

# Assessing welfare and survival in stranded cetaceans- Round two

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Start of Block: Default Question Block

## Assessing welfare and survival in stranded cetaceans- Round two

### Welcome back!

*Thank you very much for participating in this study. In this second round of the Delphi survey, I provide you with a summary of all answers provided in the first round, along with follow-up questions.*

### Project Description

Cetacean strandings are global phenomena that have been occurring for centuries. Research suggests that these events are occurring more frequently due to climate change and anthropogenic activities. Strandings may involve one animal alone or many animals (mass stranding).

Costly and logistically challenging attempts to 'rescue' live stranded cetaceans are often undertaken. Yet there is limited information regarding the success of such efforts, and the effects of stranding and human intervention on both the welfare and survival of individuals remains poorly understood.

To address this knowledge gap, this research project implements the Delphi technique. The Delphi method is an iterative surveying technique which relies on a panel of experts. In the first round experts answer open unstructured questions, and these are then reviewed in the second round. The reviewing of answers is crucial to the success of a Delphi survey. Therefore, **you can still participate in this second round even if you did not complete round one.**

In the first questionnaire key factors that may affect the welfare and survivorship of stranded cetaceans, and potential observable/measurable indicators to assess welfare state and likelihood of survival at cetacean strandings were suggested. This information has been used to inform the design of this second questionnaire.

In this study a stranded cetacean is a wild whale, dolphin or porpoise that has "run aground" alive. A stranding event is considered as the time the animal first comes ashore until it either dies or is refloated. Any events (e.g. natural or human) that occur whilst the animal is ashore should be considered as part of the stranding event.

*This second round contains 18 questions and should take approximately 30 minutes to complete. It must be submitted by Friday 16th April 2021.*

I am looking forward to receiving your responses and would like to thank you for your valuable input and time. If you have any questions, please do not hesitate to contact Rebecca M  
Boys [r.boys@massey.ac.nz](mailto:r.boys@massey.ac.nz)

By clicking next you are indicating that you have read the information sheet and give your consent to take part.

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Page Break

Region of work

- ☐ Africa
  - ☐ Asia
  - ☐ Central America
  - ☐ Europe
  - ☐ North America
  - ☐ Oceania
  - ☐ South America
- 

Please choose the field of **expertise** that most aligns with you:

- ☐ Cetacean expert (including cetacean conservation and biology)
  - ☐ Animal welfare expert (including animal welfare science, welfare/animal ethics)
  - ☐ Cetacean expert with knowledge and/or focus on welfare
  - ☐ Animal welfare expert with knowledge and/or focus on cetaceans
  - ☐ Veterinarian
  - ☐ Other (please specify): \_\_\_\_\_
- 

What is your **current** field of **work**?

\_\_\_\_\_

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## Welfare

The questions on this page relate to the welfare of stranded cetaceans.

Stranded cetacean: Whale, dolphin or porpoise that has 'run aground' alive

Stranding event: Time from when the animal comes ashore until it dies or is refloated. The event includes any natural and human based events that occur during a stranding.



In the previous survey I asked you to tell me what animal welfare means to you and additionally what it means when considering stranded cetaceans.

Some suggestions were provided and your responses have been collated into themes. Below are some of the most common themes.

Please indicate for each of the themes the **level of importance** you think the feature has in **assessing** the **welfare/well-being** of stranded cetaceans.













You can give the same level of importance to multiple themes.

0= **No importance** for assessing welfare

5= **Some importance** for assessing welfare

10= **Great importance** for assessing welfare

0   1   2   3   4   5   6   7   8   9   10

Physical state and wellbeing, health, injury and disease status	
Animal's experience/perception of situation, mental or psychological state or well-being, affective states or feelings	
Pain and suffering, distress, stress or fear	
Ability to live in normal/natural social and environmental conditions or habitat	
Appropriate decision-making about re-floating or euthanasia, and targeted rescue/re-floatation efforts to prioritize animal welfare	
Normal, natural or wild behaviour	
Treatment and care by humans, including during stranding response	
Sufficient food and water	
Physical comfort/discomfort	
Normal physiology and homeostasis	
Overall wellbeing or Quality of life	
Human activities in environment	



In the previous survey I asked what knowledge gaps could be addressed that would improve the ability to assess the welfare of stranded cetaceans. Your responses have been collated into themes. The most commonly mentioned knowledge gaps are presented here.

Please score your agreement on whether increased knowledge of each theme would improve our ability to assess the welfare of stranded cetaceans.

0= Filling this gap **would not improve** our ability to assess stranded cetacean welfare

10= Filling this gap **would greatly improve** our ability to assess stranded cetacean welfare.

