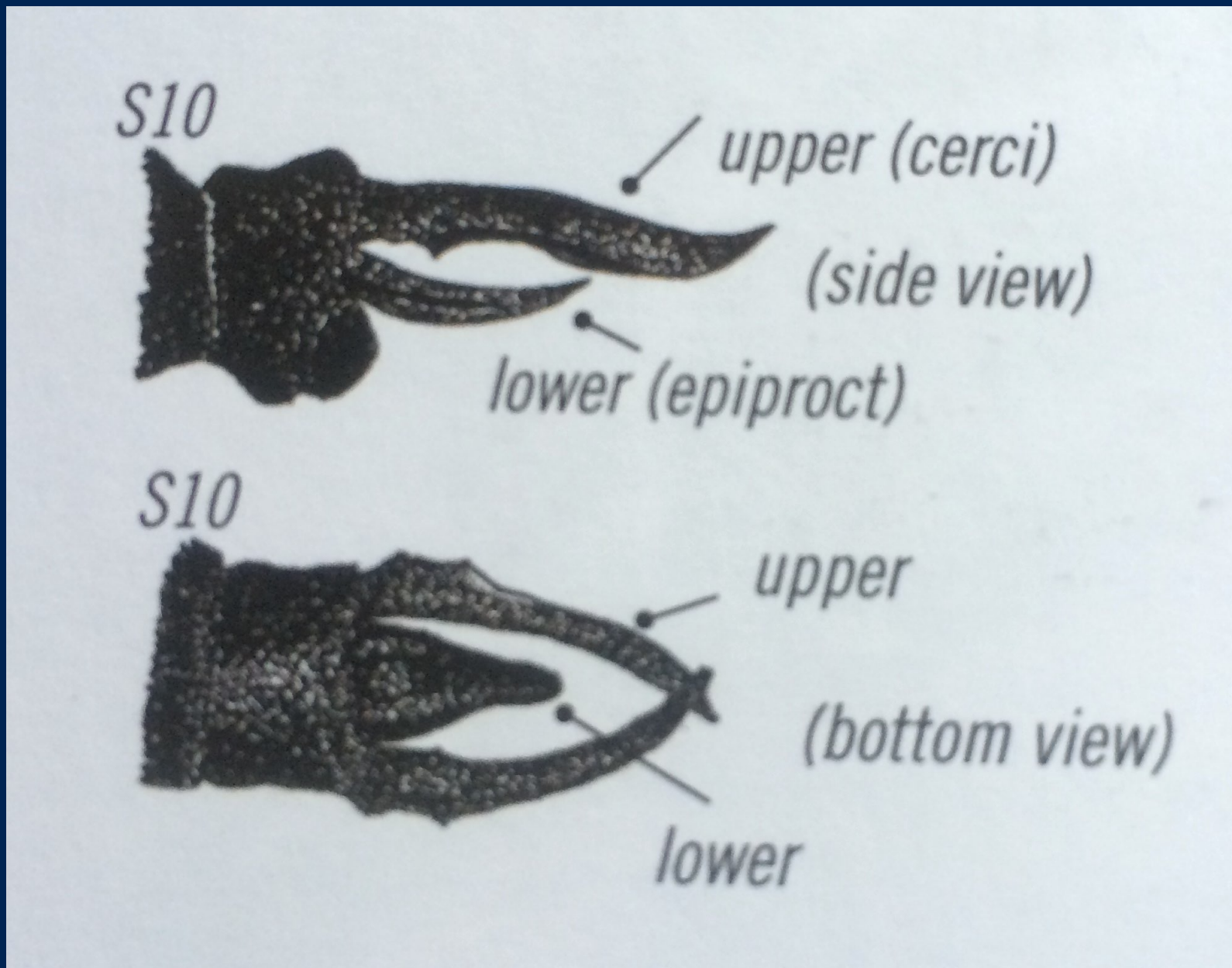


# Odonate Identification





# Odonate Identification

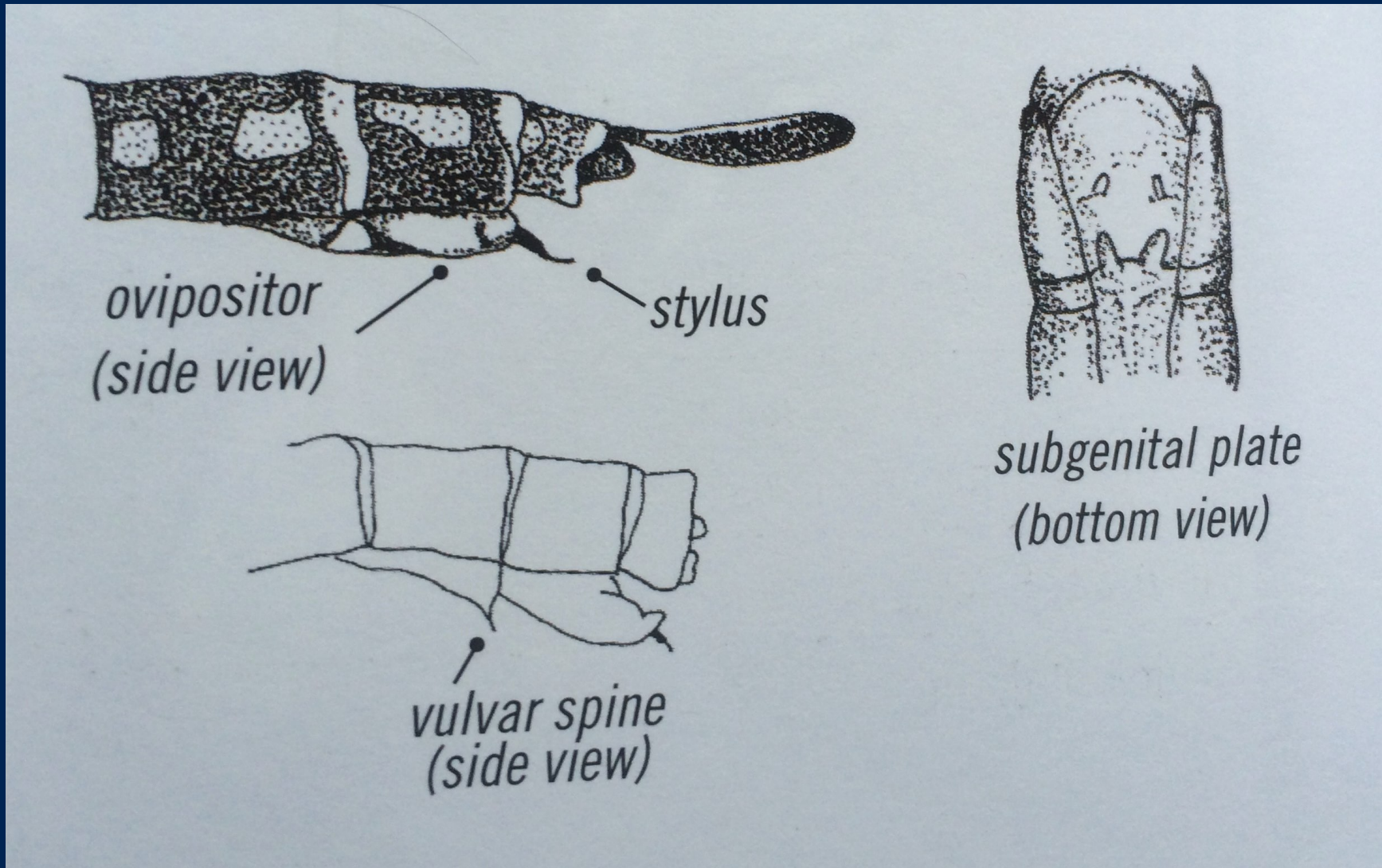


male terminal  
appendages

Dragonflies & Damselflies of Oregon; Cary Kerst & Steve Gordon



# Odonate Identification



female  
terminal  
appendages

Dragonflies & Damselflies of Oregon; Cary Kerst & Steve Gordon



# Dragonflies: darners, skimmers, emeralds, cruisers, clubtails, spiketails, petaltails



Blue-eyed Darner female;  
C.A.S. Mazzacano



Western River Cruiser male;  
Jim Johnson, iNaturalist



Pale Snaketail male;  
C.A.S. Mazzacano



Chalk-fronted Corporal male;  
C.A.S. Mazzacano



## Darners (Aeshnidae)

Green (*Anax*), Mosaic (*Aeshna*), Neotropical (*Rhionaeschna*)

