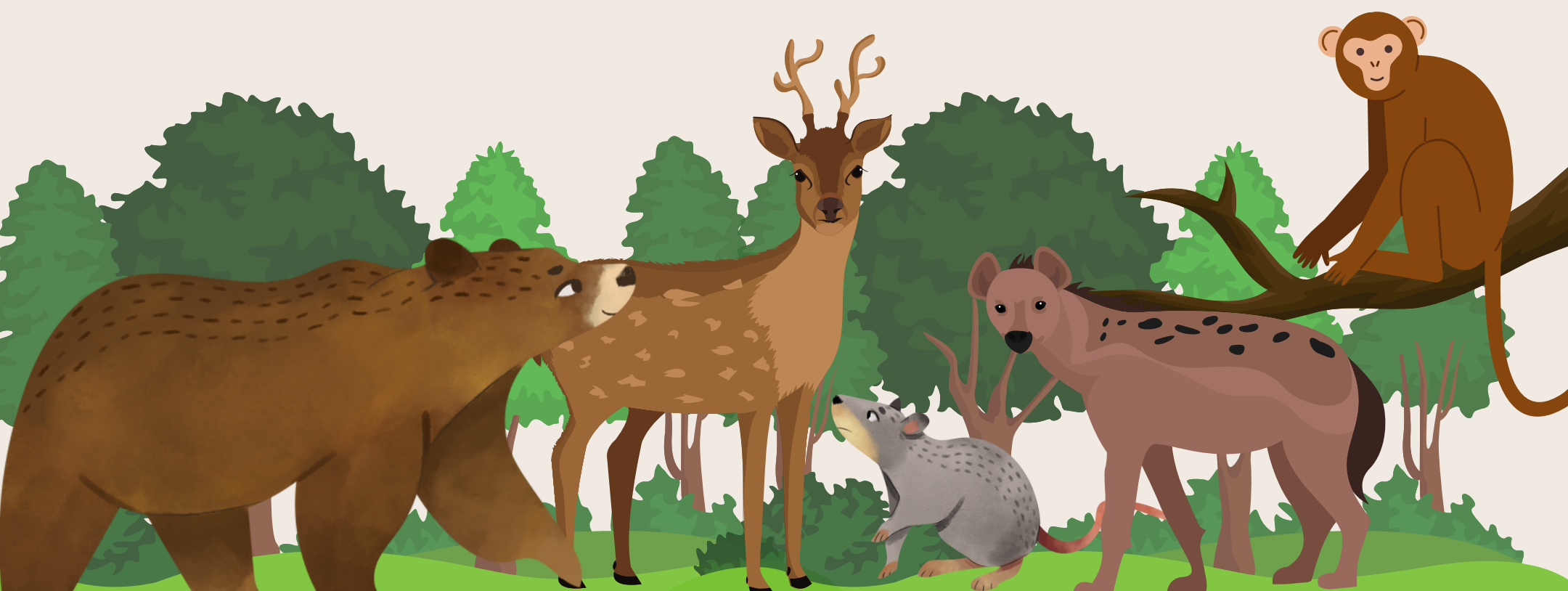




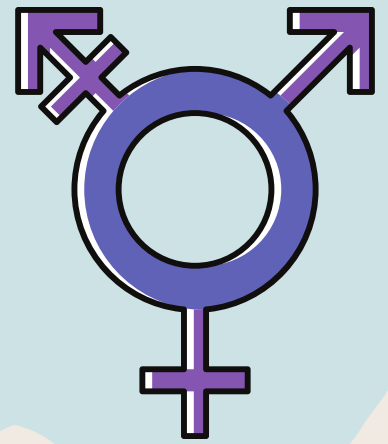
SEX DIVERSITY IN NATURE.

A brief exploration of sex diversity in the natural world.*

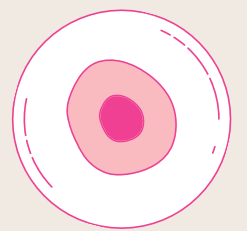
*Roughgarden, J. (2013). Evolution's rainbow: Diversity, gender, and sexuality in nature and people. Univ of California Press.



