WDCS
Whale and Dolphin Conservation Society

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Endangered and threatened species: Initiation of 5-year review for Southern Resident Killer Whales

Established in 1987, WDCS, the Whale and Dolphin Conservation Society is the only global NGO dedicated solely to the protection and conservation of whales, dolphins and their habitats. We welcome the opportunity to provide comments to the 5-year ESA listing review for southern resident killer whales, or orcas (*Orcinus orca*).

Comprising just three social units (J, K and L pods) the southern resident orca population is 'among the most critically endangered marine mammals occurring regularly or exclusively in US waters' (Reynolds *et al.*, 2009). This population has fluctuated considerably over the past 35 years: all three southern resident pods were reduced during the 1970s due to live captures for marine parks. In 1974, the group comprised 71 whales, peaked at 97 animals in 1996, and then declined to 79 in 2001.

Latest figures from the Center for Whale Research, which closely monitors this population, state that J pod currently numbers 28 members, K pod 19 members, and L pod 42 members, totalling 89 whales: ironically exactly the same number of individuals as when this population received its 'Endangered' listing in November 2005 (Center for Whale Research, February 2010).

Previously designated a depleted stock under the MMPA, the 2005 ESA listing and subsequent Recovery Plan issued by NOAA in 2007 testified to growing concern. The Endangered listing was reached following assessment of this population under Section 4(a)1 of the ESA under the following criteria:

(1) The present or threatened destruction, modification or curtailment of its habitat or range
(2) Overutilization for commercial, recreational, scientific or educational purposes
(3) Disease or predation
(4) The inadequacy of existing regulatory mechanisms
(5) Other natural or manmade factors affecting [the species'] continued existence

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We propose to comment under the relevant headings, as follows:

(1) The present or threatened destruction, modification or curtailment of its habitat or range

A recent paper by Ashe *et al.* (2009) noted that the viability and conservation status of southern resident orcas may be affected by prey limitation and repeated disturbance by human activities. They proposed a candidate marine protected area to mitigate such impacts.

Their research demonstrates that southern resident orcas are most vulnerable to disturbance while feeding. It is, perhaps surprisingly, rare for behavioural data to be incorporated into habitat conservation plans for marine species, but in this instance, it would appear crucial to identify and protect orca feeding hotspots. Ashe *et al.* identified priority habitat by mapping out those areas most used by orcas for feeding. This data, combined with results of interviews with key local environmental educators, allowed them to identify areas which satisfied overlapping 'orca-related' and 'human-related' needs (this latter referring to an area small enough in practical terms for boat traffic to be excluded).

The proposed MPA identified off the south-west side of San Juan Island covers an area 7.4 square nautical miles. Orcas observed within this candidate area were 2.7 times more likely to be engaged in feeding activity than if observed outside this area. Interviews established that an area extending one nautical mile offshore was considered 'manageable' in terms of monitoring and enforcement of the restricted area.

Ashe *et al.* expressed confidence that this high-probability feeding area will endure over time: orcas have been observed in the region for over half a century, and several studies have also reported orca feeding activity in this candidate MPA (eg Heimlich-Boran, 1988; Hoelzel, 1993). Therefore, Ashe *et al.* believe that this preferred feeding area will persist over timescales suitable for management action.

Conclusion: WDCS strongly supports the identification and formal protection of critical habitat for this orca population. Until such time as appropriate formal protection measures are in place, this population will continue to be negatively impacted.

(2) Overutilization for commercial, recreational, scientific or educational purposes
And
(4) The inadequacy of existing regulatory mechanisms

In the final rule announcing the 2005 ESA listing, NMFS identified vessel effects, including direct interferences and sound, as a potential contributing factor in the decline of this population, and the ESA Recovery Plan (2008) includes as a management action the evaluation of current and potential vessel regulations, including consideration of protected areas or time-area closures.

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Research has shown dramatic increases in whale watch traffic (Krahn et al, 2002) such that, during the peak season, this population is typically trailed by as many as 126 vessels at a time, for up to 12 hours per day (NMFS, 2008). Considerable research evidence now exists documenting negative vessel impacts upon cetaceans and other marine mammals, including effects upon feeding, resting and social interactions (for example: Lusseau 2003a; Constantine 2004, Bejder 2006); altering travel patterns to avoid vessels (for example: Constantine 2001; Lusseau 2003b, 2006); relocating to other areas (Allen and Read 2000) and changes in acoustic behaviour (Van Parijs and Corkeron 2001). Research specific to the southern resident orcas has shown that vessel presence causes these animals to adopt more erratic swimming paths (Williams *et al*, 2009b) and reduces the time they spend feeding (Lusseau *et al*, 2009).