If you feel that you do not have the knowledge to score a particular gap please tick "Don't know"

Don't know

0 1 2 3 4 5 6 7 8 9 10

Post release monitoring to understand survival, outcomes or success of re-floatation	
Collection and documentation of empirical data to assist triage/ decision-making	
How to make decisions about when and how to euthanise stranded cetaceans	
Lack of information, education and awareness for potential responders about if, when and how to respond	
Effects of species, animal size and features of the stranding (geographical location and duration) on welfare	
Ability to diagnose internal injuries ante-mortem, including capture myopathy	
Ability to assess physiological indicators and recognise deviations from normal/baseline	
Ability to assess what animals feel or their mental state	
Understanding the health and disease status of the animal	
Lack of specialist/ expert advice and consultation from those with field experience and veterinarians	
Assessment and interpretation of indicators of neurological state and responsiveness/sensibility	
Ability to assess body condition	
Causes of stranding and how to prevent stranding	
Ability to interpret stranded cetacean behaviour in terms of welfare state	
Understanding social support and communication among animals	







In the previous survey I asked what the welfare issues are at cetacean stranding events. Your responses have been collated into themes. The most commonly mentioned issues are presented below.

Please score each of the following issues based on **how badly it might affect welfare** of stranded cetaceans

0= This will **not** affect welfare

5= This will have a **bad** affect on welfare





10= This will have a **severely bad** affect on welfare

If you feel that you do not have the knowledge to score a particular issue please tick "Don't know"

Don't know

0 1 2 3 4 5 6 7 8 9 10

Inappropriate human intervention, poor handling, responder training and experience, and public pressure influencing decisions	
Pain and suffering due to physical injury or trauma caused by stranding, particularly substrate	
Stress, fear, distress or pain caused by human presence, interactions, noise	
Effects of gravity, body weight, pressure on animal's organ function and physiology and causing internal injuries and pain as a result of not being supported by water	
Fear, stress, distress or helplessness at being unable to move or help themselves	
Fear and stress at being in a strange, novel environment	
Separation from conspecifics/social group, including mother-calf separation	
Suffering, stress and anxiety associated with stranding	
Skin damage and associated pain due to sunburn, dehydration/desiccation occurring when out of water in sun	
Feasibility of rescue/re-floatation based on human and equipment resources, location of stranding, time of day, responder expertise and experience and human safety	
Physical damage, stress, pain and thermal discomfort due to overheating, hyperthermia, heat stroke and hypothermia	
Fear and pain from predation	
Delays to deciding on euthanasia to relieve suffering	
Weather and environmental conditions	
Nutritional stress, poor body condition	

Animals suffering from illness, disease and underlying health conditions	
Difficulty breathing, inhalation of water	
Effect of species biology, resilience and stranding type on welfare outcomes	
Pain and its management	



Regarding the same potential welfare issues, please tell me **how much knowledge** you feel is available to **assess** how the **issue may affect** stranded cetacean **welfare**.

0=Knowledge is **insufficient**

5=**Some** knowledge is **present**





10=Knowledge is **complete**

If you feel that you do not have the knowledge to score a particular issue please tick "Don't know"

Don't know

0 1 2 3 4 5 6 7 8 9 10

Inappropriate human intervention, poor handling, responder training and experience, and public pressure influencing decisions	
Pain and suffering due to physical injury or trauma caused by stranding, particularly substrate	
Stress, fear, distress or pain caused by human presence, interactions, noise	
Effects of gravity, body weight, pressure on animal's organ function and physiology and causing internal injuries and pain as a result of not being supported by water	
Fear, stress, distress or helplessness at being unable to move or help themselves	
Fear and stress at being in a strange, novel environment	
Separation from conspecifics/social group, including mother-calf separation	
Suffering, stress and anxiety associated with stranding	
Skin damage and associated pain due to sunburn, dehydration/desiccation occurring when out of water in sun	
Feasibility of rescue/re-floatation based on human and equipment resources, location of stranding, time of day, responder expertise and experience and human safety	
Physical damage, stress, pain and thermal discomfort due to overheating, hyperthermia, heat stroke and hypothermia	
Fear and pain from predation	
Delays to deciding on euthanasia to relieve suffering	
Weather and environmental conditions	
Nutritional stress, poor body condition	

Animals suffering from illness, disease and underlying health conditions	
Difficulty breathing, inhalation of water	
Effect of species biology, resilience and stranding type on welfare outcomes	
Pain and its management	

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Please tell me about any barriers to assessing how these issues effect welfare.

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In the previous survey I asked you to suggest observable/measurable indicators to assess the welfare of stranded cetaceans. Your responses have been collated into themes. The most commonly mentioned indicator themes are presented here.