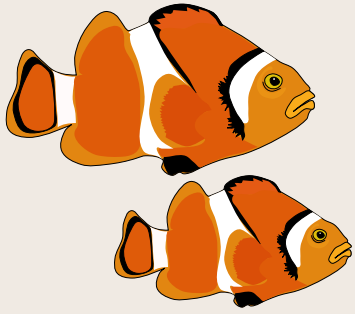
WHAT IS BIOLOGICAL SEX?



- In biology, male and female are minor and often inconsequential categories.
 - The definition of a male is something that produces small gametes.
 - The definition of a female is something that produces large gametes.*
- That's it! All other behavior and anatomy is not necessarily correlated to biological sex.



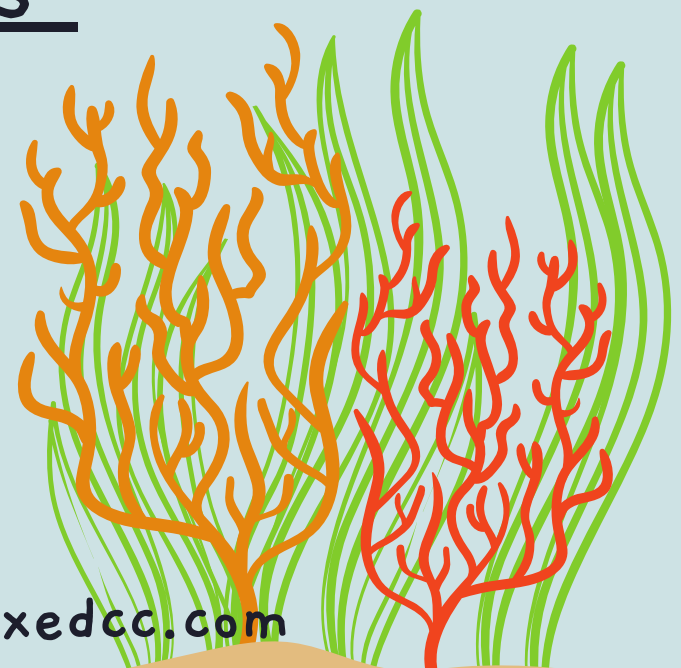
* Gametes are reproductive cells that contain genetic material.

