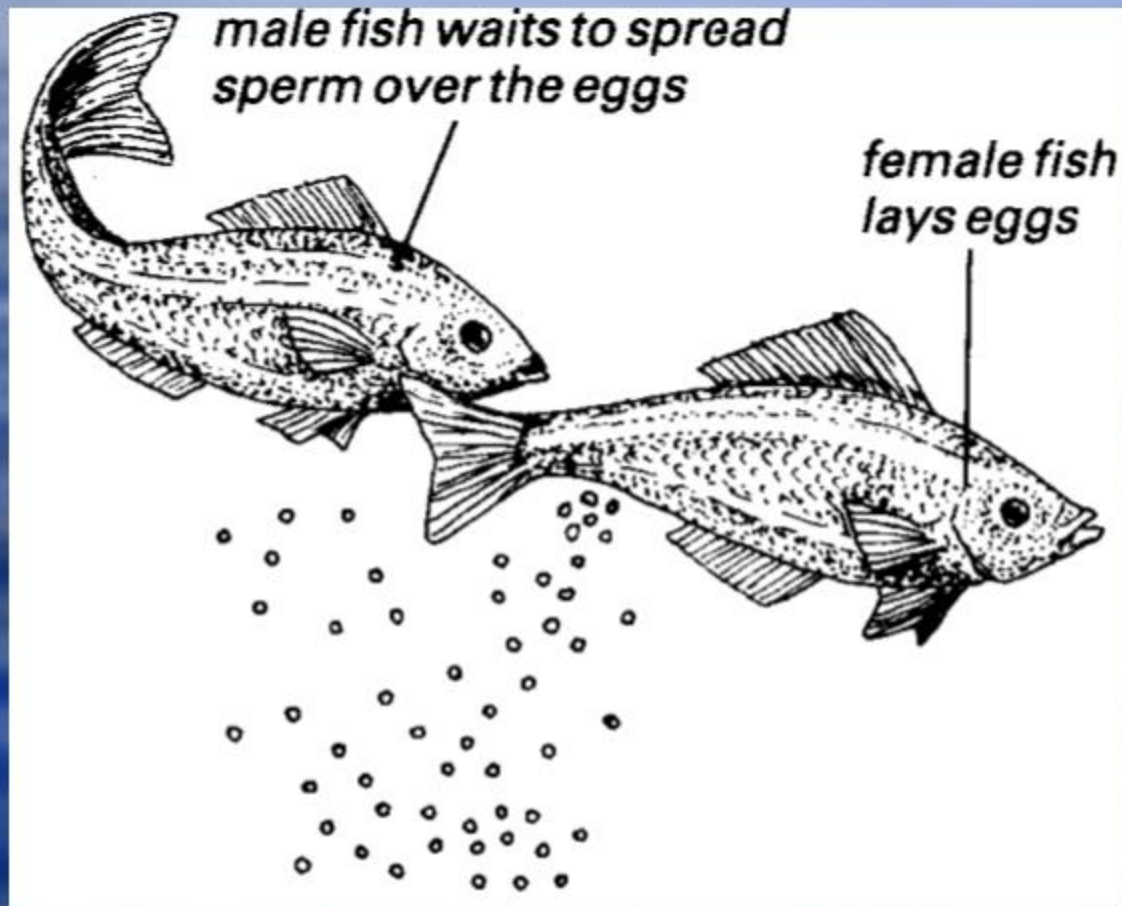


Reproduction in Fishes



Reproduction

What defines “male” vs. “female”?



Sexual strategies:

Females must be “careful” in mate selection due to cost

Male investments in reproduction :

advertisement, colors, tubercles, kypes, displays, nest building, territorial defense, parental care, brood guarding

Anatomy

Hagfish, lamprey: single gonads
no ducts; release gametes into body cavity



Anatomy

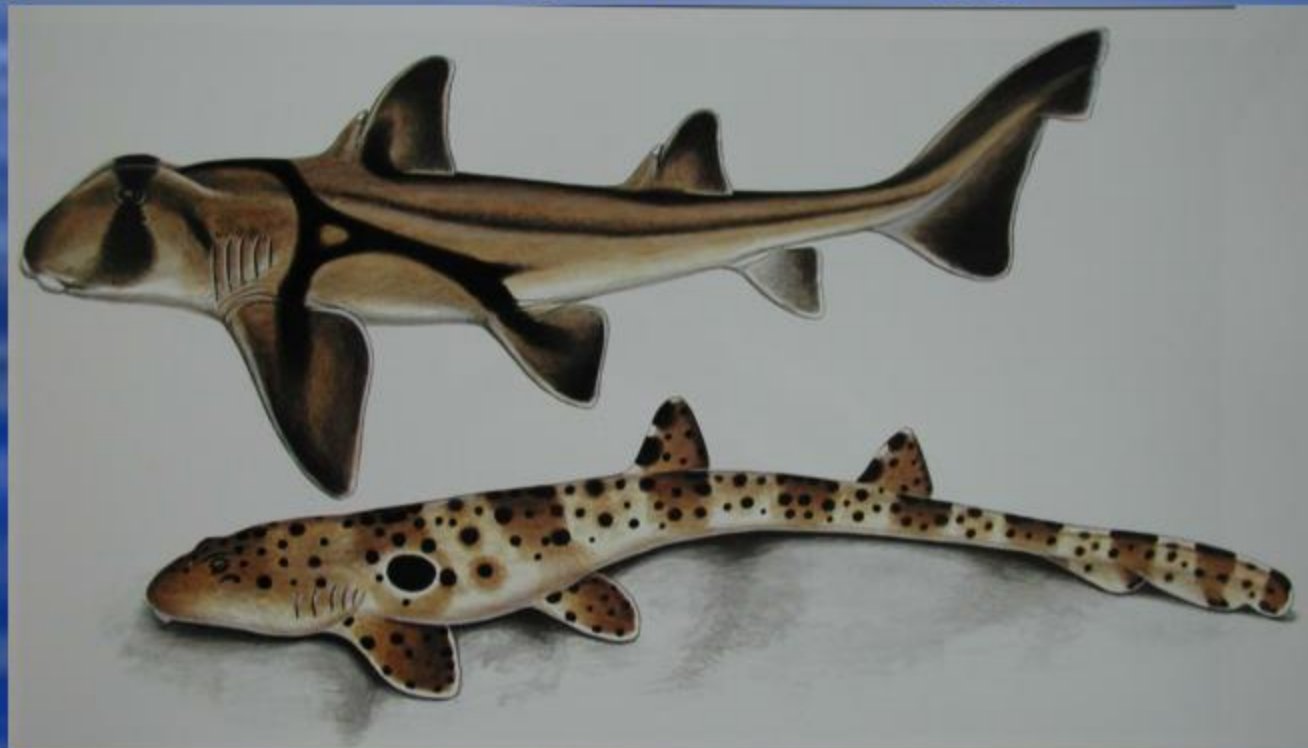
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Sharks: paired gonads

