

## Forage Fish Spawning Habitat Beach Survey

### Samplers

|                 |  |
|-----------------|--|
| Name(s)         |  |
| Organization    |  |
| Date (mm/dd/yy) |  |
| Time (24hr)     |  |
| Camera ID       |  |

|        |              |       |               |
|--------|--------------|-------|---------------|
| Region | Municipality | Beach | DFO Mngt Area |
|        |              |       |               |

### Last High Tide

|              |
|--------------|
| Time (24hr): |
| Elevation:   |

### 2<sup>nd</sup> Effective High Tide

|              |
|--------------|
| Time (24hr): |
| Elevation:   |

### Calculating Tidal Elevation

| Station | Elevation Change | Subtract Eye Height | Elevation Difference | Time | Elevation Relative to Chart Datum | Tidal Elevation (Chart Datum) |
|---------|------------------|---------------------|----------------------|------|-----------------------------------|-------------------------------|
|         | A                |                     |                      |      |                                   |                               |
|         | B                |                     |                      |      |                                   |                               |
|         | C                |                     |                      |      |                                   |                               |
|         | D                |                     |                      |      |                                   |                               |
|         | Total            |                     |                      |      |                                   |                               |

### Current Conditions

|                    |  |
|--------------------|--|
| Weather Conditions |  |
| Air Temp (°C)      |  |
| Wind Direction     |  |
| Wind Speed (km/hr) |  |
| Water Temp (°C)    |  |

### Episodic Events (determined prior to or after sampling)

Has there been a storm event in the last week? Yes No

|                    |  |                               |  |
|--------------------|--|-------------------------------|--|
| Date of Storm      |  |                               |  |
| Maximum Wind Speed |  | Precipitation from Event (mm) |  |
| Storm Category     |  |                               |  |

Evidence of beach wrack harvesting? Yes No

### Site Attributes

|                      |                   |                   |                |                            |                 |              |
|----------------------|-------------------|-------------------|----------------|----------------------------|-----------------|--------------|
| Aspect               | <i>Direction:</i> |                   |                |                            | <i>Bearing:</i> |              |
| Beach Slope          | Flat (<5°)        | Inclined (5°-20°) | Steep (>20°)   | <i>Slope of Beach (°):</i> |                 |              |
| Max. Fetch Distance* |                   |                   |                |                            |                 |              |
| Exposure**           | Very Protected    | Protected         | Semi-Protected | Semi-Exposed               | Exposed         | Very-Exposed |

\* Determined from chart measurements

\*\* Determined based on Maximum Fetch Distance

### Sediment Sample Collection

| Sample Station # | Time (24hr) | UTM (m) | Beach | Uplands | Width (m) | Length (m) | Sample # | Landmark Object | Landmark Distance (m) | Tidal Elevation | Shading | Sample Type | Surf Smelt | Sand Lance | Photo # |
|------------------|-------------|---------|-------|---------|-----------|------------|----------|-----------------|-----------------------|-----------------|---------|-------------|------------|------------|---------|
|                  |             |         |       |         |           |            |          |                 |                       |                 |         |             |            |            |         |
|                  |             |         |       |         |           |            |          |                 |                       |                 |         |             |            |            |         |
|                  |             |         |       |         |           |            |          |                 |                       |                 |         |             |            |            |         |

### Comments

### Forage Fish Spawn Sample Lab Analysis

Analyzed by: \_\_\_\_\_

| Sample Station # | Sample # | Species | # of Eggs | Alive:Dead | Comments |
|------------------|----------|---------|-----------|------------|----------|
|                  |          |         |           |            |          |
|                  |          |         |           |            |          |
|                  |          |         |           |            |          |

## Field Observation Sampling Codes

### Calculating Tidal Elevation (Step by step)

1. Record the beach station.
2. Use a survey rod and sight (rested on a 1m post/at eye height) to determine the elevation change from the sample transect. Several measurements may be necessary due to the water line distance.
3. Subtract your eye height/1m from each "Elevation Change" measurements.
4. **Record the time at the water line.** This is important.
5. Record the "Elevation Relative to Chart Datum" from your tide chart (acquired from [www.tides.gc.ca](http://www.tides.gc.ca)); it is the elevation at the time closest to the time recorded.
6. "Tidal Elevation (Chart Datum)" is equal to the Total "Elevation Difference" plus "Elevation Relative to Chart Datum". If the tidal elevation is 2m to 3m above the Mean Low Low water (acquired from CHS Marine Maps), the sample transect is within the typical tidal elevation for Pacific sand lance and surf smelt spawning. There is no need to change the elevation of the transect if it is within 1m of the ideal elevation.