big; blue, green, brown

large eyes touch  
along long seam



*Aeshna interrupta* (Variable Darner), C.A.S. Mazzacano



*Rhionaeschna multicolor* (Blue-eyed Darner), C.A.S. Mazzacano



# Darners (Aeshnidae)

## Common Green Darner (*Anax junius*)

green thorax, no stripes

blue or brownish abdomen

black “bull’s eye”  
on top of face

migratory



*Anax junius* mating (Common Green Darner), C.A.S. Mazzacano



*Anax junius* (Common Green Darner) laying eggs; C.A.S. Mazzacano



# Darners (Aeshnidae)

## Mosaic Darners (*Aeshna*)

brown with blue/green markings

ID by shape and color of  
thoracic stripes; male cerci;  
abdominal spots



Paddle-tailed Darner (*Aeshna palmata*) male; C.A.S. Mazzacano



*Aeshna interrupta* male (Variable Darner),  
C.A.S. Mazzacano



Shadow Darner (*Aeshna umbrosa*)  
female; C.A.S. Mazzacano



## Darners (Aeshnidae)

### Paddle-tailed Darner (*A. palmata*)

thoracic stripes broad, greenish to blue, straight to slightly wavy

black line on face

blue spots on top of abdomen, including S10; no spots below abdomen

paddle-shaped cerci with spiked tip



Paddle-tailed Darner (*Aeshna palmata*) male; C.A.S. Mazzacano





# Darners (Aeshnidae)

## Variable Darner (*A. interrupta*)

thoracic stripes blue, narrow,  
may be broken/interrupted

blue spots on top of  
abdomen, including S10;  
no spots below abdomen

black line on face

simple cerci



*Aeshna interrupta* male (Variable Darner),  
C.A.S. Mazzacano



*Aeshna interrupta* male (Variable Darner),  
C.A.S. Mazzacano



# Darners (Aeshnidae)

## Shadow Darner (*A. umbrosa*)

thoracic stripes green, narrow,  
rearward extension at the top

small blue spots on top of  
abdomen but not on S10;  
blue spots below abdomen

no black line on face

paddle-shaped cerci with  
spike at lower end



Shadow Darner (*Aeshna umbrosa*) male;  
Dennis Doucet, iNaturalist



Shadow Darner (*Aeshna umbrosa*) female;  
C.A.S. Mazzacano



# Darners (Aeshnidae)

## Neotropical Darners (*Rhionaeschna*)

similar to *Aeshna* but  
eyes bluer, tubercule  
under S1

ID by shape of thoracic  
stripes; male cerci



California Darner (*Rhionaeschna californica*) male;  
Jim Johnson, iNaturalist



Blue-eyed Darner (*Rhionaeschna multicolor*) male;  
C.A.S. Mazzacano



## Darners (Aeshnidae)

Blue-eyed Darner (*R. multicolor*)

sky-blue face & eyes; no black facial line

broad, pale blue, straight thoracic stripes

blue spots on top of abdomen, inc. S10; no spots below abdomen

cerci forked at tips





## Darners (Aeshnidae)

California Darner (*R. californica*)

eyes blue above, brown below

black facial line

thoracic stripes narrow, pale blue, straight, black border; front stripe narrows at top

blue spots on top of abdomen, inc. S10; no spots below abdomen

simple cerci



California Darner (*Rhionaeschna californica*) male;  
Robert, iNaturalist



California Darner (*Rhionaeschna californica*);  
Jim Johnson, iNaturalist



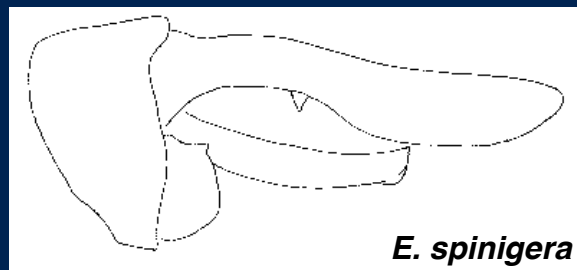
# Emeralds (Corduliidae)

## Spiny Baskettail (*Epitheca spinigera*)

very hairy thorax

dark body, dull yellowish  
markings

distinguish from *E. canis*  
by cerci, T-spot



*E. spinigera*



*E. canis*

Dragonflies & Damselflies of the West, D. Paulson



Spiny Baskettail (*Epitheca spinigera*);  
Jim Johnson, iNaturalist



Beaverpond Baskettail (*Epitheca canis*);  
C.A.S. Mazzacano



# Skimmers (Libellulidae)

King Skimmers (*Libellula*),  
Meadowhawks (*Sympetrum*),  
others

large, sturdy, colorful,  
often with patterned wings

large eyes touch along seam

widespread, common





# Skimmers (Libellulidae)

## King Skimmers (*Libellula*)

patterned wings

males & older females  
develop pruinosity



*Libellula forensis* (Eight-spotted Skimmer), female;  
C.A.S. Mazzacano



*Libellula forensis* (Eight-spotted Skimmer), male;  
C.A.S. Mazzacano



*Libellula forensis* (Eight-spotted Skimmer), male;  
C.A.S. Mazzacano



# Skimmers (Libellulidae)

## King Skimmers (*Libellula*)

Twelve-spotted (*L. pulchella*) has 3 black spots on each wing

yellow stripe along side of female abdomen



*Libellula pulchella* (Twelve-spotted Skimmer), male;  
C.A.S. Mazzacano



*Libellula pulchella* (Twelve-spotted Skimmer),  
teneral female; C.A.S. Mazzacano



## Skimmers (Libellulidae)

### King Skimmers (*Libellula*)

Four-spotted Skimmer  
(*L. quadrimaculata*): hairy,  
dull; dark spot at each wing nodus



*Libellula quadrimaculata* (Four-spotted Skimmer), male; C.A.S. Mazzacano

Flame Skimmer (*L. saturata*):  
red-orange; wings  
with orange wash



*Libellula saturata* (Flame Skimmer), male;  
C.A.S. Mazzacano



# Skimmers (Libellulidae)

## King Skimmers (*Libellula*)

Widow Skimmer (*L. luctuosa*): broad black patch along basal portion of all wings

yellow stripe on female  
thorax splits along  
abdomen



*Libellula luctuosa* (Widow Skimmer), male;  
C.A.S. Mazzacano



*Libellula luctuosa* (Widow Skimmer), female;  
C.A.S. Mazzacano



# Skimmers (Libellulidae)

## Common Whitetail (*Plathemis lydia*)



*P. lydia* female has broken  
yellow dashes along abdomen;  
*L. pulchella* has unbroken line





# Skimmers (Libellulidae)

## Meadowhawks (*Sympetrum*)

small, reddish, perchers

ID by patterns on  
thorax & abdomen



Cardinal Meadowhawk male  
(*Sympetrum vittatum*); C.A.S. Mazzacano



Red-veined Meadowhawk imm. male  
(*Sympetrum madidum*); C.A.S. Mazzacano













Autumn Meadowhawk female (*Sympetrum  
vicinum*); Michele Blackburn



Skimmers  
(Libellulidae)

Meadowhawks  
(*Sympetrum*)

