ANNEX A

Environmental Documentation

1 – Sample Dive Survey and Sample Log Sheet

2 – Sample Dive Video Guidance

3 – Coastal NL Marine Macrofauna ID Guide for Diver

4 – Coastal NL Marine Macroflora ID Guide for Diver

Dive Survey and Sample Log Sheet

Site Name:		Date:	
DFRP #:		Water Depth:	
Station ID:		Weather:	
Start Time:		Sea State:	
Finish Time:		Equipment/Samplers:	
GPS Co-ordinates:			
Location Description: *(e.g., northeast corner of waterlot)*			
Sediment Samples Collected: *(for Chemical Analysis)*	Container Details (#, Vol): Area Sampled (L, W, D): Method of Collection:		
Bulk Sediment Samples Collected: *(for Benthic Taxonomic I.D.)*	Container Details (#, Vol): Area Sampled (L, W, D): Method of Collection:		
Macrofauna Observed:			
Fish/Shellfish Specimens Collected:	#: Species: #: Species: #: Species:		
Macroflora Observed:			
Harbour Bottom/Substrate: *(Type, Colour, Texture)*			
Underwater Infrastructure: *(e.g., wharf pilings, outfall/intake pipe, retaining wall, dam, etc.)*			
Physical Impacts: *(e.g., geotechnical failure, dredged/ excavated material, infilling, obstructions, debris, sewage, fish pots, sunken vessel, etc.)*			
Other Disturbances: *(e.g., iridescence or oily sheen, unusual or unpleasant odours, increase in plant growth or bacterial mats, etc.)*			
Deviations from Sampling Plan:			
Other:			

☐ Photos ☐ Video (no audio) ☐ Video (with audio)

Dive Video Guidance:
Dive Survey, Marine Sediment and Biological Tissue Sampling
DFO MSSP in NL

The following guidance is provided when obtaining video footage of benthic habitat during dive surveys conducted for the Fisheries and Oceans Canada (DFO) Marine Sediment Sampling Program (MSSP) in Newfoundland and Labrador:

- If video voice over is available, speak while recording video and describe all relevant observations.
- Clearly identify location at the start of the video.
- Record GPS coordinates at each video survey location (may be different from proposed location).
- Refer to identification guides for assistance with identifying marine aquatic life:
    1. Coastal Newfoundland and Labrador Marine Macrofauna Identification Guide
    2. Coastal Newfoundland and Labrador Marine Macroflora Identification Guide: Brown Algae
    3. Coastal Newfoundland and Labrador Marine Macroflora Identification Guide: Seagrass, Green and Red Algae
- If the proper species name is not known, describe it as best as possible. The key is consistent use of names between locations. For example, periwinkle vs. winkle.
- Describe the following items during the dive survey and record on log sheet:
    1. Fauna
    2. Flora
    3. Harbour bottom and substrate (type, colour and texture)
    4. Underwater Infrastructure (e.g., wharf pilings, outfall/intake pipes, retaining wall, dam, etc.)
    5. Physical Impacts (e.g., geotechnical failure, dredged/excavated material, infilling, obstructions, debris/litter/garbage, sunken vessel, fish traps/pots/nets, etc.)
    6. Other Disturbances (e.g., iridescence or oily sheen, unusual or unpleasant odours, increase in plant growth or bacterial mats, etc.)
- Obtain representative videos and photos of flora and fauna observed in the survey area, including species that cannot be identified.
- If the area is densely crowded with flora, gently move flora to the side and obtain representative video of the substrate and any fauna present along the sea floor.
- Pan camera around 360° very slowly. If the camera is panned too quickly, it could result in poor video quality.
- Use item for scale such as a graduated stick or rod taped at every 10 cm. Lay it on the seafloor when capturing video of substrate or flora/fauna (**refer to Photo 1, attached**). This will allow the reviewer to size the substrate in the area.
- Describe the substrate in the video using the below table for reference (**refer to Table 1, attached**).