Please indicate the **value** that you think **each indicator has for assessing welfare state** of stranded cetaceans.

Please ensure that you are scoring how good an indication of welfare state each indicator is, not how practical these are to measure. A question on ease/practicality of measurement for the indicators comes next.

0= **Little**/no value



















5= **Some** value

10= **Great** value



If you feel that you do not have the knowledge to score a particular indicator please tick "Don't know"

Don't know

0 1 2 3 4 5 6 7 8 9 10

Abnormal movements and behaviours including arching, thrashing, straining, trying to move, agitated movements, slapping flukes, tremors/shivering	
Respiration rate and character/effort	
Signs of physical trauma, injuries and wounds	
Animal's level of response to stimuli/reflexes as a reflection of its level of awareness, alertness or consciousness	
Animals skin condition such as sunburn, peeling, cracking or blistering	
Body condition or nutritional status	
Weather, ambient temperature, sea and tidal conditions	
Animal age based on length/weight, and reproductive status	
Vocalisation rate and type	
Swimming ability and orientation when returned to water	
Core/internal body temperature	
Length of time stranded and number of re-strandings	
Heart rate and rhythm	
Presence and behaviour of pod members	
Measurement of blood parameters and serum/plasma chemistry	
Availability of resources including equipment	
Bleeding/fluids/mucus from orifices	
Signs of illness and disease	



Amount of human interaction and knowledge of responders	
Distance to animal's natural habitat type	



Regarding the same proposed indicators, please indicate **how easy/practical each indicator is to measure** during a stranding event.

0= **Difficult** to measure



















5= **May be measurable** depending on skills/equipment available



10= **Easy** to measure

If you feel that you do not have the knowledge to score a particular indicator please tick "Don't know"

Don't know

0 1 2 3 4 5 6 7 8 9 10

Abnormal movements and behaviours including arching, thrashing, straining, trying to move, agitated movements, slapping flukes, tremors/shivering	
Respiration rate and character/effort	
Signs of physical trauma, injuries and wounds	
Animal's level of response to stimuli/reflexes as a reflection of its level of awareness, alertness or consciousness	
Animals skin condition such as sunburn, peeling, cracking or blistering	
Body condition or nutritional status	
Weather, ambient temperature, sea and tidal conditions	
Animal age based on length/weight, and reproductive status	
Vocalisation rate and type	
Swimming ability and orientation when returned to water	
Core/internal body temperature	
Length of time stranded and number of re-strandings	
Heart rate and rhythm	
Presence and behaviour of pod members	
Measurement of blood parameters and serum/plasma chemistry	
Availability of resources including equipment	
Bleeding/fluids/mucus from orifices	
Signs of illness and disease	

Amount of human interaction and knowledge of responders	
Distance to animal's natural habitat type	

Please tell me about any barriers to measuring these indicators of welfare.

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For the proposed indicators below, please use your judgement to suggest the mental (affective) **experience/feelings** that may be inferred from observing the indicator.

For example, food-seeking behaviour could be used to infer the negative experience of hunger. Likewise, spending time near a preferred conspecific may be used to infer feelings of safety.

You can provide multiple suggestions for each indicator and you can suggest the same feeling/state for multiple indicators.

- ☐ Elevated respiration rate \_\_\_\_\_
- ☐ Reduced respiration rate \_\_\_\_\_
- ☐ Abnormal respiratory character \_\_\_\_\_
- ☐ Agitated movements \_\_\_\_\_
- ☐ Arching \_\_\_\_\_
- ☐ Thrashing \_\_\_\_\_
- ☐ Fluke slapping \_\_\_\_\_
- ☐ Tensing/straining \_\_\_\_\_
- ☐ Abnormal body posture \_\_\_\_\_
- ☐ Fin movement \_\_\_\_\_
- ☐ Head swinging \_\_\_\_\_
- ☐ Tremors/shivering \_\_\_\_\_
- ☐ Injury/Trauma/Wounds \_\_\_\_\_
- ☐ Reduced stimuli/reflexes \_\_\_\_\_
- ☐ Poor skin condition \_\_\_\_\_
- ☐ Poor body condition \_\_\_\_\_
- ☐ Abnormal swimming movements \_\_\_\_\_
- ☐ Elevated stress hormones \_\_\_\_\_
- ☐ Abnormal blood chemistry \_\_\_\_\_

- ☐ Abnormal haematology \_\_\_\_\_
- ☐ Vocalisation: rate, character \_\_\_\_\_
- ☐ Elevated body temperature \_\_\_\_\_
- ☐ Bleeding/fluids/mucus from orifices  
\_\_\_\_\_
- ☐ Elevated heart rate \_\_\_\_\_
- ☐ Abnormal heart rhythm \_\_\_\_\_
- ☐ Presence of disease or illness \_\_\_\_\_

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Please provide any additional comments about welfare here

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## Survival

The questions on this page relate to the survival of stranded cetaceans.