Identification Chart N • Meadowhawks, Genus <i>Sympetrum</i>							
Species (size)	Head	Thorax	Wings	Abdomen	Legs		Photo
<b>Black</b> <i>Sympetrum danae</i> Very Short 27-35 mm	All black	Black, may show yellow	Clear	Black	Black		
<b>Variegated</b> <i>S. corruptum</i> Long 40-42 mm	Red face; brown eyes	Faint stripes ending in yellow spots	Red veins on leading edge	White spots bordered in black	Black with brown stripes		
<b>Cardinal</b> <i>S. illotum</i> Medium 37-40 mm	Bright red	Two white or yellow spots	Red in front veins	Bright red, unmarked	Brown		
<b>Striped</b> <i>S. pallipes</i> Medium 32-36 mm	Pale face; red-brown eyes	Two side stripes	Clear	Small black markings on lower sides	Black		
<b>Band-winged</b> <i>S. semicinctum</i> Medium 30-40 mm	Reddish face and eyes	Complex markings	Orange, base to nodus	Black along lower side	Black		

Identification Chart N • Meadowhawks, Genus <i>Sympetrum</i> (continued)							
Species (size)	Head	Thorax	Wings	Abdomen	Legs		Photo
<b>Cherry-faced</b> <i>S. internum</i> Short 31-36 mm	Orange face, brown eyes	Plain	Amber wash at base, orange veins	Black saw-toothed pattern	Black		
<b>White-faced</b> <i>S. obtrusum</i> Short 30-39 mm	White face	Plain	Clear	Black saw-toothed pattern	Black		
<b>Red-veined</b> <i>S. madidum</i> Long 37-45 mm	Red face and eyes	Plain	Red or amber veins on leading edge	Black saw-toothed pattern	Black		
<b>Saffron-winged</b> <i>S. costiferum</i> Medium 31-38 mm	Red-brown face and eyes	Plain	Golden veins on leading edge	Black on lower sides	Black, brown stripes on upper sides		
<b>Autumn</b> <i>S. vicinum</i> Short 31-37 mm	Red-brown face and eyes	Plain	Clear	Small, thin abdomen	Brown		

Dragonflies & Damselflies of Oregon;  
Cary Kerst & Steve Gordon



Skimmers (Libellulidae)

Meadowhawks (*Sympetrum*)



Cherry-faced Meadowhawk imm. male (*Sympetrum internum*); C.A.S. Mazzacano



Black Meadowhawk female (*Sympetrum danae*); C.A.S. Mazzacano



Striped Meadowhawk male (*Sympetrum pallipes*); C.A.S. Mazzacano



## Skimmers (Libellulidae)

Variegated Meadowhawk (*S. corruptum*) is migratory



Variegated Meadowhawk male (*Sympetrum corruptum*); C.A.S. Mazzacano



Variegated Meadowhawk male (*Sympetrum corruptum*); C.A.S. Mazzacano



Variegated Meadowhawk female (*Sympetrum corruptum*); C.A.S. Mazzacano



# Skimmers (Libellulidae)



Blue Dasher female (*Pachydiplax longipennis*); C.A.S. Mazzacano



Blue Dasher male (*Pachydiplax longipennis*); C.A.S. Mazzacano



Western Pondhawk female (*Erythemis collocata*); C.A.S. Mazzacano



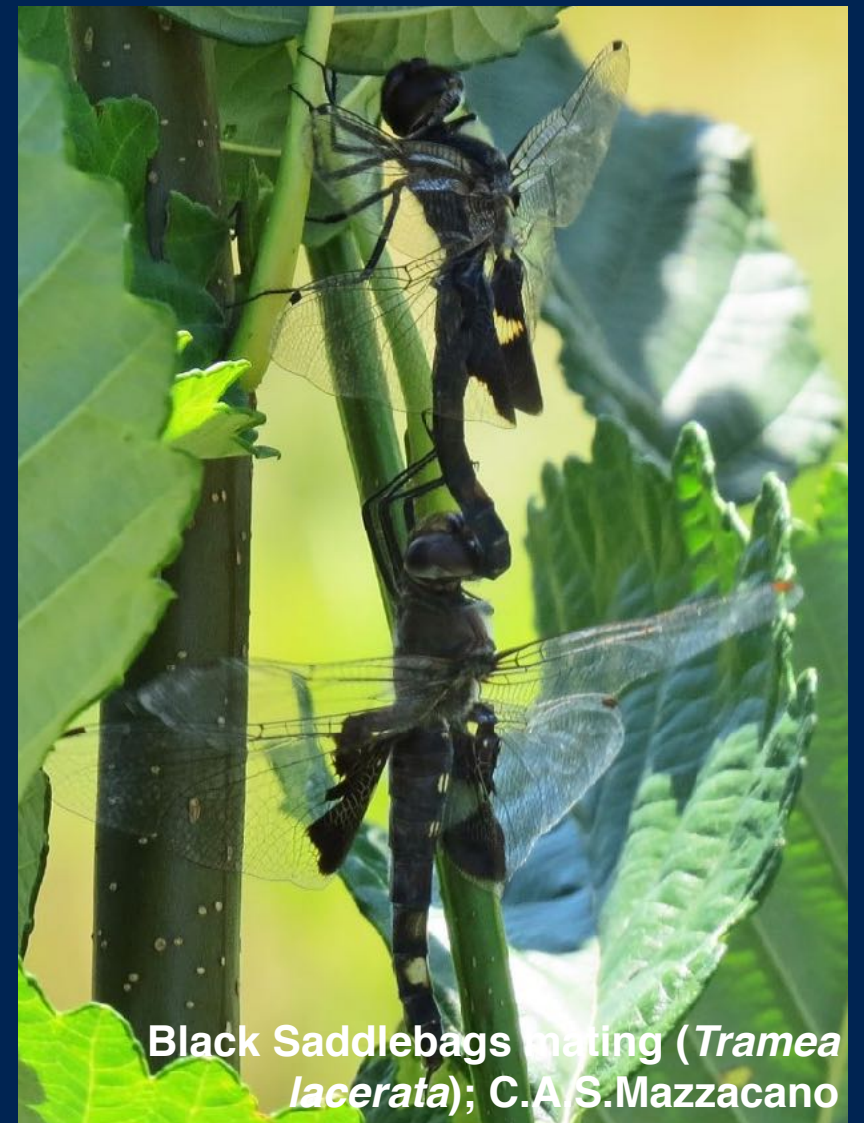
Western Pondhawk male (*Erythemis collocata*); C.A.S. Mazzacano

male Blue Dashers have  
green eyes & white face



# Skimmers (Libellulidae)

Black Saddlebags (*Tramea lacerata*), Wandering Glider (*Pantala flavescens*), Spot-winged Glider (*P. hymenaea*) are migratory



Black Saddlebags mating (*Tramea lacerata*); C.A.S. Mazzacano



Spot-winged Glider (*Pantala hymenaea*);  
Eric Isley, iNaturalist



Wandering Glider (*Pantala flavescens*);  
C.A.S. Mazzacano



## Cruisers (Macromiidae)

### Western River Cruiser (*Macromia magnifica*)

large; dark & yellow

long banded abdomen,  
side stripe on thorax

pearly gray eyes touch  
at seam on top of head



Western River Cruiser; Jim Johnson, iNaturalist



## Clubtails (Gomphidae)

### Olive Clubtail (*Stylurus olivaceus*)

eyes small, blue, separated

olive face & thorax

dark shoulder stripe

flared dark abdomen;  
pale green “arrows”  
pointed towards tip



Olive Clubtail; Jim Johnson, iNaturalist



# Damselflies: broad-winged, spreadwings, pond damsels



California Spreadwing (*Archilestes californica*) male; C.A.S. Mazzacano



River Jewelwing male (*Calopteryx aequabilis*)



Tule Bluet (*Enallagma carunculatum*) male; C.A.S. Mazzacano



# Spreadwings (Lestidae)

wings spread when perched

large; long leg spines

males pruinose

metallic above (*Lestes*)



