

C-Well Assessment Ethogram for Dolphin Behaviour by Animal Welfare Expertise

Understanding an animal's behaviour is key to monitoring their welfare, and optimising it. It's also a vital tool for studying them in the wild! Whether you're an animal caretaker, researcher, or just interested in it, if you understand how behaviour is actually measured, you'll then be able to critically evaluate information regarding an animal's behaviour.

To start with, all behaviours need to be defined so that you can compare frequencies of different activities e.g. object play vs social play, and so that everyone's on the same page when discussing the results. An "ethogram" is a catalogue of all the behaviours observed in an animal.

The C-Well Assessment for dolphin welfare has an accompanying behavioural ethogram, which you'll find in this document. The behaviours here are generally applicable to all delphinid species in the wild and in captivity, although of course the C-Well is an assessment for captive dolphins only.

After you have your ethogram of behaviours, the next step is to develop your method of behavioural observation: check back on the AWE website (<u>www.animalwelfareexpertise.com</u>) and Isabella's instagram (@thedolphindoctor) for upcoming information on this!

Please feel free to get in contact if you have any questions or to request some of the research behind any of these behaviours.

To reference this ethogram in any publications, please cite as: Clegg, I. L. K. (2020) C-Well Assessment Ethogram for Dolphin Behaviour. Accessed at <u>https://www.animalwelfareexpertise.com/the-cetacean-welfare-assessment</u>

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BEHAVIOUR	DEFINITION	SUMMARY OF RELEVANCE TO WELFARE
Resting behaviour	The dolphin is stationary either at the water's surface or on the pool floor, with their eye(s) half or fully closed and no head orientation movements	Sleeping behaviour in dolphins is often difficult to measure, so resting behaviour is usually used as a substitute. In captivity, dolphins should be given the opportunity and a safe, quiet environment to rest in. They need around 4-6 hours of sleep per 24 hrs, and can rest while swimming (not measured by this definition). In the wild, opportunity to sleep is also an important welfare factor: one recent study showed that the daytime rest period for Hawaiian spinner dolphins was being severely disrupted by wildlife tourism, where the dolphins have boats around them for 80% of the time and that this limits their resting behaviour.
Slow swimming	Swimming with small tail beats, eyes generally open, head may orientate to conspecifics, may change position around other dolphins if synchronous, speed generally <2m/s	Noting down swim speeds of dolphins is important because it shows the level of arousal in the group i.e. how excited or fearful they are. This can provide key information as to the meaning of the behaviour. The best example is when looking at synchronous swimming: slow synchronous swimming indicates positive, relaxed mental states, whereas fast synchronous swimming indicates high stress levels. Synchronous swimming should therefore always be paired with swim speed!
Medium swimming	Swimming with moderate tail beats, eyes generally open, alert to stimuli, speed roughly 2-4 m/s	
Fast swimming	Swimming with vigorous tail beats (c. 3 beats/s), head moves up and down, eyes open, speed is around 4 m/s	
Social play	The dolphin engages in behaviours including rubbing, nudging, chasing, attempting to bite, pushing, and leaping with another dolphin, and all more gently and at lower speeds (< 4m/s) than agonistic interactions. There may be a few	Social play (that is consensual, and does not consistently escalate into agonistic interactions against one participant) is an indicator of positive mental state. Construction noise was found to decrease levels of social play in a group of bottlenose dolphins, further supporting its use as a welfare indicator. The presence of juveniles in a group can increase the





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	instances of chasing at high speeds or pushing, but these are not prolonged nor overtly aggressive in nature.	levels of social play in adults, as has been shown with belugas, which is one reason why preventing breeding in captive animals (and therefore the presence of juveniles) can decrease welfare.
Object play	The dolphin shows play behaviours (e.g. nudging, rubbing, biting, pushing, leaping) involving a item/bubble/part of the environment, which can be solitary or part of a group.	Object play indicates an interest in interacting with the environment around the dolphin, which is a sign of positive welfare. A lack of exploratory behaviour, either because the animal is apathetic, or too fearful of its surroundings, is a sign of reduced welfare. Willingness to explore novel objects is a common test of how comfortable an animal is with its environment, and it can also reveal elements of their personality (e.g. bold or shy).
Pectoral rubbing	The dolphin moves its pectoral fin(s) back and forth to rub the body of another, in a non-sexual way (i.e. not concentrated on genitals).	This is an affiliative behaviour and a sign of positive social bonding. In captivity, tactile behaviours like pectoral rubbing are an indication of appropriate social grouping and this contributes to positive welfare. A complete lack of pectoral rubbing could be an indicator of less strong social bonds, but is not necessarily a sign of poor welfare as some animals are more tactile than others.
Synchronous swimming	The dolphin is swimming within 1 body length of another dolphin, showing parallel movements and body axes, with only a few seconds delay at most between movements.	Synchronous swimming is an affiliative behaviour and has been directly linked to positive welfare states, as higher levels were found to correlate to more optimistic cognitive biases (another sign of good welfare). It is also associated with reconciliation: after a conflict occurs in social groups, synchronous swimming is one of the ways that dolphins are able to reaffirm social bonds afterwards. Speed of swimming can change the welfare relevance of this behaviour: for example, fast synchronous swimming is often seen in high stress situations.



