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Extract from:

**Behavioural Culture in Orca (*Orcinus orca*) as a Criterion for Conservation  
Prioritisation**

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**Authors Declaration**

The work presented in this dissertation was carried out in the Department of Geography, Birkbeck, University of London and is entirely my own work except where other authors have been referred to and acknowledged in the text. It has not been previously submitted for a degree in this or any other university. The views expressed in this dissertation are my own, and not those of the university.

*(This contribution to 'A Journey Through Black Geographies' has been slightly modified from the original submission and includes a selected extract from Chapter 5. All rights reserved).*

## 5. Taxonomic classification and ecotype categorisation

Where resources may be limited, ranking species according to extinction risk is crucial as this can prioritise conservation management action (Akçakaya et al, 2000; Cardoso et al, 2011). The IUCN Red List is the most comprehensive global assessment of species extinction risk and can be an effective tool in prioritising conservation efforts (Rodrigues et al, 2006). However ranking species where data is missing is problematic (Akçakaya et al, 2000). The Red List uses a set of criteria to determine whether a species is threatened with extinction based on population size, range, and a quantitative analysis of risk (IUCN, 2012). Species are assigned into one of nine categories, ranging from Not Evaluated to Extinct, with three ‘threatened’ categories – Vulnerable, Endangered and Critically Endangered (IUCN, 2012). Orca, a monotypic species, are listed as Data Deficient (DD) on the Red List and as such do not benefit from a ‘threatened with extinction’ label. Though, in order to effectively manage a population of any species, it is important that it is as adequately and accurately described as possible (Costa et al, 2022). A strong theme found from my research was the difficulty in assigning certain orca populations within the rigid structure of ecotype. It became apparent that the classification of orca populations into ecotypes may not be the most ideal way of categorising orca. This chapter engages with DD classification and the implications this has for conservation prioritisation, as well as issues surrounding orca ecotypes.

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### 5.2 Ecotype; a “topic of confusion”

The North Pacific Residents and Bigg’s are the most widely studied orca in the world from whom much of what is known about orca has been established. Orca ecotype categorisation was developed from the very clear differences between these populations which, though

sympatric, exist completely independently of one another. (Interviewee 4 commented “they’re literally seen bashing each other to get away from each other”). But these ecotypes are very extreme examples of differentiation between orca communities. One participant in particular provided detailed points on the issue of ecotype classification and the inherent inability to accurately categorise all populations into the rigid ecotype structure detailed in Table 1, describing it as a “topic of confusion” (Interviewee 4). However this point was picked up by five additional participants in varying ways.

*“...these North Pacific populations really are the oddball... they’re the exception and everything else seems to be what’s normal.” Interviewee 4*

*“...we’ve [researchers] relied really heavily on this standard in the North Pacific of these two populations that are really genetically divergent, ecologically divergent. And they’ve kind of come up... with this idea of what an ecotype... should be.” Interviewee 4*

As research develops, it is becoming clearer that orca in other areas do not fall into such neatly divided categories as the Residents and Bigg’s (e.g. Best et al, 2004, Baird et al, 2006 and Lauriano et al, 2020). For instance, with the return of large baleen whales and the opportunity for other significant prey resources including seals, orca have returned to Australia and are found in both tropical and temperate regions. Populations existing around Australia are not detailed in Figure 3. It is unclear what ecotype these may belong to, or – importantly – if any (Lauriano et al, 2020). Some populations are relatively distinct, some however were described to me as “soup” – “...offshoot populations that are a... mix of everything” (Interviewee 4). Referring to the morphology of certain orca, Interviewee 4 detailed “...we do have Antarctic-looking ones”, showing the confusion and difficulty in

categorising a population that may visually resemble Antarctic orca but which, by regional definition would not fit into the ecotype. Similarly, García-Cegarra (2022) provide evidence of what they call a “Type A-like” orca in Chilean waters; a dolphin and sea-lion specialist with an eye patch size between that of Type A and Type B, a dorsal cape similar to Type A (i.e. small or non-existent), but with pod sizes similar to those observed in Bigg’s orca. Clearly it would be difficult to neatly categorise this pod of orca, with morphological, prey preference and range differences to all Antarctic ecotypes. Calling this pod ‘Type A-like’, denoting that it does not fit into the Type A category, but it is somewhat similar, adds an air of confusion. As encapsulated by Interviewee 4, “...nothing ever fits perfectly into this distinct bubble.”