California Spreadwing female  
(*Archilestes californica*); C.A.S. Mazzacano



Spotted Spreadwing female (*Lestes congener*);  
C.A.S. Mazzacano



California Spreadwing male  
(*Archilestes californica*); C.A.S. Mazzacano



# Spreadwings (Lestidae)

ID *Lestes* based on  
appendages, pruinosity

Emerald Spreadwing  
(*L. dryas*)

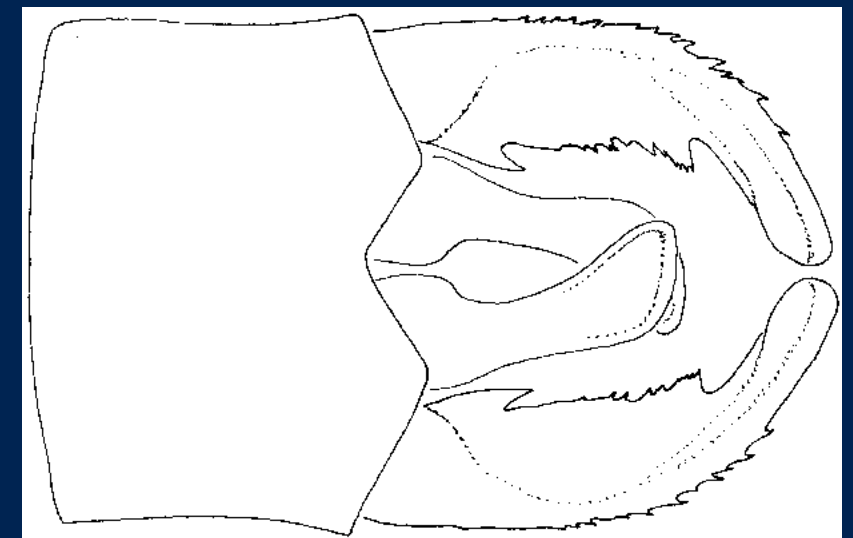
thorax metallic green above

stocky body

tips of medium-long  
paraprocts point inwards



Emerald Spreadwing male  
(*Lestes dryas*);  
C.A.S. Mazzacano



Dragonflies & Damselflies of the West,  
Dennis Paulson



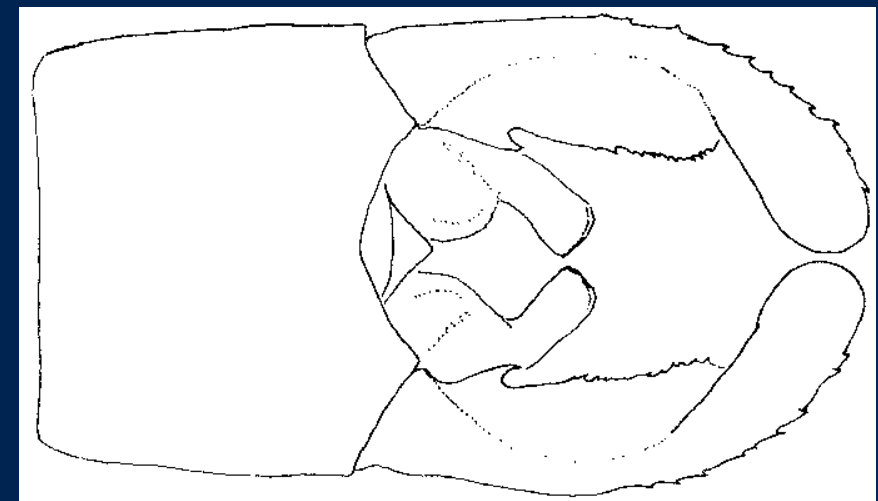
# Spreadwings (Lestidae)

## Spotted Spreadwing (*L. congener*)

thorax brown & white

small dark spots under  
thorax

short paraprocts



Dragonflies & Damselflies of the West,  
Dennis Paulson



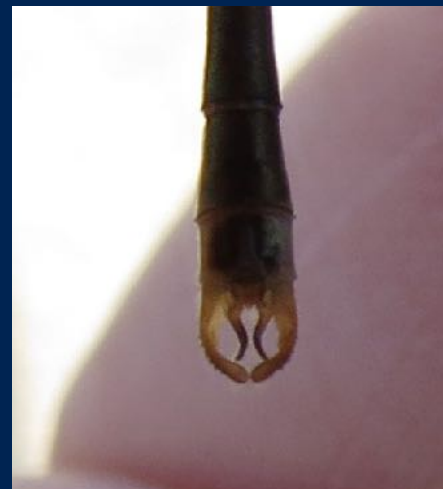
# Spreadwings (Lestidae)

