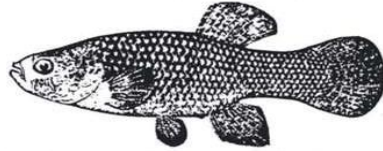


## FISH OF THE ESTUARY

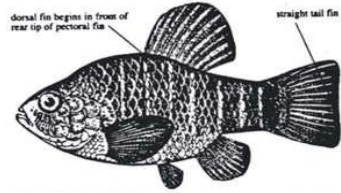
### *FUNDULUS HETEROCLITUS*, Mummichog

Max. 5-6 in.  
Most are 3 ½ -4 in.



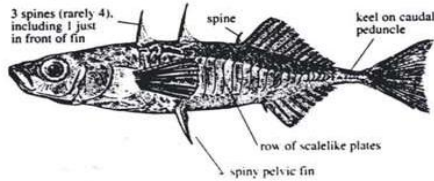
### *CYPRINODON VARIEGATUS*, Sheephead Minnow

Max 3 in.



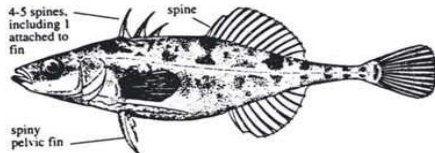
### *GASTEROSTEUS ACULEATUS*, Three-spined stickleback

Has 3 to 5 spines (note: there is also a Two-spined stickleback that has 5-6 bony plates).  
Has many bony plates. (More than 6)  
Max size 4 in.  
Most < 3 in.

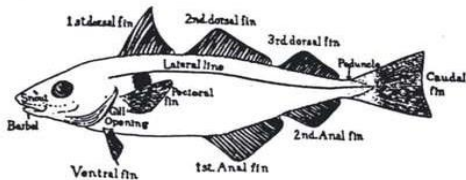


### *APELTES QUADRACUS*, Four-spined stickleback

Has 2 to 4 spines.  
No bony plates.  
1 ½ -2 ½ in.

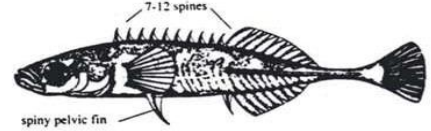


### FISH DIAGRAM



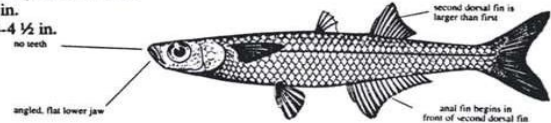
### *PUNGITUS PUNGITUS*, Nine-spined stickleback

Has 7 or more spines  
Not more than 3 in.  
Most are 2-2 ½ in.



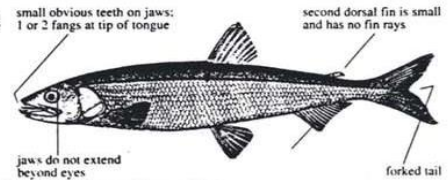
### *MENIDIA*, Silverside

Up to 5 ½ in.  
Most are 4-4 ½ in.



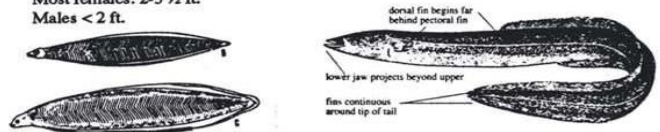
### *OSMERUS*, Smelt

Max. 13-14 in.  
Most 7-9 in.



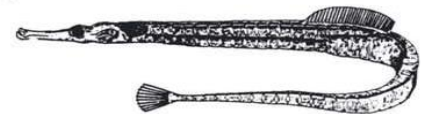
### *ANGUILLA ROSTRATA*, American Eel

Adults: up to 4 Ft.  
Most females: 2-3 ½ ft.  
Males < 2 ft.



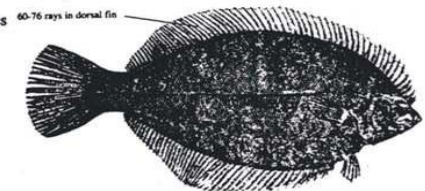
### *SYNGNATHUS*, Pipefish

Max: 12 in.  
Most are 4 to 8 in.