Orca around the UK are also an apparently new occurrence, becoming ever more present over the last 50-60 years (although whether due to shifting ranges and new orca in the area, or sea-watching increasing sightings of already present orca remains to be seen). The distinct foraging strategies of Residents and Bigg’s, confirmed by their dentition (sharp teeth – mammal eaters; worn teeth – fish eaters), was used as a basis for classifying North Atlantic orca based on inferred ecological differences when studies first revealed the occurrence of sympatric populations (see Foote et al, 2009). Morphologically, North Atlantic Type 1 orca are expected to have worn teeth, consistent with intake of abrasive fish. In contrast, as mammal hunters, the small population of Type 2 orca are expected to have sharp teeth. However it has been established that the ecology of North Atlantic populations is much more complex (Foote, 2023; Jourdain et al, 2019; Samarra et al, 2018). ‘Type 1’ orca now common around Scotland, with further sightings in England, are witnessed hunting marine mammals including seals and porpoises – potentially ecologically forced as herring stocks in the North Atlantic have previously crashed (Jourdain et al, 2021). Populations as such may be difficult to categorise and there are suggestions for the terms to be retired (Foote, 2023).

*“...there’s this thing that the Transients are meat eaters and the Residents are fish eaters... well, these guys [orca around Scotland] are a bit a [sic] both, aren’t they?”*

*Interviewee 7*

*“...everybody expects our orcas to do exactly the same as all the studies say... our biology’s are maybe very similar, but I think our cultures... are very different. So I find it quite difficult to tick... into a box.” Interviewee 7*

Placing existing orca populations into existing categories established through study of certain groups, which appear to be the exception rather than the rule, is problematic – “a lot’s changed... in the killer whale world, and how we understand killer whales” (Interviewee 4). Terms used to describe populations and ecotypes may thus not be a full and true representation. Even for populations on which this structure is based, changing prey abundance and shifting ranges means descriptions are not particularly accurate. *Resident* and *Transient* labels do not accurately describe the habits of these two ecotypes (Rendell and Whitehead, 2001): “you’re seeing more Transients now than Resident orca... so it’s a bit of a misnomer to call them Residents” (Interviewee 2). Likewise Schorr et al (2022) detail the elusive Offshore are primarily sighted in inshore waters (though they recognise sighting bias). This issue was neatly summed up by Interviewee 4: “...ecotype could really mean everything, and therefore it means nothing.” A more useful system which moves away from assigning populations into the rigid existing ecotype categories would be useful, so as not to obscure important variations between populations (Foote, 2023).

To implement effective orca conservation strategies, whether considering culture as a criteria or not, it is important to have correct and easy to understand information on local orca populations and accurate taxonomy is essential (Costa et al, 2022). Using a small

number of examples of independent orca populations which do not appear to conform to the current ecotype categorisation system, nor the intensely rigid behaviours exhibited by the North Pacific ecotypes, my research depicts how the current method of categorisation may be problematic for conservation:

*“...you have to give them some sort of label, right? Because that’s the only way we can help them. But... how do we make sure that label is both meaningful, and as true as it could be to the population?... [M]aybe something different to ecotypes could be useful for everyone.” Interviewee 4*

Orca taxonomy and categorisation is problematic for a number of reasons, including the difficulty of accessing samples for genetic or other analysis, and conducting research in often harsh environments. One participant detailed they were unsure how current classification could be bettered: “I think... ecotype is quite a nice way of describing them, but I don’t think it works... in terms of protection” (Interviewee 1). It is beyond the scope of this study to suggest how issues of classification and categorisation could be resolved. However this theme became particularly important when raised by participants, such that its importance to conservation is included here as, whether formally recognised or not, the differences between orca necessitates that they are managed differently, a theme discussed further in Chapter 7.