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Vegetation cover, avoided erosion and water quality in high Andean wetlands, Yeso River Basin

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Wetlands on the high Andes mountains near Santiago de Chile have been impacted by overgrazing and off-road tourists.

We studied wetlands in El Yeso River basin. In February 2015 we established 36 exclusions and measured vegetation cover and height, biomass production in and out the exclusions starting in October. Water and undisturbed soil samples were collected. Data were analyzed statistically to estimate i) the recovery of vegetation, and ii) the influence of grazing and vehicle traffic on vegetation loss, and iii) impacts on soil and water quality.

In areas with less intense traffic, the difference in vegetation coverage in and out the exclusions is 22% (± 11.4%); in areas with more intense traffic this difference is 16% (± 16%). Height of vegetation, in the less intense traffic areas, ranges from 6.25 cm (± 2.8) to 13.32 cm (± 6.3). With higher traffic it varies between 6.9 cm (± 3.1) and 13.6 cm (± 5.4). Biomass varies between 0.06 kg DM/m2 to 0.57 kg DM/m2 depending on botanical composition and date.

After water circulates through the wetlands its content of nitrogen increases 37.33% to 0.37 mg N/l and the fecal coliforms 66.67% to 0.67 MPN/100 ml, because of cattle. On the contrary, turbidity decreases 20.67% to 0.21 UNT because sediments are captured by vegetation. We also estimated an avoided erosion rate, ranging between 1.23% and 31.87% (depending on the slope) due to the increase in coverage within the exclusions.