### *PLEURONECTES AMERICANUS*, Winter Flounder

Max. 23 inches  
Most adults are 12-15 inches

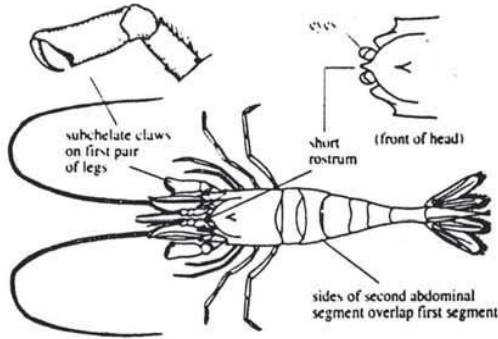


**When identifying fish:** Look at body shape, and presence and location of fins. For example, Smelt are easily identifiable from Silversides, when you notice that Silversides have two dorsal fins. (See fish diagram to learn fin names). Fish of the same species are often different sizes and colors. *Size and color are generally not good identifying features.*

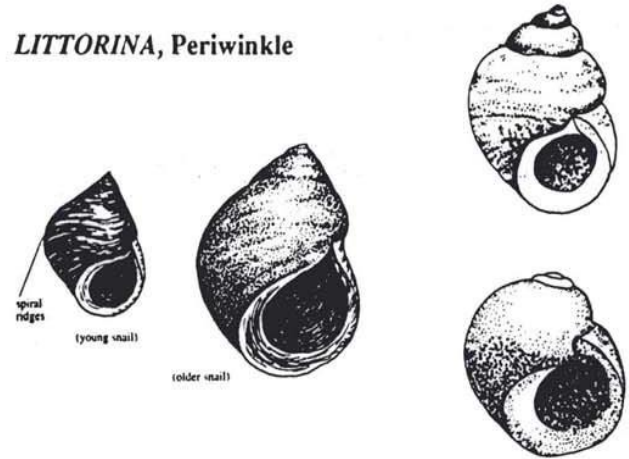
If you are collecting fish in water of low salinity, you may catch fish not found on this chart. On your data form, you may simply label these "freshwater fish." If you have The National Audubon Society Field Guide To New England look in section on freshwater fish to identify other species.

## MARINE ANIMALS OF THE ESTUARY

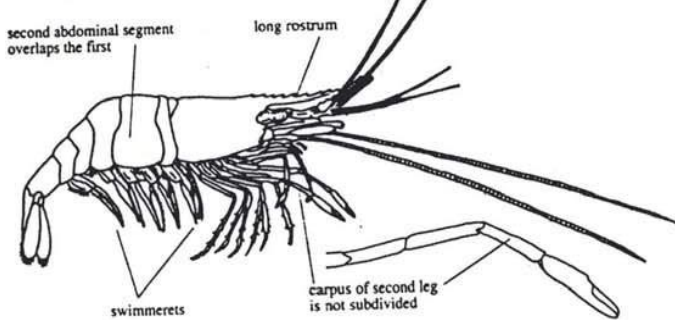
**CRANGON SEPTEMSPINOSA, Sand Shrimp**  
< 6 cm.



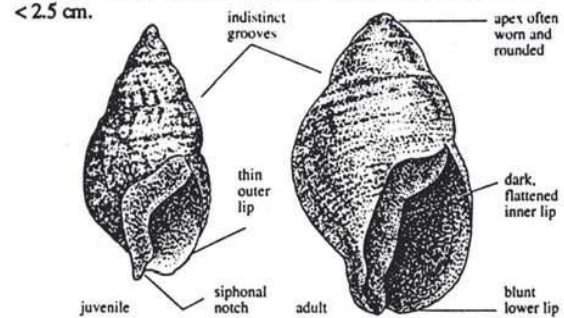
**LITTORINA, Periwinkle**



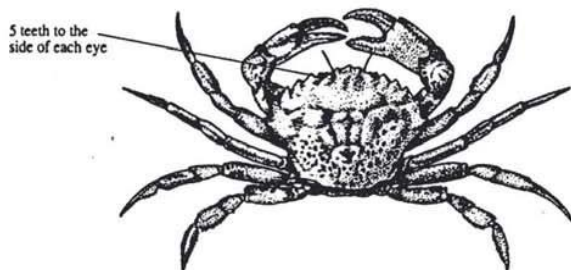
**PALAEONETES Grass Shrimp**  
< 5 cm.



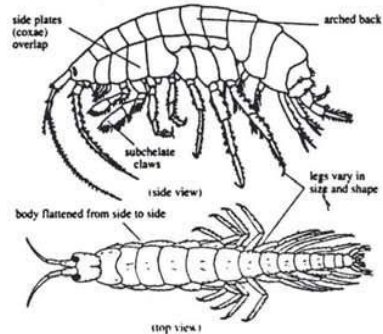
**ILYANASSA OBSOLETA, Eastern Mud Snail**  
< 2.5 cm.



