



Effort and focal follow protocol

Phases of orca predation on seals: figuring out the orca time budget

Not foraging

Not foraging for seals: not a single member of the orca group is seen searching, approaching, or pursuing seals – they may instead be foraging for fish, socializing, or resting.

Search

Search: one or more member(s) of the orca group are seen **actively searching** in areas where seals are either present or expected to be present (=near a known seal haulout). Circling around land/rocks/shallow waters, spy-hopping to look for seals.

Approach

Approach: directed movement towards seals, by one or several members of the orca group. **Seals are not yet escaping/avoiding** the orca, although may have seen them and be more vigilant (=head up, frequent gaze around).

Pursuit

Pursuit: fast directed movement towards seal(s), by one or several members of the orca group. **Seal(s) show escape/avoidance** response.

**Capture
/injury
/escape**

Capture: orcas are seen killing a seal, or remains of a seal are seen following a pursuit. Report injury if seal is seen to escape but with visible damage/ blood. Report escape if seal was confirmed to be alive and seemingly uninjured after the pursuit. Please record **'unknown'** if you are unsure what happened to the seal.

Seal monitoring form: please make a new record when conditions or site changes

Time & location	Start and end time of watch, and monitoring site location (please provide site name below the table, and coordinates if not a regular monitoring site)
Sea state	0 = mirror calm; 1 = slight ripples, no foam crests; 2 = small wavelets, glassy crests, but no whitecaps; 3 = large wavelets, crests begin to break, few whitecaps; 4 = longer waves, many whitecaps; 5 = moderate waves of longer form, some spray; 6 = large waves, whitecaps everywhere, frequent spray; 7 = sea heaps up, white foam blows in streaks; 8 = long, high waves edges breaking, foam blows in streaks; 9 = high waves, sea begins to roll, dense foam streaks.
Swell height	Light = <1m; Moderate = 1-2 m; Heavy = >2 m

Visibility	Visibility: < 1 km; 1-5 km; 6-10 km; >10 km
Number of seals (best estimate; zero if none seen)	<u>Total</u> – total number of seals, including harbour/grey/unknown species <u>Harbour</u> – number of harbour seals present (leave empty if unknown) <u>Grey</u> – number of grey seals (leave empty if unknown) <u>Pups</u> – number of pups (<5 months old)
Num. of boats	<u>W motor</u> – motor boats, RIBS, yachts <u>No motor</u> – kayaks, dinghies, rowing boats, rafts
Num. of people	If seals present, number of people on foot within seals' vicinity (<500m)
Notes and other potential prey	Any fish seen to jump out of water, presence of anglers, fishing boats, etc. For example, mackerel and herring are potential fish prey to killer whales. Presence of other potential prey such as porpoises, otters, swimming seabirds Additional notes such as any other sources of disturbance for the seals than killer whales, grey-harbour seal interactions, species ID confidence, tide state, habitat description (rocky/sandy, sea weed, water colour, SAC?)

Focal follow observations: if you can, please track an individual orca and its associated group, adding a new row when behaviour (esp. seal foraging phase) or group composition changes.

Time & location	Start and end time of when the whales first and last seen, and site location (please provide corresponding site name and coordinates below the table)
Focal ID	Please label the individual you are tracking for this watch with a number. Change the number and make a new record if you lose track of it. If focal follow is not possible, leave this empty and focus on group behaviour instead.
Focal whale behaviour	Dive duration (min) – typical/average dive duration of focal whale, in minutes Inter-breath-interval (s) – typical/av. time interval between breaths, in seconds
Number of orca (circle the number that includes focal whale)	<u>Total</u> – total number of whales associated with focal, include males/calves/other <u>Male</u> – number of males seen (clearly taller fin) <u>Calves</u> – number of calves (small body, foetal folds, yellow, close to mother) Please indicate to which of the three categories the focal tracked whale belongs by circling the appropriate number.
Distance	Min distance of the orca to shore in metres (100 m= 109 yards= 328 feet; 1000 m=0.6 mi)
Orca behaviour	Any behaviours displayed <i>by the group</i> : Surfacing; Normal Swim; Fast Swim; Feeding; Leap/Breach; Tail Slap; Bow-ride; Rest/Milling; Sexual; Aggression
Foraging for seals phase	Choose one: None/ Search/ Approach/ Pursuit/ Capture/ Injury/ Escape. Please see overleaf for definitions. If individual orcas in the group are in different phase, choose the later phase (e.g., select pursuit rather than approach).
Number of seals affected	Number of seals approached, pursued, captured, injured, escaped, as defined in previous column. Leave empty if whales are searching for seals, or not foraging. <u>Total</u> – total number of seals, including harbour/grey/unknown species <u>Harbour</u> – number of harbour seals, all ages (leave empty if unknown) <u>Pups</u> – number of pups (<5 months old)
Notes	Additional info such as known orca individuals, and seal species ID confidence.

Never disturb wildlife keep your distance, use binoculars, minimize noise, and leave at the first sign of disturbance. Know the signs; seals can be vulnerable while resting on land. More info: [Scottish Marine Wildlife Watching Code](#).