internal fertilization

sperm emitted through cloaca, along grooves in claspers



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Chimaeras, bony fishes: paired gonads

external and internal fertilization

sperm released through separate opening



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Most teleosts:

ova maintained in continuous sac from ovary to oviduct

exceptions: Salmonidae, Anguillidae, Galaxidae, non-teleosts

- these release eggs into body cavity when ripe

Anatomy

In general:

gametes produced only during spawning season
gonads reduced during non-reproductive season



Timing and location of spawning

Strategy:

- avoid competition for spawning habitat
- maximize access to food for offspring
- minimize access to offspring by predators

Example: Lake Champlain (New York/Quebec)

anadromous – salmon

catadromous – eels

deep-water fall spawners – lake trout, whitefish

medium depth spawners – smelt

littoral spawners – sculpins, sunfishes

stream spawners – suckers, darters, minnows

pelagic eggs – burbot

Reproduction

Bioenergetics: $C = E + M + G + S + R$

C – consumption

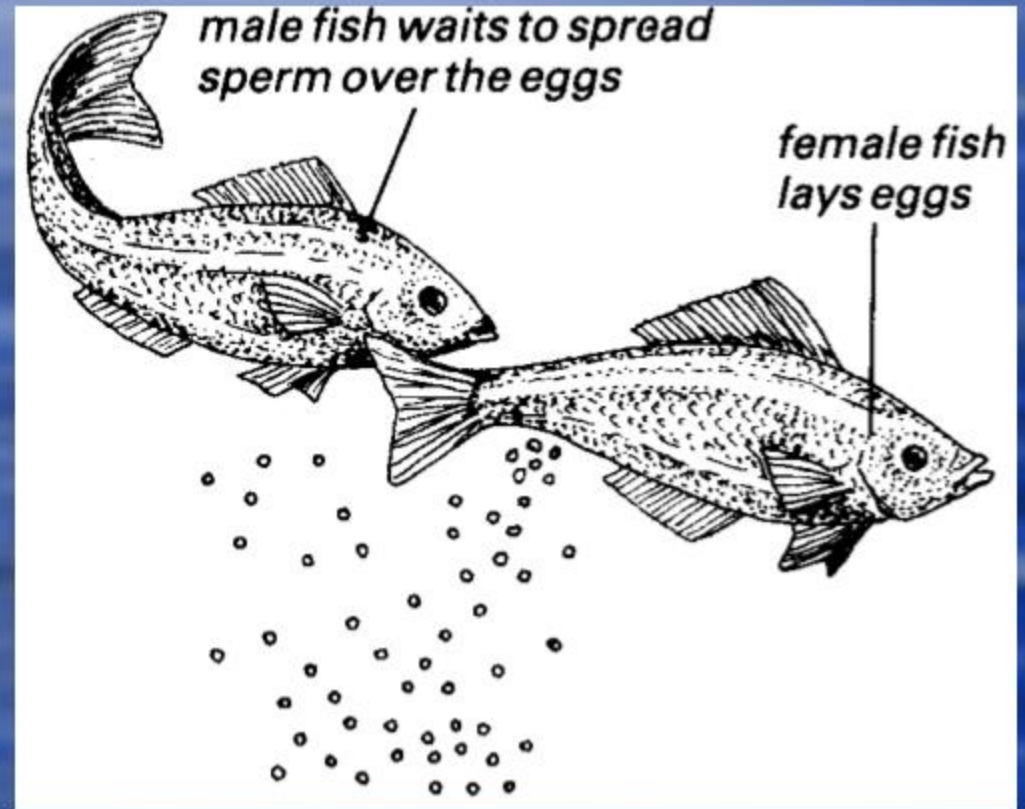
E – excretion

M – metabolism

G – growth

S – storage

R – reproduction



Reproduction

Fecundity

- egg size and number inversely related
- egg number directly related to female size (within species)
related to food supply, competition
= population-regulating mechanism



Reproduction

Fecundity

Fractional spawners – produce eggs continuously,
spawn frequently

Batch spawners – single reproductive season
release all eggs in a short period

