

Peter Dennis

Greenland White-fronted Goose dietary plant selection and nutritional value during winter

Introduction

Wintering Greenland White-fronted goose (GWfG) populations were studied at the Dyfi estuary & Ynys Môn, Wales and North Slob, Wexford, Ireland, winters 2020-21, 2021-22 and 2022-23. The aim was to investigate whether the availability or quality of vegetation could explain the acute decline in winter populations observed at these southern most wintering grounds.

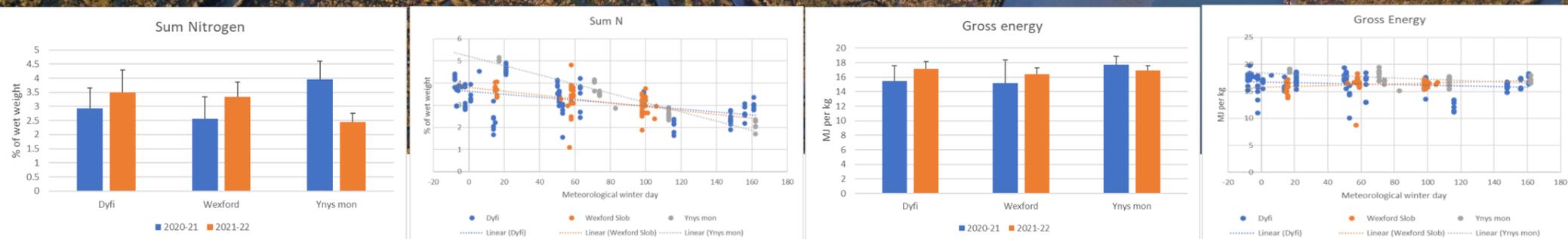


Methods

GWfG were watched and locations mapped in early, mid and late winter. Nocturnal fieldwork located and sampled the distinct faecal pellets at the mapped locations (n=1560), and plant material from associated, grazed lawns (n=390). DNA was extracted from faecal material and DNA metabarcoding used to determine the dietary plant species. Biochemical analyses were applied to green leaf material once dried and milled, to quantify nutritional value. During June to August 2021, botanical survey was conducted in 194 quadrats stratified into areas currently grazed, historically grazed and not recorded as ever grazed by GWfG.

Results and Preliminary findings

As examples, analyses of Nitrogen and gross energy values are illustrated by case study site and 2020-21 or 21-22 winter. The GLM analysis included day of meteorological winter as a covariable (Nitrogen: Year F=0.30, NS; Site F=4.02, P<0.02; Met winter day F=72.1, P<0.001. Gross energy: Year F=4.34, P<0.05; Site F=10.88, P<0.001; Met winter day F=0.10, NS). % of wet weight Nitrogen but not Gross Energy (MJ kg⁻¹) declined throughout winter and there were small differences between sites for both parameters.



Plant species detected in GWfG faecal material with DNA metabarcoding, (illustrated with Dyfi estuary data) are indicated with asterisks against species on the species-rank plots (average abundance per quadrat). These dietary plant species appear to be well represented amongst the abundant species within quadrats across all three stratified categories. The % cover of all dietary plants present in each quadrat was summed and the geographic location overlaid on the NRW flood risk map. That illustrates current risk of flooding of these winter grazing areas (light, mid and dark green: low, medium and high risk flooding from the sea). Dietary plants occurred widely in quadrats so disturbance may restrict GWfG grazing. Better sites occupied areas at medium risk of flood with brackish water.