Dive Video Guidance:
Dive Survey, Marine Sediment and Biological Tissue Sampling
DFO MSSP in NL

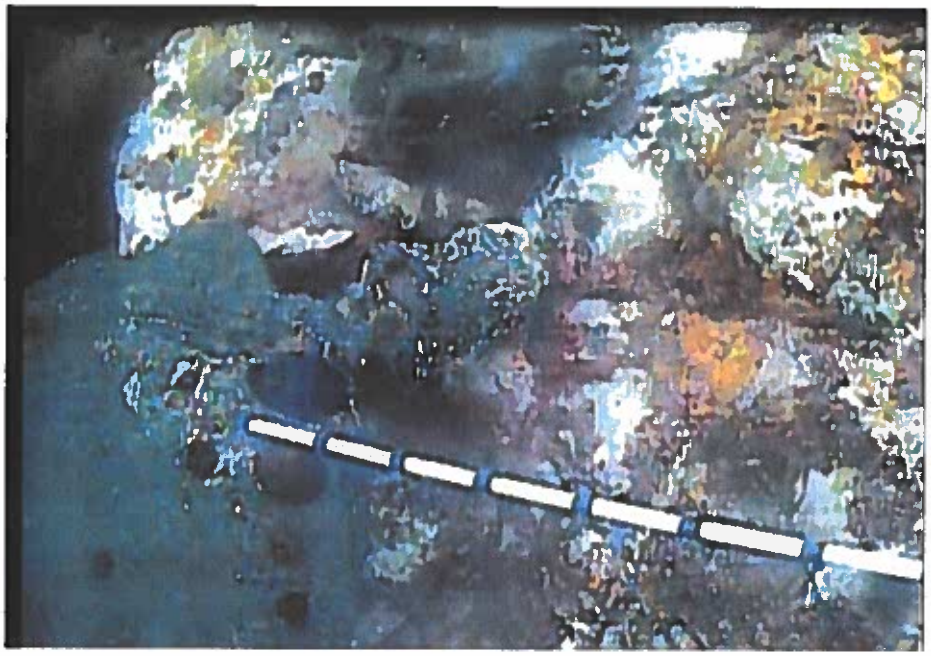

Photo 1: Rod taped at every 10 cm and placed on seafloor for scale.

Table 1: Substrate Categories for Benthic Habitat Classification

Broad Class	Detailed Class	Size Range (mm)	Size Comparison
Bedrock		Continuous rock	
Coarse	Boulder	>250	>Basketball
	Rubble	130-249	Volleyball
Medium	Cobble	30-130	Softball
	Gravel	2-30	Toonie
Fine	Sand	0.06-2	Toonie thickness
	Mud	Material encompassing both silt and clay; <0.06	Human hair
Organics		A soft material containing 85% or more organic / detritus materials	
Shells		Calcareous remains of shellfish or invertebrates containing shells	
Mixed Substrate		Equal coverage of two or more broad or detailed class substrates	

Based on Wentworth-Udden particle scale (Kelly et al. 2009; Wentworth 1922).