## Lyre-tipped Spreadwing (*L. unguiculatus*)

thorax with blue stripes,  
pruinose

bi-colored stigmas

lyre-shaped paraprocts





# Pond Damselfs (Coenagrionidae)

## Dancers (*Argia*)

blue, lavender, black

bouncy flight

perch with wings  
above abdomen

long leg spines



Vivid Dancer female  
(*Argia vivida*); C.A.S. Mazzacano



Vivid Dancer male  
(*Argia vivida*); C.A.S. Mazzacano



# Pond Damselfs (Coenagrionidae)

## Bluets (*Enallagma*)

blue & black

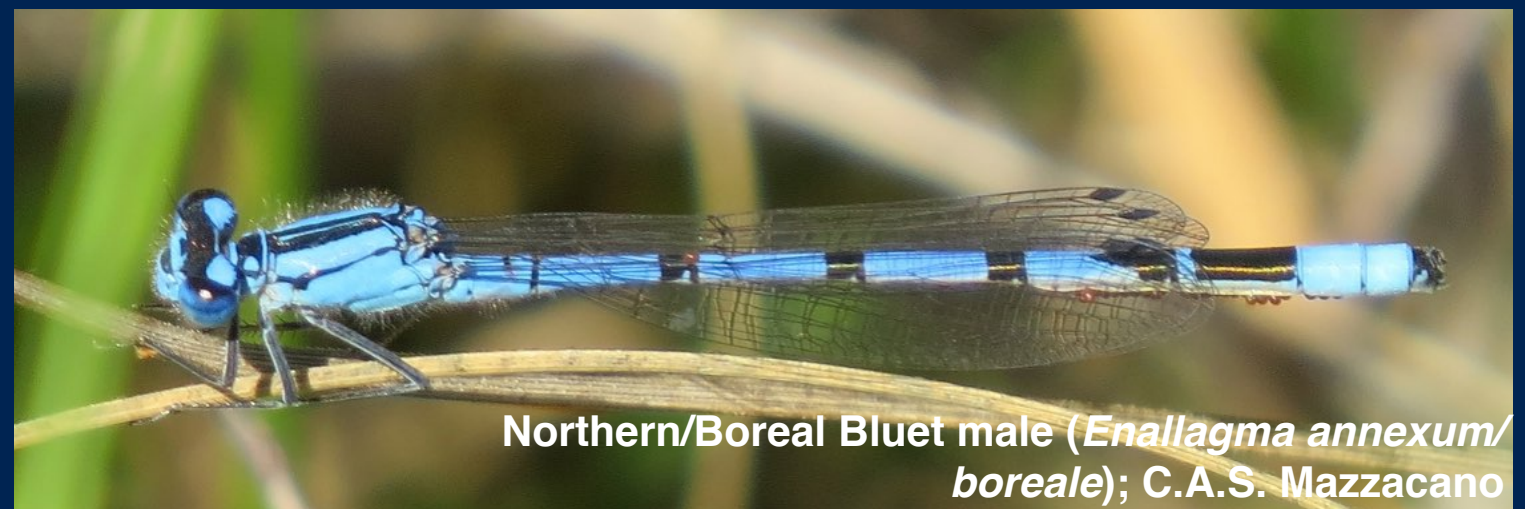
S10 black on top

perch with wings along abdomen

shorter leg spines



Tule Bluets (*Enallagma carunculatum*);  
C.A.S. Mazzacano



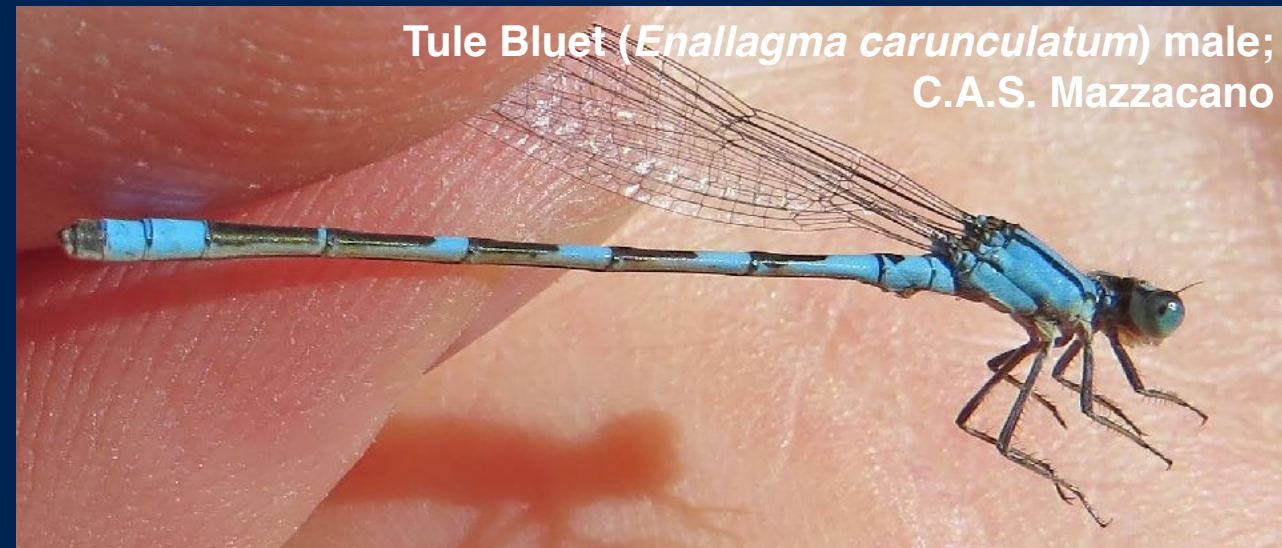
Northern/Boreal Bluete male (*Enallagma annexum/boreale*); C.A.S. Mazzacano



# Pond Damselfs (Coenagrionidae)

## Bluets (*Enallagma*)

Tule Bluet (*E. carunculatum*):  
male abdomen more black  
than blue; tubercle at end of  
male cerci



Tule Bluet (*Enallagma carunculatum*) male;  
C.A.S. Mazzacano

Northern/Boreal Bluet (*E. annexum/boreale*):  
male abdomen more  
blue than black



Northern Bluet male (*Enallagma annexum*); C.A.S. Mazzacano



# Pond Damselfs (Coenagrionidae)

## Forktails (*Ischnura*)

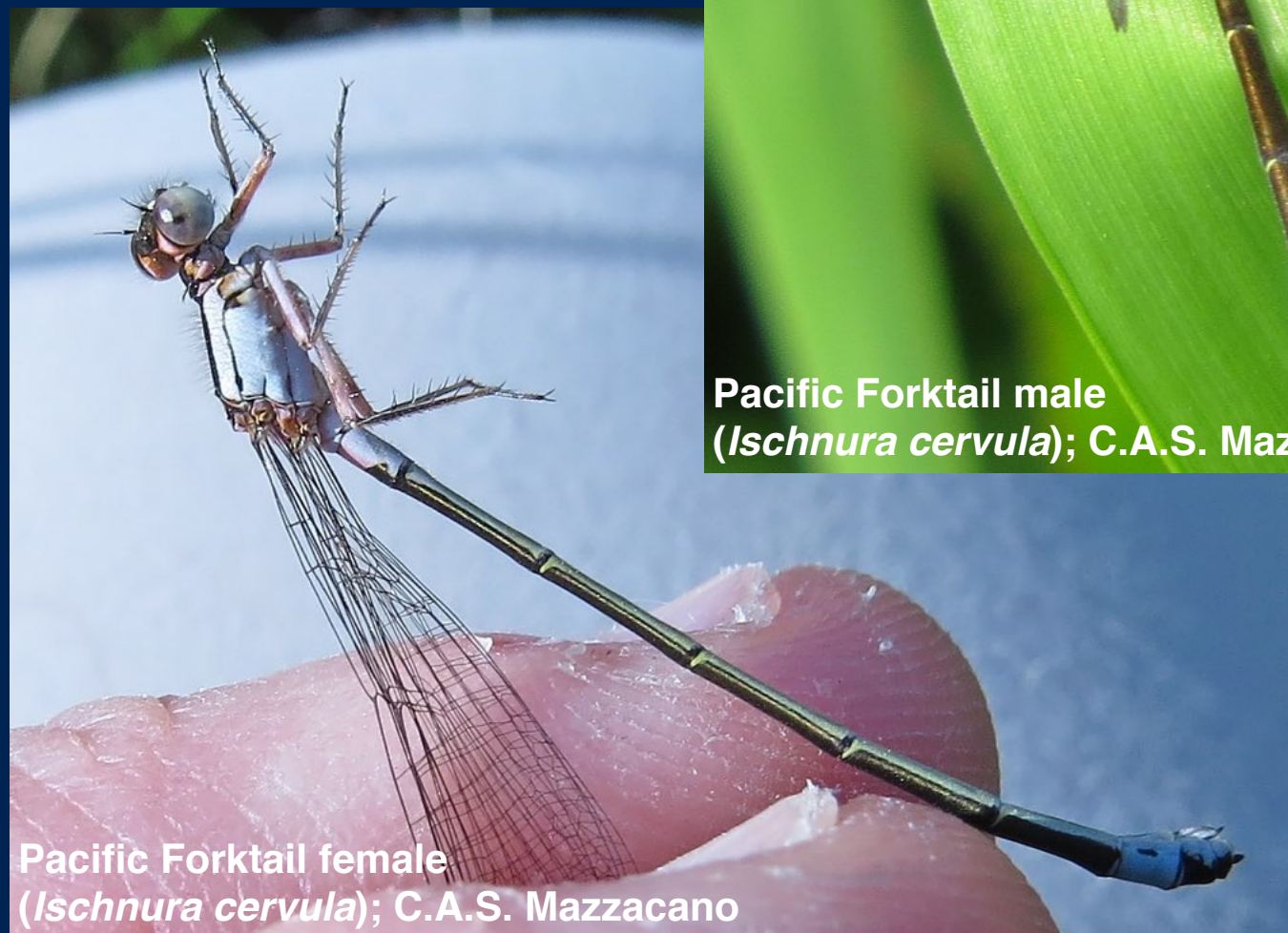
thorax green or blue

male abdomen  
black with blue tip

S10 has forked  
projection



Pacific Forktail male  
(*Ischnura cervula*); C.A.S. Mazzacano



Pacific Forktail female  
(*Ischnura cervula*); C.A.S. Mazzacano



# Pond Damselfs (Coenagrionidae)

Pacific Forktail (*I. cervula*):

4 blue dots on top of male thorax

female thorax pink/blue when young,  
becomes dull/dusky with age



Pacific Forktail male  
*Ischnura cervula*;  
C.A.S. Mazzacano



Pacific Forktail female  
*(Ischnura cervula)*; C.A.S. Mazzacano



# Pond Damselfs (Coenagrionidae)

Western Forktail (*I. perparva*):

small; short wings

male thorax green-striped

young females orange,  
pruinose when mature



Western Forktail male (*Ischnura perparva*); Bob Danley, iNaturalist



Western Forktail female (*Ischnura perparva*); Allison Sheehey, iNaturalist



# Pond Damselfs (Coenagrionidae)

## Red Damselfs (*Amphiagrion*)

small; short abdomen

males red with black;  
females orange



Western Red Damself male (*Amphiagrion abbreviatum*); Scott Mlodinow, iNaturalist



Western Red Damself female (*Amphiagrion abbreviatum*); Jim Johnson, iNaturalist



# Broad-winged Damselfs (Calopterygidae)

## River Jewelwing (*Calopteryx aequabilis*)

broad, colored wings

wings not stalked,  
may lack stigma

metallic body





# Monitoring Protocol

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## DRAGONFLY & DAMSELFLY MONITORING

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Protocol for Community-based Surveys



Common Green Darner pair (*Anax junius*) laying eggs. Photo by Celeste Searles Mazzacano.