**CARCINUS MAENAS, Green Crab**  
shell width < 8 cm.



**Typical Gammarid Amphipod**



**When identifying animals:** Look at body shape. For example, Periwinkles are easily identifiable from Mud Snails, when you notice that Periwinkle shells are much more rounded than Mud Snail shells. Animals of the same species are often different sizes and colors. *Size and color are generally not good identifying features.*

If you are collecting animals in water of low salinity, you may catch animals not found on this chart. On your data form, you may simply label these “freshwater animal.” If you have The National Audubon Society Field Guide To New England look in section on freshwater animals to identify other species.

Shared with permission.

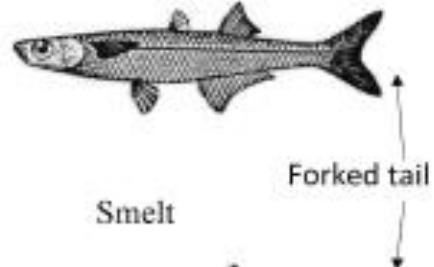
Credit: Fishes of the Gulf of Maine

### FISH OF THE ESTUARY

Mummichog



Silverside



Nine-spined stickleback



Smelt



Three-spined stickleback



Sheepshead minnow



Four-spined stickleback



American Eel



Pipefish



Winter Flounder

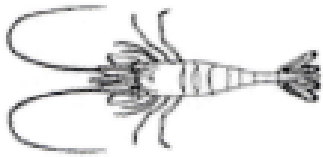


Shared with permission.

Credit: Fishes of the Gulf of Maine

## MARINE ANIMALS OF THE ESTUARY

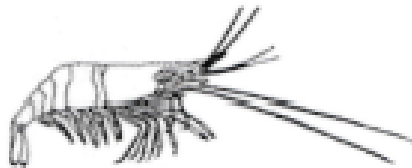
Sand Shrimp (sandy color)



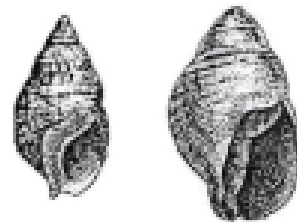
Periwinkle



Grass Shrimp (Glass Shrimp)  
(clear color)



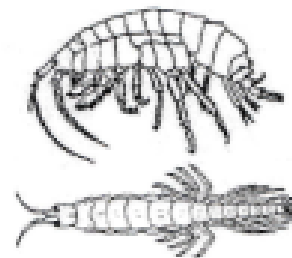
Eastern Mud Snail



Green Crab



Typical Gammarid Amphipod



**When identifying animals:** Look at body shape. For example, Periwinkles are easily identifiable from Mud Snails, when you notice that Periwinkle shells are much more rounded than Mud Snail shells. Animals of the same species are often different sizes and colors. *Size and color are generally NOT good identifying features.*

Shared with permission.

Credit: Fishes of the Gulf of Maine



**Common Plants of the Salt Marsh Identification Key**

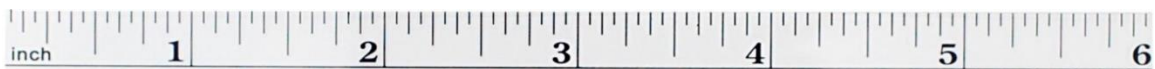
By Elizabeth Duff

1997

Please note: not all salt marsh plants are included in this key.

You may want to adapt this key, as you find additional species on your site

- 1a Plant has long grasslike leaves. (Leaves grow straight to a point.) .....8
- 1b Leaves are not straight and grasslike, or plant does not have a recognizable leaf.....2
- 2a Plant is fleshy. (If you squeeze a leaf or segment, your fingers get wet from the stuff inside) .....3
- 2b Plant is not fleshy. ....4
- 3a Plant does not have an obvious leaf.....Common Glasswort (*Salicornia europaea*)
- 3b Plant has numerous small leaves.....Sea blite (*Suaeda*)
- 4a Plant has a twig-like brown stem, and is a small shrub.....Marsh Elder (*Iva frutescens*)
- 4b Plant does not have a woody stem.....5
- 5a Leaves are triangular..... Orach (*Atriplex*)
- 5b Leaves are not triangular.....6
- 6a Plant grows straight with leaves growing along stem.....7
- 6b Leaves grow at the base of the plant. The top branches and grows many tiny lavender flowers.....Sea Lavender (*Limonium carolinianum*)
- 7a Plant grows single stem. Leaf is narrow, then widens, then narrows again to a rounded point. Plant grows golden yellow flowers in the fall. ....Seaside goldenrod  
.....(*Solidago sempervirens*)
- 7b Stems are single or forked. Leaf is straight and narrow, tapering to a point. Plant grows purple daisy-shaped flowers in the fall ..... Aster (*Aster*)
- 8a Plant stem is triangular. The plant grows flowers that resemble miniature pine cones.  
.....Saltmarsh Bulrush (*Scirpus*)
- 8b Stem is not triangular.....9
- 9a Leaves grow only from the base of the plant. ....10
- 9b Leaves grow along the stem.....11
- 10a Leaf grows ¼ to ½ inch wide, and up to 6 feet high. Plant grows brown spikes at the top.....Narrow leaved cattail (*Typha angustifolia*)
- 10b Plant leaf is less than ¼ inch wide, and grows numerous small greenish flowers on a spike. Plant grows from 8-32 inches tall. Seaside Arrow Grass (*Triglochin maritimum*)