Stranded cetacean: Whale, dolphin or porpoise that has 'run aground' alive  
Stranding event: Time from when the animal comes ashore until it dies or is refloated. The event includes any natural and human based events that occur during the stranding.

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In the previous survey I asked you to tell me what survival likelihood means to you and additionally what it means when considering stranded cetaceans.

Some suggestions were provided and your responses have been collated into themes. Below are the most commonly suggested themes.

Please indicate for each of the themes the **level of importance** you think the feature has in **assessing** the **survival likelihood** of stranded cetaceans.

You can give the same level of importance to multiple themes.

0= No importance for assessing survival likelihood

5= Some importance for assessing survival likelihood

10= Great importance for assessing survival likelihood

0 1 2 3 4 5 6 7 8 9 10

Animal returns to normal life and full functioning in its natural environment	
The chance that the animal survives after stranding	
Animal does not die of stranding related injuries or damage	
Animals health condition, disease and illness status	
Animal returns and socially re-integrate with its conspecific group/pod	
Animal is able to respond and cope with natural conditions to ensure its survival	
Animal survives after refloating	
Animal returns to pre-stranding life and health status	
Survival is affected by species and size	
Animal alive 1 month after stranding	
Animal alive 1 year after stranding	
Animal does not restrand within days of refloat	
Animal alive 6 months after stranding	
Animal's body condition	
The number of re-stranded animals	
Response of animal when refloated	
Avoids suffering	
Cause of stranding still present	



In the previous survey I asked what knowledge gaps could be addressed that would improve the ability to assess survival likelihood of stranded cetaceans. Your responses have been collated into themes. The most commonly mentioned knowledge gaps are presented here.

Please score your agreement on whether increased knowledge of each theme would improve our ability to assess the survival likelihood of stranded cetaceans.

0= Filling this gap would not improve our ability to assess stranded cetacean survival likelihood  
10= Filling this gap would greatly improve our ability to assess stranded cetacean survival likelihood.

If you feel that you do not have the knowledge to score a particular gap please tick "Don't know"

Don't know

0 1 2 3 4 5 6 7 8 9 10



Lack of post release monitoring to measure survival outcomes	
Lack of normal/baseline blood parameters and profiles	
Lack of data for species-specific survival	
Lack of knowledge on the links between survival and welfare	
Ability to determine presence of myopathy	
Ability to diagnose diseases and infections on the beach	
Lack of knowledge about causes and prevention of strandings and effects of local ecosystem changes	
Lack of trained and skilled responders	
Ability to assess body condition and blubber thickness	
Lack of data on species distribution	
Lack of data on the effects of conspecifics presence on survival	
How to make decisions about when and how to euthanise stranded cetaceans	
Ability to triage current state/condition	
Ability to assess internal body temperature	
Lack of knowledge about hearing impairments	
Lack of standardised protocols to follow	
Lack of knowledge of treatments and their effectiveness	
Lack of knowledge on the links between external assessments and pathology	

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In the previous survey I asked what factors have the potential to affect stranded cetacean survival likelihood. Your responses have been collated into themes. The most commonly mentioned factors are presented below.

Please score each of the following factors based on how badly it might affect survival likelihood of stranded cetaceans

0= This will not affect survival likelihood


















5= This will have a bad affect on survival likelihood




10= This will have a severely bad affect on survival likelihood

If you feel that you do not have the knowledge to score a particular factor please tick "Don't know"

Don't know

0 1 2 3 4 5 6 7 8 9 10

Feasibility and speed of rescue/re-floatation based on human and equipment resources, location of stranding, time of day, responder expertise and experience and human safety	
Length of time stranded and number of re-strandings	
Weather and environmental conditions, including tides	
Physical injury or trauma caused by stranding	
Animal suffering from illness, disease and underlying health conditions	
Separation from conspecifics/social group	
Animal age based on length/weight and reproductive status	
Effects of gravity, body weight, pressure on animal's organ function and physiology and causing internal injuries and pain as a result of not being supported by water	
Body condition and nutritional status	
Availability of appropriate and timely human intervention and handling, responder training and experience	
Geographical location of stranding and being out of habitat or range	
Effect of species biology on survivorship	
Cause of stranding still present	
Stress, anxiety and associated conditions caused by stranding	
Presence of predators and scavengers	
Difficulty breathing, inhalation of water	
Skin damage and associated pain due to sunburn, dehydration/desiccation occurring when out of water in sun	

Substrate/terrain at the stranding location	
Abnormal movements and reduced limb function	
Animal awareness and neurological status	



Regarding the same factors that have the potential to affect stranded cetacean survival likelihood, please tell me how much knowledge you feel is present to assess how the factor may affect the survival likelihood of stranded cetaceans.

