

Ecological impact of transhumance on the trophic state of alpine lakes in Gran Paradiso National Park



Transhumance – the summer transfer of livestock to highland pastures – is a traditional practice in the European Alps and is considered an integral part of the mountain ecosystem. Mountain lakes are generally oligotrophic systems and are particularly sensitive to the nutrient input caused by livestock. The aim of the present study was to quantify the impact of livestock grazing on the trophic state of high-altitude lakes in an area where transhumance is a traditional practice (Gran Paradiso National Park, Western Italian Alps), taking into account its dual value of ecosystem component and potential threat to lakes' trophic status. The impact of flocks and herds grazing was estimated on sensitive parameters related to the trophic state of alpine lakes: water transparency, nutrient content, bacterial load and chlorophyll-a concentration. Transhumance produced a significant increase in the trophic state of lakes with high grazing pressure, but little or no effect was found at soft-impacted lakes. Even though heavy-impacted lakes represent a minority of the studied lakes (three out of twenty), we indicated conservation measures such as fencing, wastewater treatment and livestock enclosure to be tested in Gran Paradiso National Park.

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