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# Monitoring Protocol

## Timing

once every 10-14 days  
during flight season

plan schedule  
with team





# Monitoring Protocol

When should you survey?

Time range	10:00 am - 4:00 pm			9:30 am - 4:30 pm	
Temperature	< 59°F (15°C)	59-65°F (15-18°C)	65-75°F (18-24°C)	>75°F (24°C)	>88°F (31°C)
Cloud cover >60%	No	No	Yes	Yes	No
Cloud cover <60%	No	Yes	Yes	Yes	No
Windy (small tree branches swaying)	No	No	No	No	No
Rain	No	No	No	No	No



# Monitoring Protocol

What do you need?

water, snacks, hat, sunscreen

footwear that can get wet/muddy

data sheet or field notebook

binoculars and/or hand lens

aerial net

camera

**This level of dedication is not required!**



C.A.S. Mazzacano



# Monitoring Protocol

Safety considerations

don't work alone

look before you step (nutria holes,  
deep mud, downed logs, trash,  
wasp nests, etc.)

stay hydrated





Walk slow transect looking over  
water and in vegetation

perched, flying, mating,  
emerging, ovipositing adults





stop and do visual scan  
at intervals

try to avoid double-counting

record abundance & behaviors  
on data sheet

designated team member will  
enter all records into iNaturalist  
project





## JCWC Dragonfly and Damselfly Community-based Monitoring Project Data Sheet

DATE \_\_\_\_\_ SITE NAME \_\_\_\_\_ START TIME \_\_\_\_\_ END TIME \_\_\_\_\_

OBSERVER NAME(S) \_\_\_\_\_

WEATHER: Temperature \_\_\_\_\_ °C / °F Wind (calm, light, moderate, strong) % cloud cover \_\_\_\_\_

NOTES \_\_\_\_\_

Species List: Record the species observed; circle 'M' and/or 'F' to indicate whether males or females were seen. Record abundance category and all ID methods and reproductive stages observed using the appropriate letter codes.

**Identification method**  
(record all that apply)

**V** (visual)  
**C** (captured)  
**P** (photograph)

**Abundance category**

**N** (none, 0)  
**U** (uncommon, 1-4)  
**F** (frequent, 5-20)  
**C** (common, 21-100)  
**A** (abundant, >100)

**Reproductive stage**  
(record all that apply)

**W** (wheel)  
**TP** (tandem pair)  
**O** (ovipositing)  
**TA** (teneral adult)

Species Name	ID Method	Abundance	Reproductive stages
	M F		
	M F		
	M F		
	M F		
	M F		
	M F		
	M F		
	M F		
	M F		
	M F		
	M F		
	M F		

Basic information:  
  
date, site, start and end time, observers  
  
weather conditions  
  
relevant notes



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	M F		
	M F		
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	M F		
	M F		
	M F		
	M F		
	M F		
	M F		

record each species seen

indicate if males (M) and/or females (F) were present in each species seen



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	M F		
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	M F		
	M F		
	M F		
	M F		
	M F		
	M F		

ID method:

V (visual) = sight record only

C (captured) = netted and observed in-hand

P (photo) = took photo; preferred for confirmation!



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	M F		
	M F		
	M F		
	M F		
	M F		
	M F		
	M F		
	M F		
	M F		
	M F		

Abundance (ranges):

N (none)

U (uncommon) = 1-4 individuals seen

F (frequent) = 5-20

C (common) = 21-100

A (abundant) = >100



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OBSERVER NAME(S) \_\_\_\_\_

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	M F		
	M F		
	M F		
	M F		
	M F		
	M F		

Reproductive stages:

W (wheel) = mating

TP (tandem pair) = male still holding female

O (ovipositing) = laying eggs

TA (teneral adult) = newly-emerged



# Record data on iNaturalist project site

[« Projects](#)

[Terms & Rules](#) | [Leave this project](#)



## Dragonfly Surveys in Johnson Creek Watershed

[Add observations to this project](#)

### Event Stats

#### Totals

205

Observations »

23

Species »

9

People »

#### Most Observations



celeste2

53 observations



jimk

49 observations



naturalist619

41 observations



ddeck

26 observations



forcreeks

12 observations

#### Most Species



naturalist619

18 species



ddeck

18 species



celeste2

16 species



jimk

14 species



forcreeks

12 species

#### Most Observed Species



Pacific Forktail

19 observations



Tule Bluet

19 observations



Blue-eyed Darner

17 observations



Common Green Darner

14 observations



Cardinal Meadowhawk

13 observations

<http://www.inaturalist.org/projects/dragonfly-surveys-in-johnson-creek-watershed>