0=Knowledge is **insufficient**


















5=**Some** knowledge is **present**




10=Knowledge is **complete**

If you feel that you do not have the knowledge to score a particular factor please tick "Don't know"

Don't know

0 1 2 3 4 5 6 7 8 9 10

Feasibility and speed of rescue/re-floatation based on human and equipment resources, location of stranding, time of day, responder expertise and experience and human safety	
Length of time stranded and number of re-strandings	
Weather and environmental conditions, including tides	
Physical injury or trauma caused by stranding	
Animal suffering from illness, disease and underlying health conditions	
Separation from conspecifics/social group	
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Availability of appropriate and timely human intervention and handling, responder training and experience	
Geographical location of stranding and being out of habitat or range	
Effect of species biology on survivorship	
Cause of stranding still present	
Stress, anxiety and associated conditions caused by stranding	
Presence of predators and scavengers	
Difficulty breathing, inhalation of water	
Skin damage and associated pain due to sunburn, dehydration/desiccation occurring when out of water in sun	

Substrate/terrain at the stranding location	
Abnormal movements and reduced limb function	
Animal awareness and neurological status	

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Please tell me about any barriers to assessing how these factors affect survival likelihood.

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In the previous survey I asked you to suggest observable/measurable indicators to assess the survival likelihood of stranded cetaceans. Your responses have been collated into themes. The most commonly mentioned indicators are presented here.

Please indicate the **value** you think each **indicator** has for **assessing** stranded cetacean **survival likelihood**.

Please ensure that you are scoring how good an indication of survival likelihood each indicator is, not how practical these are to measure. A question on ease of measurement for the indicators comes next.

0= **Little**/no value

5= **Some** value















10= **Great** value

If you feel that you do not have the knowledge to score a particular indicator please tick "Don't know"

Don't know

0 1 2 3 4 5 6 7 8 9 10



Signs of physical trauma, injuries and wounds	
Body condition and nutritional status	
Respiration rate and character/effort	
Animal's level of response to stimuli/reflexes as a reflection of its level of awareness, alertness or consciousness	
Animal age based on length/weight and reproductive status	
Measurement of blood parameters and serum/plasma chemistry	
Presence of pod members and social re-integration	
Animal's skin condition such as sunburn, blistering/integrity or desiccation	
Swimming ability and orientation when returned to water	
Length of time stranded and number of re-strandings	
Abnormal movements and behaviours including arching, thrashing, shivering, movements of pectoral and caudal fins	
Signs of illness and disease	
Weather, ambient temperature, sea and tidal conditions	
Availability of resources including equipment	
Number and experience/knowledge of responders	
Distance to animal's natural habitat type	
Core/internal body temperature	
Bleeding/fluids/mucus from orifices	
Species biology and response to stress	

Heart rate and function	
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Regarding the same proposed indicators please indicate how easy/practical each indicator is to measure during a stranding event.

- 0= **Difficult** to measure
- 5= **May be measurable** depending on skills/equipment available
- 10= **Easy** to measure

If you feel that you do not have the knowledge to score a particular indicator please tick "Don't know"

Don't know

0   1   2   3   4   5   6   7   8   9   10

Signs of physical trauma, injuries and wounds	
Body condition and nutritional status	
Respiration rate and character/effort	
Animal's level of response to stimuli/reflexes as a reflection of its level of awareness, alertness or consciousness	
Animal age based on length/weight and reproductive status	
Measurement of blood parameters and serum/plasma chemistry	
Presence of pod members and social re-integration	
Animal's skin condition such as sunburn, blistering/integrity or desiccation	
Swimming ability and orientation when returned to water	
Length of time stranded and number of re-strandings	
Abnormal movements and behaviours including arching, thrashing, shivering, movements of pectoral and caudal fins	
Signs of illness and disease	
Weather, ambient temperature, sea and tidal conditions	
Availability of resources including equipment	
Number and experience/knowledge of responders	
Distance to animal's natural habitat type	
Core/internal body temperature	
Bleeding/fluids/mucus from orifices	
Species biology and response to stress	

Heart rate and function	
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Please tell me about any barriers to measuring these indicators of survival likelihood.

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Please provide any additional comments about survival likelihood here

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