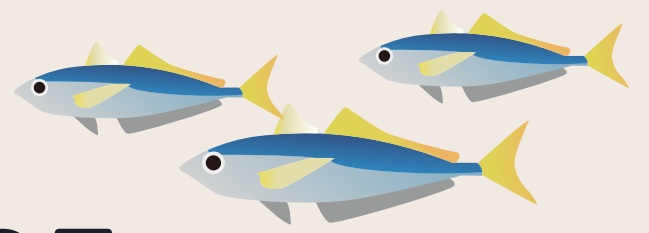


CLOWNFISH

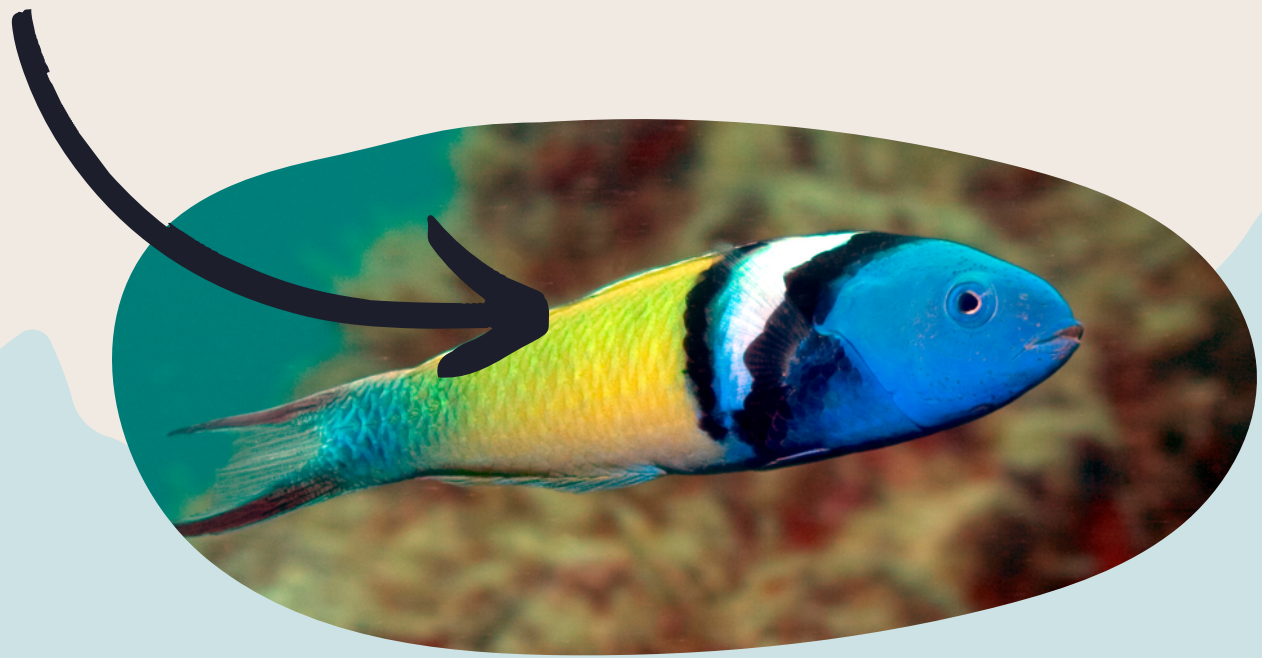


- Clownfish can switch between being male or female
- if a female clownfish is removed from a sea anemone, a male clownfish will turn into a female and begin producing eggs





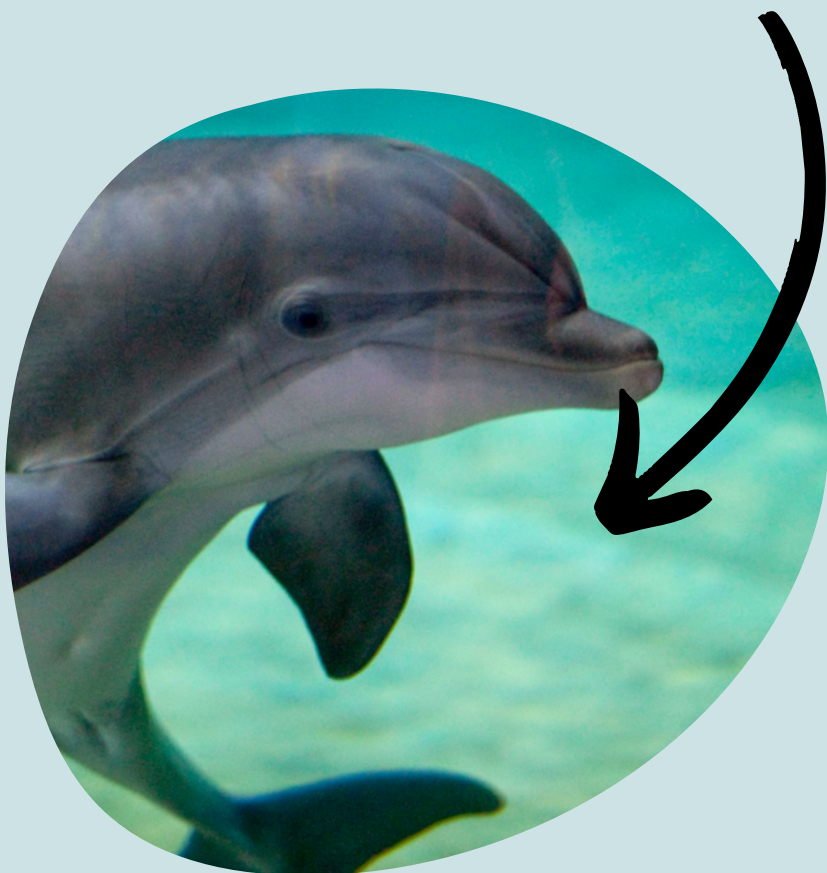
BLUEHEAD WRASSE



- Bluehead wrasse have three common sexes!
 - males, females, and female- > male
- The female- > males are typically larger, more territorial, and have a better chance at mating with females
- The female - > male fish can begin producing sperm after just 10 days!