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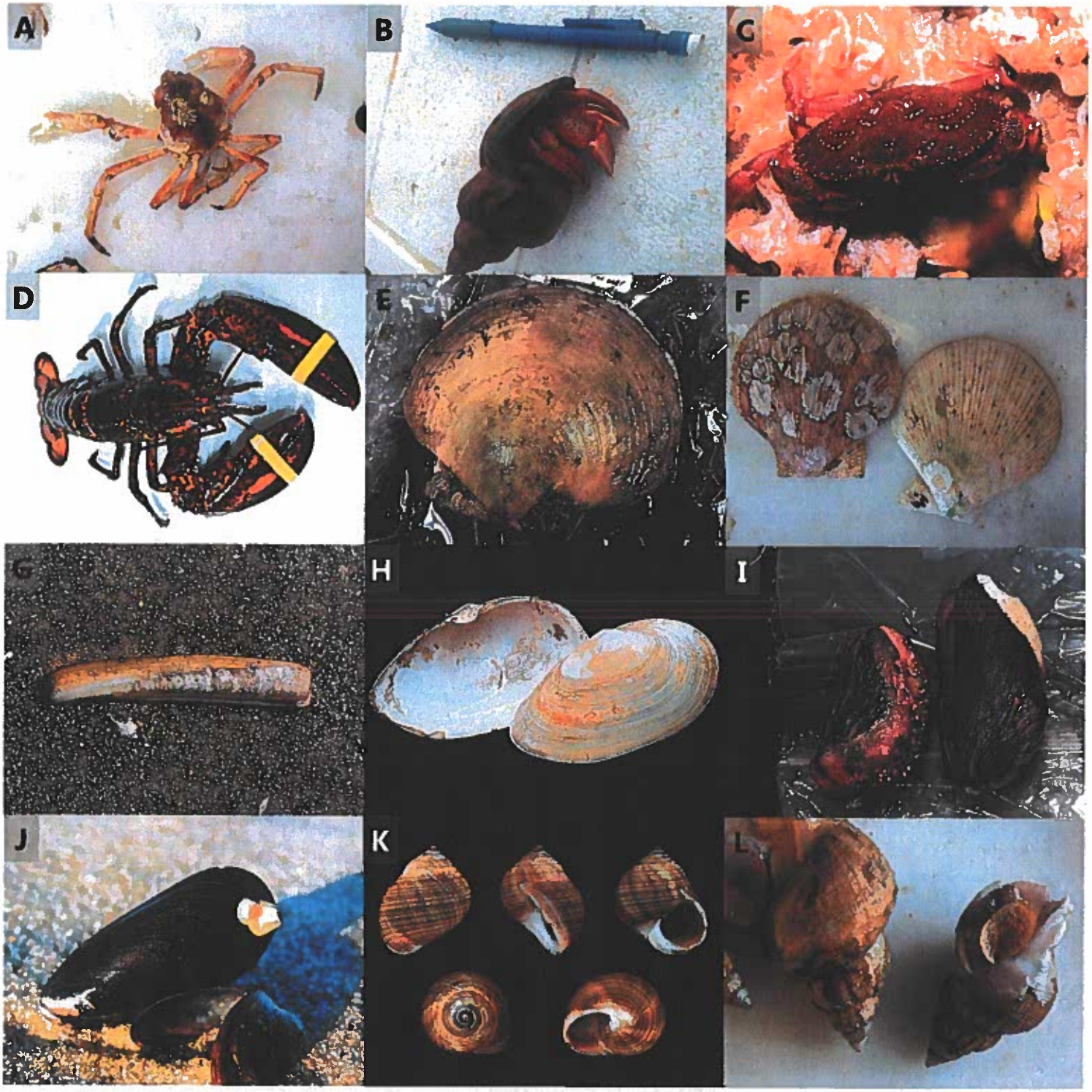
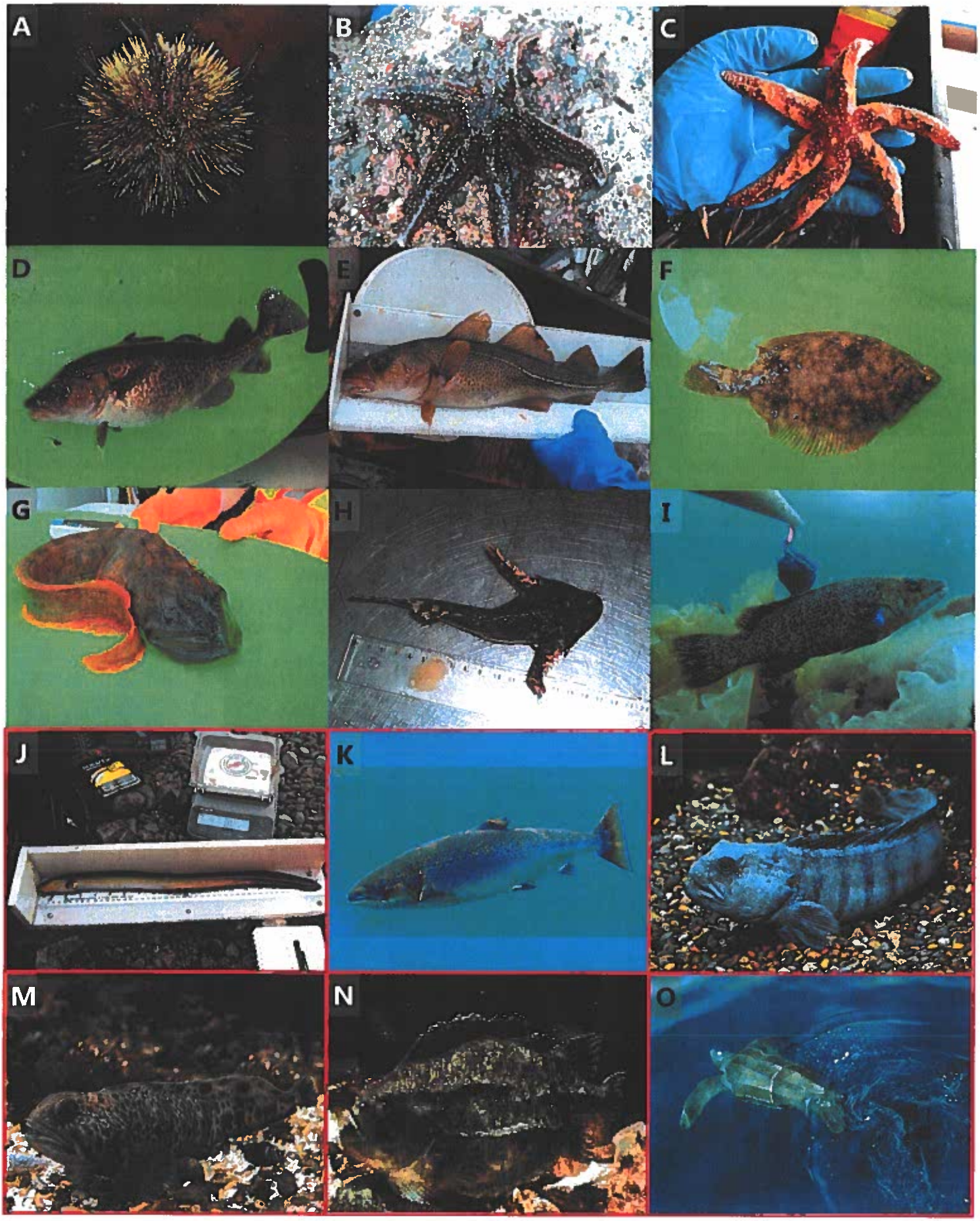
Coastal Newfoundland Marine Macrofauna Identification Guide