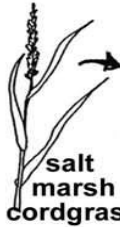
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11a Plant has numerous leaves growing all the way up the stem.....12

\* 11b Plant has few leaves (4 or less) and/or leaves grow only part way up the stem.....13

\*Please note: Salt marsh hay may have more than 4 leaves, but the leaves are widely spaced.

12 has 3 choices



12a Plant leaf is wide, greater than 1/2 inch. Stem is round and hollow. Plant grows a large silky plume at the top. Plant can be 6 1/2- 14 feet high... Phragmites (*Phragmites australis*)

12b Plant leaf is narrow. (Less than 1/8 inch.) Plant has many leaves growing in two directions, like a lot of V's on the stem. Leaves are light green, and can be flattened out. .... Spikegrass (*Distichlis spicata*)

12c Plant leaf is about 1/4- 1/2 inch wide. Plant grows 1-8 feet high. Plant grows tall close to water. Leaves are dark green or yellowish green. Leaves feel rough. Plant flower and seeds grow hugging the center of the plant. Saltmarsh cordgrass (*Spartina alterniflora*)

13a Plant stem is, solid, and round. Flower/seed pods are round, and form from the side of the stem, rather than at the very end. ....Black Grass (*Juncus gerardi*)



black grass

13b Live plant stem is generally green and jointed, Plant flower and seeds grow on the very end of the stem.....14

14a Plant leaf is about 1/4- 1/2 inch wide. Plant grows 1-8 feet high. Plant grows tall close to water. Leaves are dark green or yellowish green. Leaves feel rough. Plant flower and seeds grow hugging the center of the plant. Saltmarsh cordgrass (*Spartina alterniflora*)

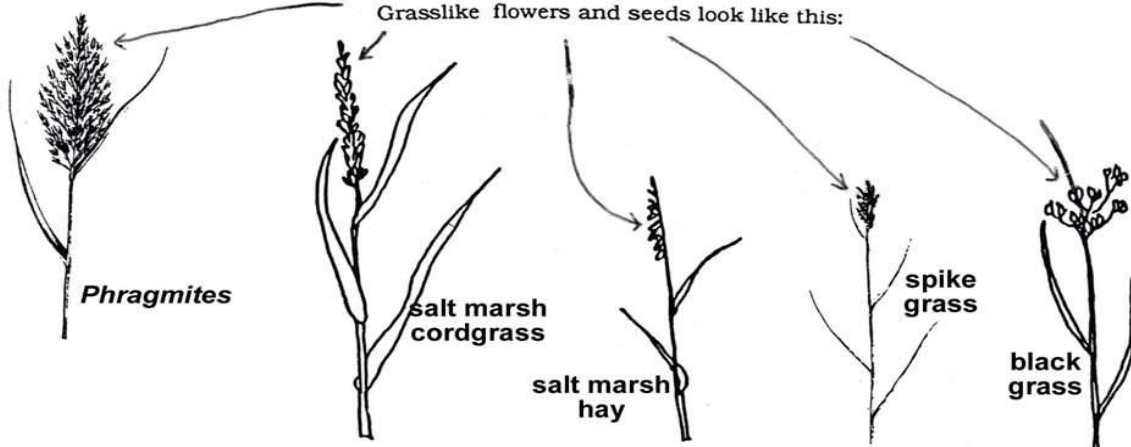


14b Leaf is extremely skinny (It looks like it might fit through a needle eye.) Its sides curve inward. Plant flower and seeds grow on one side of a stalk, (like the teeth on a comb.)

.....Saltmeadow cordgrass (*Spartina patens*)

Additional saltmarsh/brackish water plants not included in this key are: Purple loosestrife, marsh fern, silverweed, amaranth, and numerous upland grasses, and upland species.