**Episodic Events** refer to storm events that may be altering the beach structure, impacting forage fish spawning behaviour or egg distribution. *Note: All wind speeds exclude gusts.* (1 knot = 1.85km/hr)

|                               |               |
|-------------------------------|---------------|
| Strong Wind Warnings          | 20 – 33 knots |
| Gale Warnings                 | 34 – 47 knots |
| Storm Warnings                | 48 – 63 knots |
| Hurricane Force Wind Warnings | > 64 knots    |

**Aspect** is the compass direction that the beach slope faces.

**Beach Slope** is measured using a clinometer to measure the slope of the sample transect width (5m).

**Fetch Distance** is the horizontal length over which wave-generating winds are able to blow with little to no disruption.

**Exposure** refers to how vulnerable the beach is to wave action.

| Effective Fetch Range (km) | Wave Exposure Category |
|----------------------------|------------------------|
| <1                         | Very Protected         |
| 1-10                       | Protected              |
| 10-50                      | Semi-Protected         |
| 50-500                     | Semi-Exposed           |
| 500-1000                   | Exposed                |
| >1000                      | Very Exposed           |

**Beach:** Dominant sediment character of the beach

- 0 = silt and mud (<0.0625 mm, feels "slimy")
- 1 = pure sand (0.0625 mm – 2.0 mm, feels "gritty")
- 2 = pea gravel (2.0 mm – 4.0 mm, "fine gravel") with sand base
- 3 = pebble gravel (4.0 mm – 64.0 mm) with sand base
- 4 = cobble gravel (64.0 mm – 256.0 mm) with sand base
- 5 = boulder gravel (256.0 mm – 4096.0 mm) with sand base
- 6 = boulders (>4096.0 mm) with sand base
- 7 = gravel to boulders without sand base
- 8 = bedrock, no habitat

**Uplands:** Integrity of uplands (up to 30m of high water mark)

|                          |                   |
|--------------------------|-------------------|
| 1 = natural, 0% impacted | 4 = 75% impacted  |
| 2 = 25% impacted         | 5 = 100% impacted |
| 3 = 50% impacted         |                   |

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**Width** of the potential spawning substrate band to the nearest metre. Judged by character of substrate and presence of spawn, when possible.

**Length** of the beach up to 300 metres (150 metres on either side of the station).

**Landmark Object:** Note a landmark object in the uplands area that is parallel to the sample zone transect. This will be the object from which you measure the "Sample Zone" distance from. Ensure that the object chosen is a permanent structure.

**Sample Zone:** Distance of sample zone transect to the landmark, in metres to the nearest 0.5 metre. This will be used in order to repeat a sampling event in the exact same location.

**Tidal Elevation:** This value can be transferred from the "Calculating Tidal Elevation" portion of the data sheet. This value is the "Tidal Elevation (Chart Datum)".

**Shading:** Amount of spawning substrate zone that is shaded, averaging over the entire length of the beach station. Consider the best interpretation for the entire day and season.

|                   |                 |
|-------------------|-----------------|
| 1 = fully exposed | 4 = 75% shaded  |
| 2 = 25% shaded    | 5 = 100% shaded |
| 3 = 50% shaded    |                 |

**Sample Type:** S = Scoop or B = Bulk

If eggs are visible to the naked eye it is only necessary to take a single 500mL scoop of sediment to be processed. In all other cases a bulk sample is to be collected.

**Smelt & Sand Lance:** Subjective field assessment of spawn intensity apparent to the naked eye.

0 = no eggs visible

L = light, but apparent

M = medium, readily visible

H = heavy, broadly abundant

W = eggs observed in winnow

**Photos:** Take 6 photos standing at the centre of the sample transect.

**\*Photo 1:** Completed sample tag

**\*Photo 2:** Sediment w/scale at transect

**Photo 3:** Beach backshore

**Photo 4:** Beach right

**Photo 5:** Beach foreshore (towards water)

**Photo 6:** Beach left

*\*If multiple samples are collected at a single station, only photos 1 & 2 should be repeated for each sample.*

**\*\*\*I certify that to the best of my abilities, the surveys recorded on this data sheet and the associated samples were collected and documented to the methodology instructed to me and the information I am providing are the true and accurate results of these surveys.**