Researchers believe that the orcas' feeding ability is compromised by increased ambient ocean noise levels caused by high vessel traffic (Erbe, 2002; Foote, Osbourn and Hoezel, 2004). Vessel noise may mask echolocation clicks, or communication calls used by orcas when group hunting (Bain and Dahlheim, 1994). Research further demonstrates almost 100% masking of orca auditory signals from vessels at 100 yards, with this effect tapering off – although still significant - even from vessels as far away as 400 yards (Holt, 2008). Given that the southern residents are a prey-depleted population, it is absolutely essential to regulate vessels such that masking of orca echolocation and communication is minimised. We are aware of numerous instances of infringement of the current 100 yard restriction, for example by both commercial and recreational fishing vessels.

Conclusion: In January 2010, WDCS input to the NOAA Fisheries Service proposed vessel regulations comment process. At the time, we strongly supported promulgation of this package of regulations (incorporating Alternatives 3, 5 and 7, as described in Subsection 2.2.8, Draft Environmental Assessment, January 2009) which would prohibit vessels from approaching any orca closer than 200 yards; formalise a no-go zone along the west side of San Juan Island, and require vessels to keep clear of the whales' path. This combination of measures would afford the orcas a high degree of protection from vessel strikes, behavioural disturbance and acoustic masking. We note with some disappointment that an extended deadline to this process means that any vessel regulations will not be implemented before spring 2011 at the earliest, therefore the orcas currently remain vulnerable to negative vessel impacts.

(5) Other natural or manmade factors affecting [the species'] continued existence

i) Prey depletion:

Orcas occupy the top position in a complex marine food web. Although orca populations elsewhere will predate on a wide variety of marine species, both the southern and northern resident orca populations feed exclusively on salmon and other fish. Crucially, the Chinook salmon, the preferred food for the southern resident orcas, has been in overall decline for decades. Recently-published research analysing 25 years of demographic data demonstrates that orca survival rates are "strongly correlated with the availability of their principal prey species, Chinook salmon (*Oncorhynchus tshawytscha*) and although these killer whales may consume a variety of fish species, they are highly

specialised and dependent on this single salmonid species to an extent that it is a limiting factor in their population dynamics." (Ford *et al.*).

Ideally, Chinook would compose around three-quarters of the diet of southern resident orcas and data demonstrates that the fortunes of Chinook salmon and orcas populations are intimately connected; for example, when Chinook populations declined sharply (as they did in the 1990s), the southern resident population also crashed. In 2008, eight members of this population (including two females of reproducing-age) disappeared, feared dead due to malnutrition, starvation and consequent vulnerability to other threats including water contamination.

Orcas develop specialised hunting strategies over time, learning from pod elders. Deeply-engrained cultural traditions thus play an important role in foraging behaviour. Therefore, although the southern residents hunt other fish when Chinook aren't available, they may fail to receive sufficient nutrients from smaller, less oil-rich or harder-to-catch fish species leading to malnutrition and greater vulnerability to disease, etc.

Conclusion: WDCS strongly supports measures to conserve and restore salmon populations and revitalise salmon runs along the entire western seaboard of the US and Canada, from California to Alaska. This may include specific measures such as dismantling the four lower Snake River dams, which currently prevent Chinook salmon from reaching their spawning streams and keep the salmon smolts from reaching the ocean. Urgent consideration should also be given to limiting further construction or farming activity in watersheds and wetlands and instead, to restoring these areas. The findings of Ford *et al.* also strengthen the case for imposing additional limits on salmon fishing (particularly Chinook) in the region. Whilst efforts are undoubtedly being made on this front under the Recovery Plan, it is clear that these have not yet succeeded in reversing the southern resident orca population's decline.

ii) Toxic pollution:

Pollutants dumped in Puget Sound and other waterways especially during the 1960s and 1970s increased orca deaths and reduced fertility, rendering the southern resident orcas amongst the most contaminated marine mammals in the world. Polychlorinated biphenals (PCBs) and other organic chemicals like DDT and persistent aromatic hydrocarbons (PAHs) have leached into the marine ecosystem and moved through the food chain. Over decades, these contaminants have accumulated in the orca's blubber layers, reducing fertility and increasing mortality rates. Although researchers documented the arrival of six new calves last season, celebrations were somewhat muted due to the knowledge that as many as 50% of calves – particularly first-born - do not survive their first year. These high mortality rates are blamed upon heavy toxic burdens transferred from the calf's mother.

Conclusion: WDCS supports ongoing efforts to reduce toxic pollution and improve water quality, whilst noting that it could be many years before this orca population recovers from decades of swimming in contaminated waterways.

In summary then, the southern resident orcas have been impacted in recent decades by a multiplicity of factors including prey depletion, noise and chemical pollution, vessel interference, habitat degradation and the legacy of extensive live-captures during the 1970s.

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Today, the population numbers 89 individuals – exactly the same as when the ESA 'Endangered' listing was announced in 2005. Given the enduring nature of almost all of these threats, it is difficult to make a case for lifting the Endangered designation and indeed WDCS strongly calls for such listing to remain in place.

Yours sincerely,

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