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Biting	The dolphin bites or rakes (or attempts) to do this to another dolphin. When at high speeds this is usually an aggressive behaviour, but may be a play behaviour at lower speeds, especially between juvenile males.	Biting is often an escalation of non-contact agonistic behaviour, such as threat displays and posturing. It does sometimes occur in play, but the rakes left by the teeth are not often severe. In both the wild and captivity, if seen at excessive levels (and accompanied by other negative social behaviours), it can be a sign of incompatible social grouping as well as a cause of acute and/or chronic stress. The number of rakes (tooth marks) and the depth of the rakes are an indicator of the severity of biting interactions (and are measured in the C-Well Assessment). For instance, a single rake mark at superficial depth is of a lower severity to multiple deep rake marks that are either all over or on a particular part of the body and expose tissue underneath the skin. Position of marks is important too: rakes around the genital slit can also indicate sexual behaviour.
Jaw clap	The dolphin gestures with an open mouth and forcefully snaps jaws shut; may also open and close jaws rapidly. Often makes a loud pop or clap sound.	This is a threat display and a non-contact agonistic behaviour, intended to warn the receiver about the actor's arousal and emotional state. Jaw claps can escalate to chasing and contact aggression if the actor doesn't get the outcome he/she is seeking from the recipients e.g. access to females. Excessive aggression levels, usually indicated by high levels of biting, chasing, jaw claps, social isolation and rake marks, are a sign of poor social compatibility, and an indicator of negative welfare.
Sexual behaviour	The dolphin either engages in genital to genital contact, with or without full penetration, with both dolphins' bodies generally on the same axis; or, it engages in genital-non genital contact, where it positions its own body part (e.g. fin, rostrum) in contact with a conspecific's genitals, or projects genitals onto a body part of the conspecific.	Sexual behaviour is an important part of dolphins' social lives. Dolphins show much homosexual behaviour (sexual behaviour with the same sex), and they use this as a means of maintaining bonds in their social network. While sexual behaviour can be affiliative and affirm social bonds with conspecifics, dolphins can also force sexual behaviour upon unwilling recipients. This occurs in the wild and captivity, and if seen in excessive levels, it may indicate poor welfare of the recipient





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		(especially if accompanied by aggressive chasing and biting).
Side breach	The dolphin purposefully leaps out of water and lands on its side, usually making a loud slapping sound.	Similar to tail slapping, side breaching is thought to have many functions, but is generally a communication strategy. Repetitive breaching is thought to indicate frustration, and is sometimes a precursor of aggression. Multiple side breaches in a row have been anecdotally reported to occur when training sessions are late, when there is an undesired object in the pool, and in the wild as a response to whale-watching boat presence. Some also suggest that in the wild their function may be to signal prey location, confuse prey or to dislodge parasites or remora. However, side breaching can also sometimes be seen in play sequences, so should always be interpreted carefully by looking at the wider context.
Tail slap	The dolphin lifts its tail up and slaps the surface of the water with it, often repeating this a number of times. Either slaps with the top or underside of its tail.	Tail slapping is thought to have many communication functions, but is often observed as a potential sign of frustration. Tail slaps have been documented in response to whale-watching boats and dolphin swim tours that approach too close, and have also been reported in captivity during group aggression, or when feeding sessions are delayed. Tail slaps can also occasionally be seen in social play, or in the wild to communicate between group members.
Surface look	The dolphin lifts its head out of the water while eyes are directed towards the side of the pool, above the surface. It may lift its head while swimming forwards, or it may be floating stationary while looking above the surface. The dolphin may be looking at a stimulus (object,	A dolphin showing some level of "surface looking" before a training session is a good sign, as it shows they are looking forward to it. However, excessive frequencies of this usually anticipatory behaviour, where the dolphin is spending a ¼ or more of their time doing this each day, is likely to indicate poor welfare and an under-stimulating environment. Although not yet studied, anticipatory behaviour could





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	person) or anticipating the arrival of the stimulus.	also be measured in some wild populations, such as those cetaceans depredating fishing gear.
Abnormal Repetitive Behaviour	The dolphin performs a behaviour repeatedly, where it does not vary and appears to have no function e.g. fence biting (only if invariant), water throwing, stone chewing, circle swimming (only if using specific part of pool in a repeated, invariant path)	Abnormal Repetitive Behaviours (ARBs) are one of the most common indicators of poor welfare, but are notoriously hard to define. ARBs can also persist a long time after the cause of the behaviour has been removed, making welfare interpretations more difficult. Furthermore, there are some instances where the animals showing ARBs are actually found to have better welfare than those that do not. However, all true ARBs indicate that at some point, the animal struggled to cope with its environment. ARBs generally fall into two categories, either oral or locomotor, but very little research has been conducted with dolphins to examine the range and causation of ARBs in captivity.
Chuffing	The dolphin forcefully exhales air from its blowhole so that it makes a loud whooshing or "chuffing" sound.	Chuffing can be distinguished from coughing by the fact that it is usually not repeated in quick succession like coughs are. Coughing or accidental water exhalation generally has a different tone to it: coughs often sound like more of a grating or chesty sound, and with water inhalation the coughs are very close together you can hear the water being spluttered out of the lungs. Chuffing is a sign of high arousal in wild and captive dolphins, and is usually linked to negative emotions such as frustration or stress. It has been shown to increase during proximity to tourist boats in the wild, and to loud sounds and other stressors in captive environments. While chuffing can be hard to distinguish from coughing for the untrained ear, it can also be a useful additional indicator for dolphin emotions.