Grasslike flowers and seeds look like this:



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-Triangular Stem

**Saltmarsh Bulrush**  
*Scirpus robustus*

- triangular stem
- leaves 1/2 " wide



**Saltmarsh Sedge**  
*Carex paleacea*

- plant grows 1 -3 feet tall
- grasslike leaves 1/10 - 1/3 inch wide
- seed heads look evenly spaced apart
- seed heads droop to one side



**Saltmarsh Cordgrass**  
*Spartina alterniflora*

- long tapered leaves
- seed heads grow close to main stem



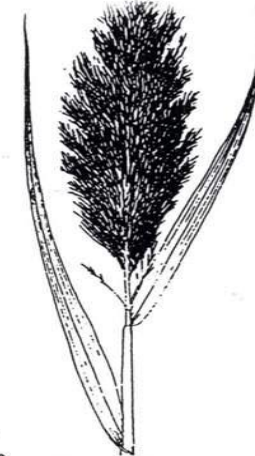
**Freshwater Cordgrass**  
*Spartina pectinata*

- long leaves tapered to threadlike ends
  - leaves 1/5 " to 2/5 " wide
  - seed heads on short stalks and have bristles
- (p. 112)



**Cattail**  
*Typha angustifolia*

- leaves grow from the base
  - seed heads cigar like on the stem
- (p. 99)



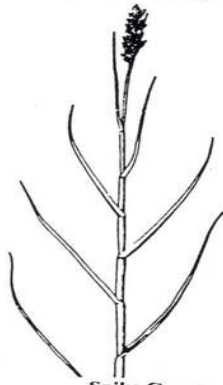
**Common Reed**  
*Phragmites australis*

- stems round and hollow
  - silky, feathery seed heads at top of stem
- (p. 106)



**Saltmeadow Cordgrass**  
*Spartina patens*

- very narrow leaves
- low spreading grass



**Spike Grass**  
*Distichlis spicata*

- leaf is narrow, less than 1/8 in.
- many leaves grow in two directions, looks like V's on stem



**Creeping Bent Grass**  
*Agrostis stolonifera*

- low growing, creeping
- leaves 2 - 4 " long



**Switchgrass**  
*Panicum virgatum*

- grows in clumps
- seed heads grow on many branches near the top



**Black Grass**  
*Juncus gerardii*

- grasslike, 8 - 24 inches tall
- one to two long leaves
- plant stem is solid and round
- flower/ seed pods are round, similar to peppercorns

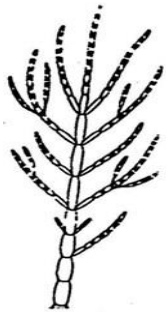


**Saltmarsh Arrowgrass**  
*Triglochin maritimum*

- leaves grow from the base
- leaves up to 20 " long
- seeds grow on a spike

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**Brackish Marsh Plants (Not grasses)**



**Glasswort**  
*Salicornia europaea*

- fleshy
- stems jointed



**Sea Blite**  
*Suaeda linearis*

- fleshy
- fleshy leaves, flat on one side, rounded on other



**Sea Milkwort**  
*Galearia maritima*

- low growing, creeping
- leaves round tipped up to 4/5" long and 1/4" wide



**Wild Morning Glory**  
*Calystegia sepium*

- grows like a vine, up to 10 feet long
- triangular shaped leaves

(p. 223)



**Marsh Orach**  
*Atriplex patula*

- arrowhead shaped leaves
- very small flowers in ball shaped clusters

(p. 127)



**Umbrella Sedge**  
*Cyperus filicinus*

- grass-like and low growing
- stems have three edges
- long thin leaves extend from bottom of flower

(p. 177)



**Silverweed**  
*Potentilla egedii*

- leaves grow from the base
- leaves silvery hairy beneath
- leaves toothed and increase in size toward the tip

(p. 136)



**Smartweed**  
*Polygonum punctatum*

- stem jointed
- leaves taper at both ends
- small green or white flowers on spikes



**Purple Loosestrife**  
*Lythrum salicaria*

- candlestick flowers, purple
- leaves are heart shaped at one end

**(Invasive Species)**



**Water Hemp**  
*Amaranthus cannabinus*

- stem smooth
- tiny seeds grow along the stem on spikes



**Saltmarsh Aster**  
*Aster subulatus*

- daisy-like flowers
- leaves clasp the stem
- leaves grow alternately (not across from each other)



**Seaside Goldenrod**  
*Solidago sempervirens*

- leaves grow along the stem
- leaves 4 - 16 inches long
- flowers at the top of stem, yellow



**Marsh Elder**  
*Iva frutescens*

- twig-like brown stem
- is a small shrub
- Leaves are opposite (grow in pairs)

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