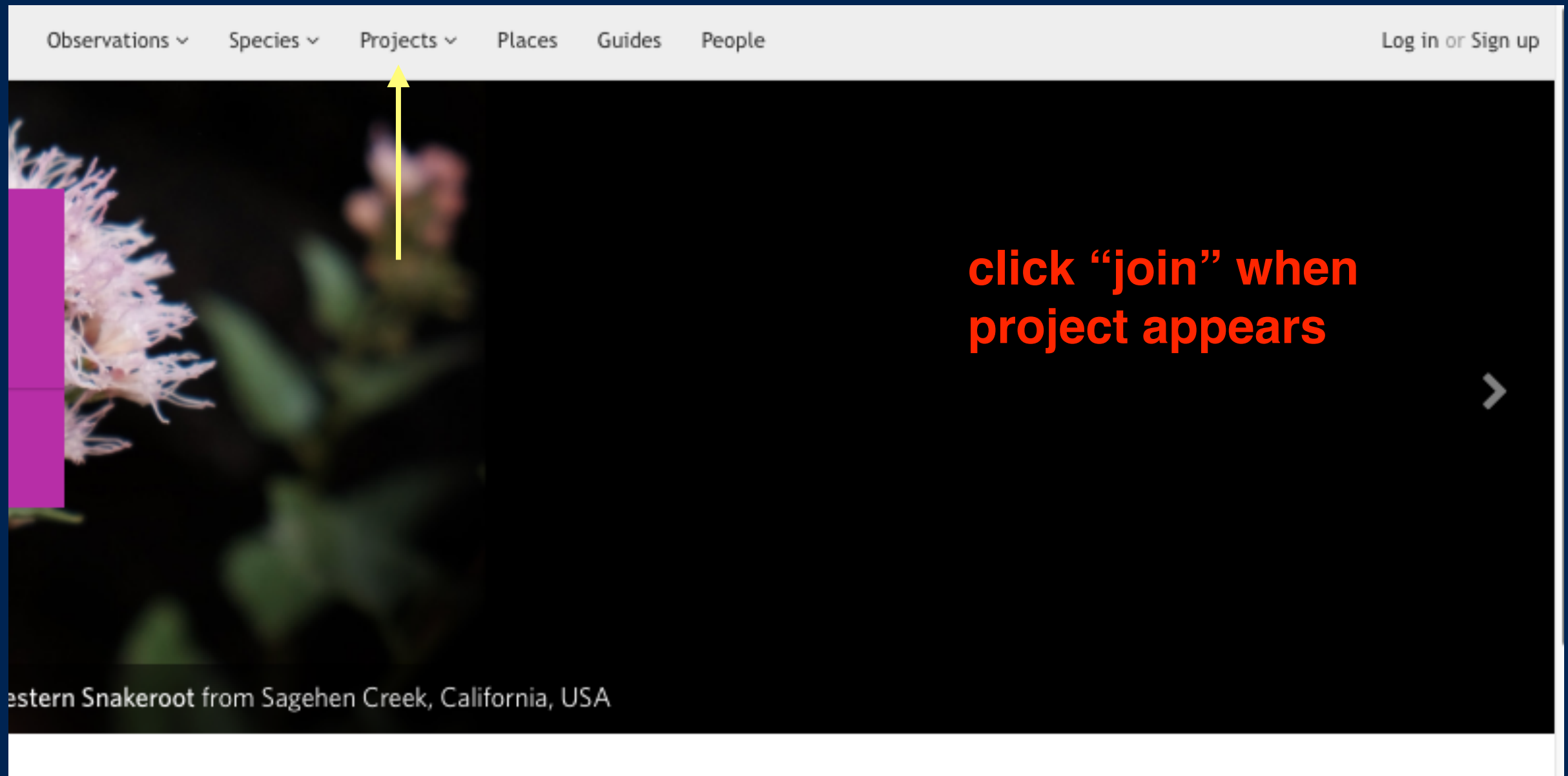
# How to use iNaturalist

go to [www.inaturalist.org](http://www.inaturalist.org) & register as a new user

The screenshot shows the iNaturalist.org homepage. At the top is a navigation bar with links for Observations, Species, Projects, Places, Guides, and People, along with a 'Log in or Sign up' link. A large banner features a pink box with a tree icon and the text '109,897 Species Observed', with 'SIGN UP' and 'LEARN' buttons below it. A yellow arrow points to the 'Log in or Sign up' link. Below the banner is a user profile for 'Faerthen Felix' with a photo and the text 'Western Snakeroot from Sagehen Creek, California, USA'. The 'How It Works' section follows, consisting of three numbered steps: 1. Record your observations (showing a smartphone with a caterpillar), 2. Share with fellow naturalists (showing three people icons), and 3. Discuss your findings (showing a butterfly icon and speech bubbles).



click on “Projects” dropdown & type “dragonfly surveys in Johnson Creek” into search box





# Join and Add an observation to Dragonfly Surveys in J...



Add: [Batch](#) · [From list](#) · [Import](#) · [From photos](#)

What did you see?

☐ ID Please?

Where were you?



westmoreland park, portland or



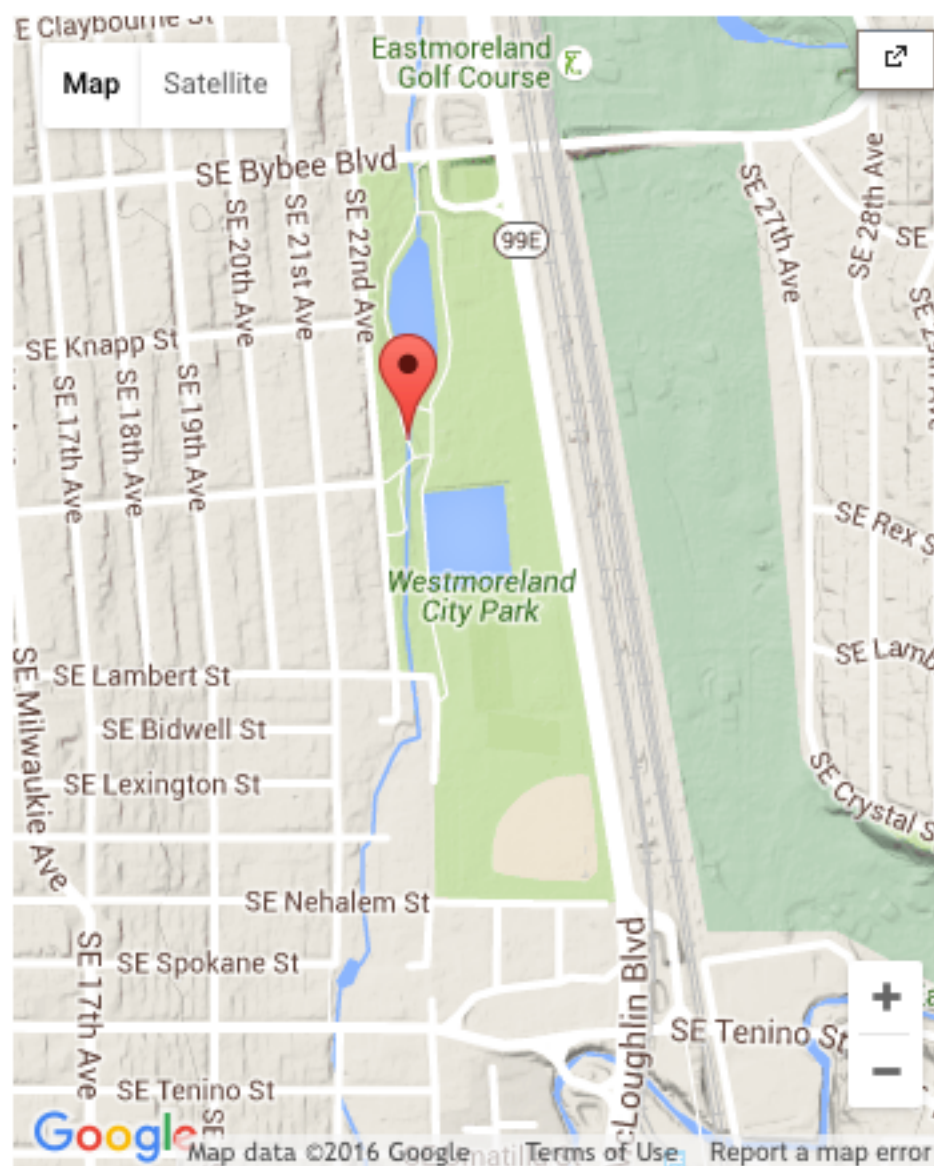
Lat: 45.470925

Lon: -122.641905

[Edit](#)

Acc (m):

Src: manual



Add media

Add photos

Add sounds

Source: your hard drive

Select one or more photos

Choose Files no files selected

☐ Sync obs. w/ photo metadata?

[clear](#)

When did you see it?



(GMT-08:00) Pacific Time (US & Ca)

e.g. "2016-06-13 10:47:43", yesterday at 4pm

Description

enter common or  
scientific name  
(drop-down will  
appear) & date

enter location, select  
“search”, and map will  
zoom to location —>  
can also move point  
manually

select photo files to  
upload

Tags Comma-separated, please

Change geoprivacy

open



additional data  
fields identical to  
project data sheet

can enter multiple  
different species  
observations for  
same location &  
date using “save  
and add another”  
button

Fields for Dragonfly Surveys in Johnson Creek Watershed ⓘ

Observer(s) Name(s)

Site Name   
*Name of your site*

Start time

End time

Temperature (F)   
*Enter the average temperature at the time of your observation. Make your best guess if you do not know the exact temperature.*

Wind movement

Cloud Cover (%)   
*Enter the average percent cloud cover (to the best of your ability) at the time of the observation.*

Notes

Species Name   
*If you know it, please enter it.*

Sex Class   
*Sex of individual if known*

ID Method   
*Record all that apply: V (visual), C (captured), P (photograph)*

Abundance Category

Reproductive Stage   
*Record all that apply: W (wheel), TP (tandem pair), O (ovipositing), TA (teneral adult)*

More fields ⓘ

Add a field  [Create a new field](#) [View all fields](#)

[Save observation](#) [Save and add another](#) [Cancel](#)



Not sure about ID? iNaturalist crowd-sourcing lets other users confirm or correct

