Distribution of Plants at Mer Bleue

BIO1130 Section C9

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Question Responses:

1. Based on the observations plotted graphically, the *Vaccinium myrtilloides* has acquired the most robust adaptation to the ecotone habitat. This indicates that it conforms best to transition zones between the bog and marsh environments where the soil is moist.

2. a) If partial water drainage of the Mer Bleue marsh occurred then the total water supply of the ecotone, and thus the moisture in it's soil, would decrease by approximately ¼ and the habitat would become much drier. This is because the ecotone is a transition zone between both the marsh and the bog, and although it would still receive the same amount of water from atmospheric precipitation (equivalent to about ½ of the total supply), it's accumulation from the marsh would be cut in half. This would reduce the overall biodiversity of both the faune and flora in the habitat.

2. b) If partial water drainage of the Mer Bleue marsh occurred, then a lack of sufficient moisture for survival would result in a void of the *Vaccinium myrtilloides* in the ecotone. Since this habitat is elevated above the marsh, a decrease in water level would prevent the roots of this plant from being able to reach moist soil; atmospheric precipitation would therefore be the only water supply to the soil (and correspondingly, the plant). While the distibution of the *Vaccinium myrtilloides* in the bog would also decrease, it would not lack completely since it's elevation is more level with the marsh. Subsequently, while the water supply would still be reduced, the bog would have a moisture level similar to what the ecotone currently does and as observed, this moisture level is favoured by the *Vaccinium myrtilloides*. Distribution of this plant at all other sites would remain unchanged.

This consequence is probable since the ecotone is established at an elevation considerably higher than the marsh. Thus, if water drainage occurred then the only source of moisture for the

soil would come from atmospheric precipitation. The abundance of this plant in the bog would also decrease but it would not conclude in a complete void; since the bog is at an elevation which is more level with the marsh

If partial water drainage of the Mer Bleue marsh occurred, then it's abundance in the ecotone would decrease since there would be a lack of sufficient moisture for survival. Resultantly, it's abundance in the bog would also decrease (since this habitat also gets about half of its water from the marsh). Accordingly, there would still be no distribution of the *Vaccinium myrtilloides* in the marsh, but due to the change in selective pressures of the environment it would adapt to be able to live in the drier forest and field sites and thus would have a greater distribution in these areas.

- Bog still has some access to water-and was intially already slightly more moisture so overall effect would be less than ectone, ecotone was a little bit higher level and therefore if the water in the marsh drained it would likely no longer get water from thr marsh anymore (and it's only mositure supply would be the precipitation). This would result ina major decrease and probably wipe the amoutn out completely here.
- Bog would decrease but not be wiped out completely (not bone dry) and would have current moisture level that current ecotone does have
- Dont include adapting to others
- Ecotone currently close enough bt wouldnt be after

- Moisture -moderate level of moisture (both rain and the marsh/1/2) for first question
- Fix format -italisized
  I

Figure 1: Incidence of _____ acorss a moisture gradient of different habitats in mer bleau. This moisture gradient is demonstarted from driest to most moist.

Incidence of *Vaccinium myrtilloides* across a moisture gradient of the five different stations at Mer bLEU conservation area. This mpisture gradient orders the stations from the most dry to the most moist. Observations were taken by five groups ranging in size from 24 to 39 people. The incidence is calculated by the number of observations divided by the size of each respective group. The subscript above certain data points demonstartes the amount of groups which made observations at the same incidence

For figure:
Obervsations were taken by 5 gpup sizes 24-36
Number of observations divded by group size
The superscript above respective data points the amount of gorups made same observations at this incidence
For graph:

Max incidence 0.25- make this the top (leave one or two millimetres above)
3,4, or 5 tick makrs
Station 1

***fix formatting for second question, change third question

what is your prediction regarding the consequence of the drainage on your plant regarding **its abundance in its preferred habitat** as well as its distribution in the Mer Bleue site??-adapt to the forest ???-would also decrease in the bog-marsh still would be too wet.

Would it be cut in half if it's raised?? Or no?? Should i say how much it will decrease graph???

In these habitats, the saturation of sphagnum moss with water impedes the passage of air which results in a lack of oxygen and minerals and highly acidic conditions; thus,

The bog receives most of its water in the form of atmospheric precipitation. Flow velocities of ground and surface waters are very low given the impermeability of the underlying clay soils, the absorption qualities of sphagnum and the presence of numerous beaver dams. Shoreline stabilization is not a significant concern as the impact of water on the ridges is minimal and most of the land is relatively flat.

he adsorption capacity of the transition zone offers significant protection against pollution by toxic substances, including heavy metals and toxic organic chemicals (primarily pesticides originating from agricultural activities). The ratio concentration of heavy metals or pesticides in organic matter to its concentration in water at equilibrium is strongly dependent on the composition of the organic matter and the presence of complex forming ligands. It is usually between 50 and 5000, indicating that the transition zone has an enormous binding capacity for these pollutants.

Ecotones serve as a buffer zone not only for pollutants, but also for biological species present in adjacent ecosystems. Thus, preservation of wetlands at the lakeshore may be crucial for maintenance of the biodiversity in lake ecosystems—a function that a manager should not overlook in developing an appropriate lake management strategy.

https://www.sciencedirect.com/topics/earth-and-planetary-sciences/ecotone
A lagg is an ecotone: a transition or tension zone between two adjacent plant communities evidenced by a relatively sharp change in plant species composition in space (Gosz and Sharpe 1989; Groenveld
Since sharp changes in hydrology, chemistry, and species composition may occur across an ecotone (Gosz 1992), these landscape forms are often high in biological diversity and productivity (Risser 1995). The diverse species composition of lagg zones may thus be an important element in regional biodiversity.
https://research.vu.nl/ws/portalfiles/portal/3061449/277925.pdf

Biodiversity (both faune and flora)

https://www.britannica.com/science/bog-wetland

https://www.britannica.com/science/community-ecology/The-process-of-succession#ref588108
https://www.britannica.com/science/bog-wetland

The saturation of the moss with water retards passage of air, so that parts of a mass of *Sphagnum* more than a few inches from the surface are usually anoxic. The combination of lack of oxygen, lack of minerals, and highly acid condition greatly retards the action of bacteria and fungi, the usual decay organisms

(say which one more so-say “although there are instances in the forest…” ask-mention forest?)

Based on the observations plotted on your graph, what type of habitat(s) is your plant adapted to?