(11June2018)



(A) Toad crab, **(B)** Hermit crab, **(C)** Rock crab, **(D)** Lobster, **(E)** Sea scallop, **(F)** Icelandic scallop, **(G)** Jackknife clam, **(H)** Soft shell clam, **(I)** Horse mussel, **(J)** Blue mussel, **(K)** Periwinkle, **(L)** Whelk. *Photo Attribution: Lobster by Roberto Rodríguez, Jackknife clam by Hans Hillewaert, Mussel by Benutzer:Darkone CC BY-SA 2.0, Periwinkle by H. Zell CC BY-SA 3.0.*



(A) Green sea urchin, **(B)** Common sea star, **(C)** Polar sea star, **(D)** Greenland cod, **(E)** Atlantic cod, **(F)** Winter flounder, **(G)** Ocean pout, **(H)** Sculpin species, **(I)** Cunner. Species at Risk: **(J)** American eel, **(K)** Atlantic salmon, **(L)** Atlantic wolffish, **(M)** Spotted wolffish, **(N)** Lumpfish, **(O)** Leatherback sea turtle.

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Coastal Newfoundland Marine Macroflora Identification Guide: Brown Algae

(11June2018)

Brown Algae: **(A)** Black Whip Weed, **(B)** Brown filamentous, **(C)** Brown Seaweed, **(D)** Cord Weed, **(E)** Edible Kelp, **(F)** Kelp, **(G)** Knotted Wrack, **(H)** Ribbon Weed, **(I)** Rockweed, **(J)** Sausage Weed, **(K)** Sea Colander, **(L)** Sour Weed.

wood.

Coastal Newfoundland Marine Macroflora Identification Guide: Seagrass, Green and Red Algae

(11June2018)

Seagrass: **(A)** Eelgrass

Green Algae: **(B)** Green filamentous, **(C)** Hollow Green Weed, **(D)** Sea Lettuce

Red Algae: **(E)** Banded Weed, **(F)** Coral Weed, **(G)** Crustose algae, **(H)** Dulse, **(I)** Fine red weed, **(J)** Irish Moss, **(K)** Tubed weed, **(L)** Laver