« Your observations Previous

**Common Whitetail** (*Plathemis lydia*) · Observed by celeste2 · June 12, 2016

Edit Copy Delete Add to favorites Identify Add to project Share









Photo © Celeste Mazzacano, some rights reserved Add more photos

Location: Fern Hill, forest grove OR (Google, OSM)  
Places: Washington, US-OR, US, North America, NA More...  
Lat 45.493577, Lon -123.091827  
Accuracy: 3321m  
Geoprivacy: open Edit Hide details

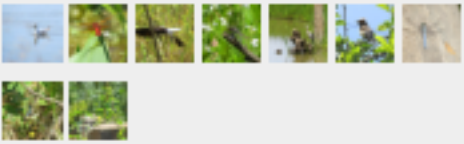
Added: Jun. 14, 2016 08:55:03 -0700  
Add/edit more fields

### Comments & Identifications

 Your ID: **Common Whitetail** (*Plathemis lydia*) Remove  
Posted by you about 2 hours ago

 aguilita's ID: **Common Whitetail** (*Plathemis lydia*)  
Posted by aguilita about 2 hours ago


Add a comment Add an identification



View 9 from June 12, 2016 »

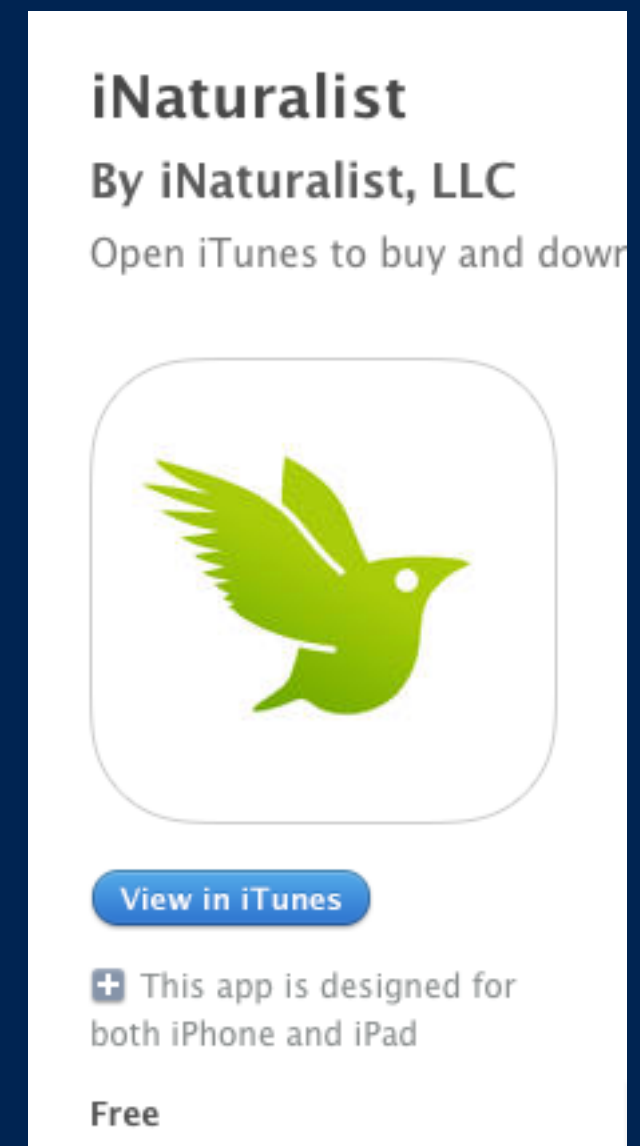
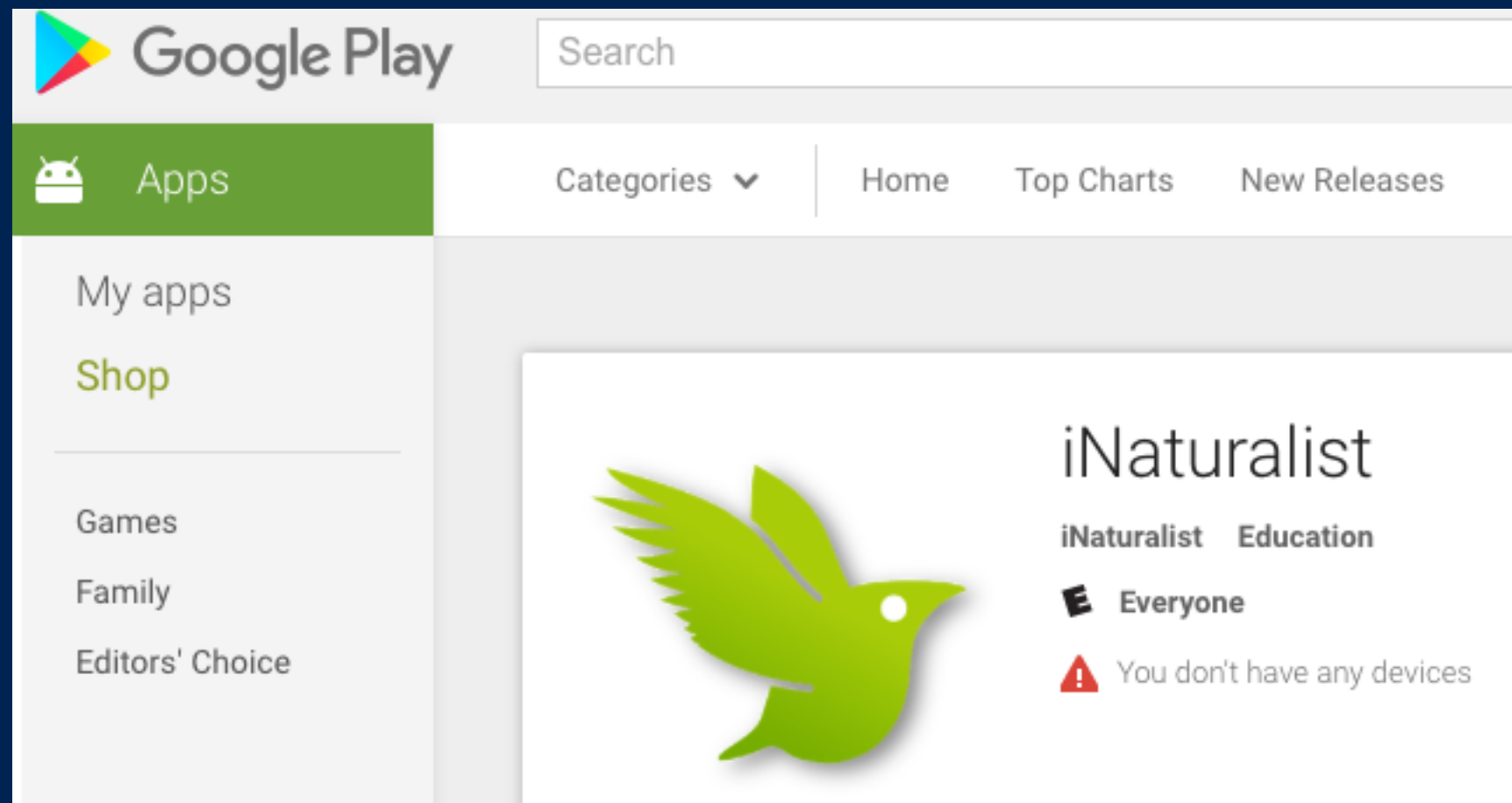
### Data Quality Assessment

Quality grade: **Research** Details

Observation © Celeste Mazzacano  
 some rights reserved Edit



can download free iNaturalist app for iOS or Android  
log in to app & add JCWC Dragonfly Survey Project  
can upload photos and report observations in the field







C.A.S. Mazzacano



C.A.S. Mazzacano

Have fun & learn!



C.A.S. Mazzacano



Judy Adler



# Questions?

Celeste A. Searles Mazzacano  
[cmazzacano@gmail.com](mailto:cmazzacano@gmail.com)



Striped Meadowhawk (*Sympetrum pallipes*); CASM



Common Whitetail (*Plathemis lydia*); CASM



Western Pondhawk (*Erythemis collocata*); CASM