MARINE MAMMALS



- Male dolphins and whales have internal genitalia
 - internal testes, no scrotum, and an internal “genital slit.”

GOBIE



- Gobies switch back and forth between sexes!
- 80% of juveniles mature into females, then switch to male at some point in their life, and then switch back.

BEARS



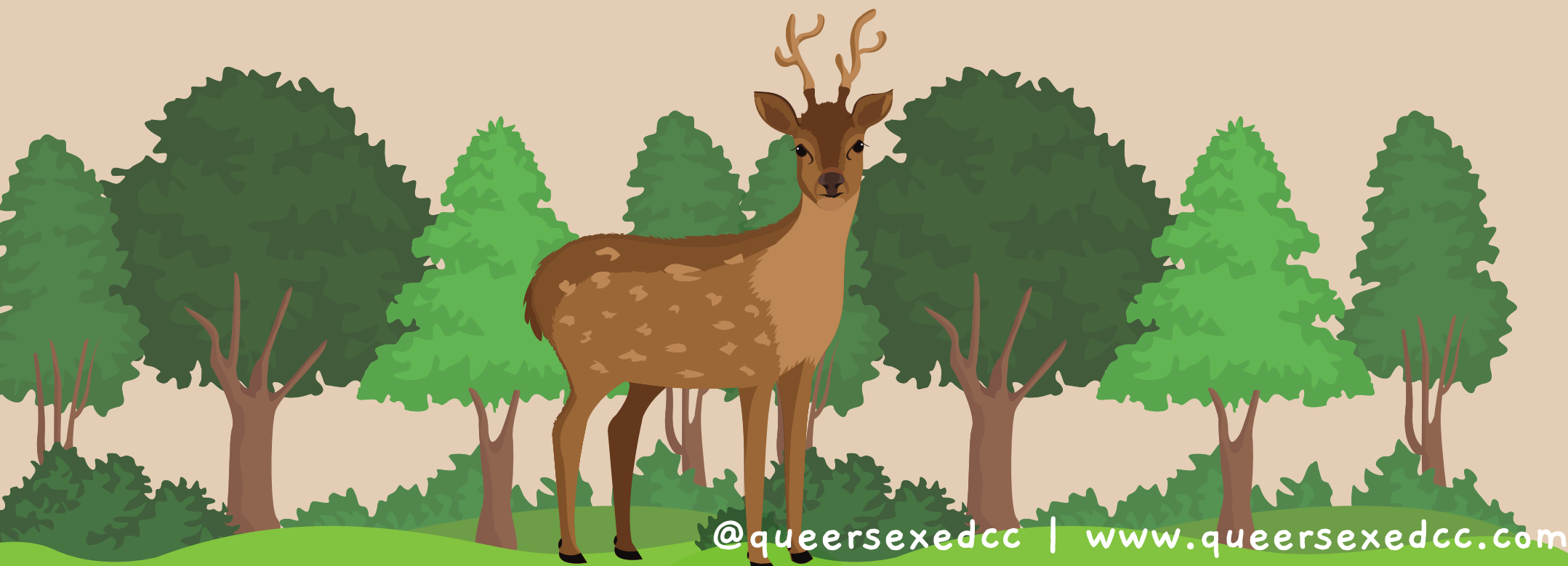
- 10-20% of the female population have external genitalia or a birth canal that runs through a penis
- This can be found in Grizzly bears, American black bears, and polar bears





DEER AND ELK

- Many types of deer have intersex individuals
 - “Velvet horn” males have small antlers, doe-like features, and small testes
- This can be found in white-tailed deer, black-tailed deer, elk, swamp deer, sika deer, roe deer, fallow deer, and moose



KANGAROO RAT



- As many as 16% of kangaroo rats have both sperm and egg-producing abilities.
- Some individual kangaroo rats have a vagina, penis, testes, and uterus all in one!



HYENAS



- Both male and female hyenas have almost identical penises
- Female hyenas give birth through external genitalia



PRIMATES



- Males and females both have external genitalia
 - i.e. a clitoris and penis that look almost indistinguishable
- This can be found in spider monkeys, bushbabies, woolly monkeys

