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Scottish saline lagoons: Impacts and challenges of climate change

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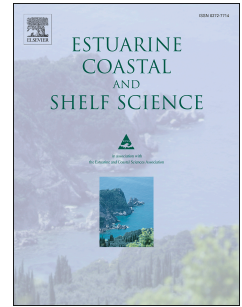
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1 **Scottish saline lagoons: impacts and challenges of climate** 2 **change**

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9 **Abstract**

10 The majority of Scotland's saline lagoons are located on the low-lying coastlines of the
11 Western Isles and the northern archipelagos of Orkney and Shetland, where recorded annual
12 relative sea level rise rates are among the highest in Scotland. The sediment-impounded
13 lagoons of Orkney and Shetland will either lose their impoundment and become incorporated
14 in marine coastal waters, or become increasingly saline, as relative sea levels rise. The rock-
15 basin lagoons of the Western Isles will retain their restricted exchange with the sea but will
16 also become more saline with rising sea level. Specialist lagoonal organisms tend to have
17 wide salinity tolerances but may succumb to competition from marine counterparts. In all
18 areas, there are sufficient fresh-water inland water bodies with potential to be captured as
19 lagoons to compensate for loss of extent and number, but the specialist lagoon biota tend to
20 have limited dispersal powers. It is thus possible that they will be unable to transfer to their
21 analogue sites before existing lagoons become fully marine, giving conservation managers
22 the problem of deciding on management options: leave natural processes to operate without
23 interference, manage the saline inflow to maintain the current salinity regime, or translocate
24 lagoon organisms perceived as threatened by rising salinities. Timing of conversion and
25 capture is unpredictable due to local topography and complications caused by variable
26 stratification.

27 **Keywords:** Conservation; Salinity effects; Sea level changes; Outer Hebrides; Orkney

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