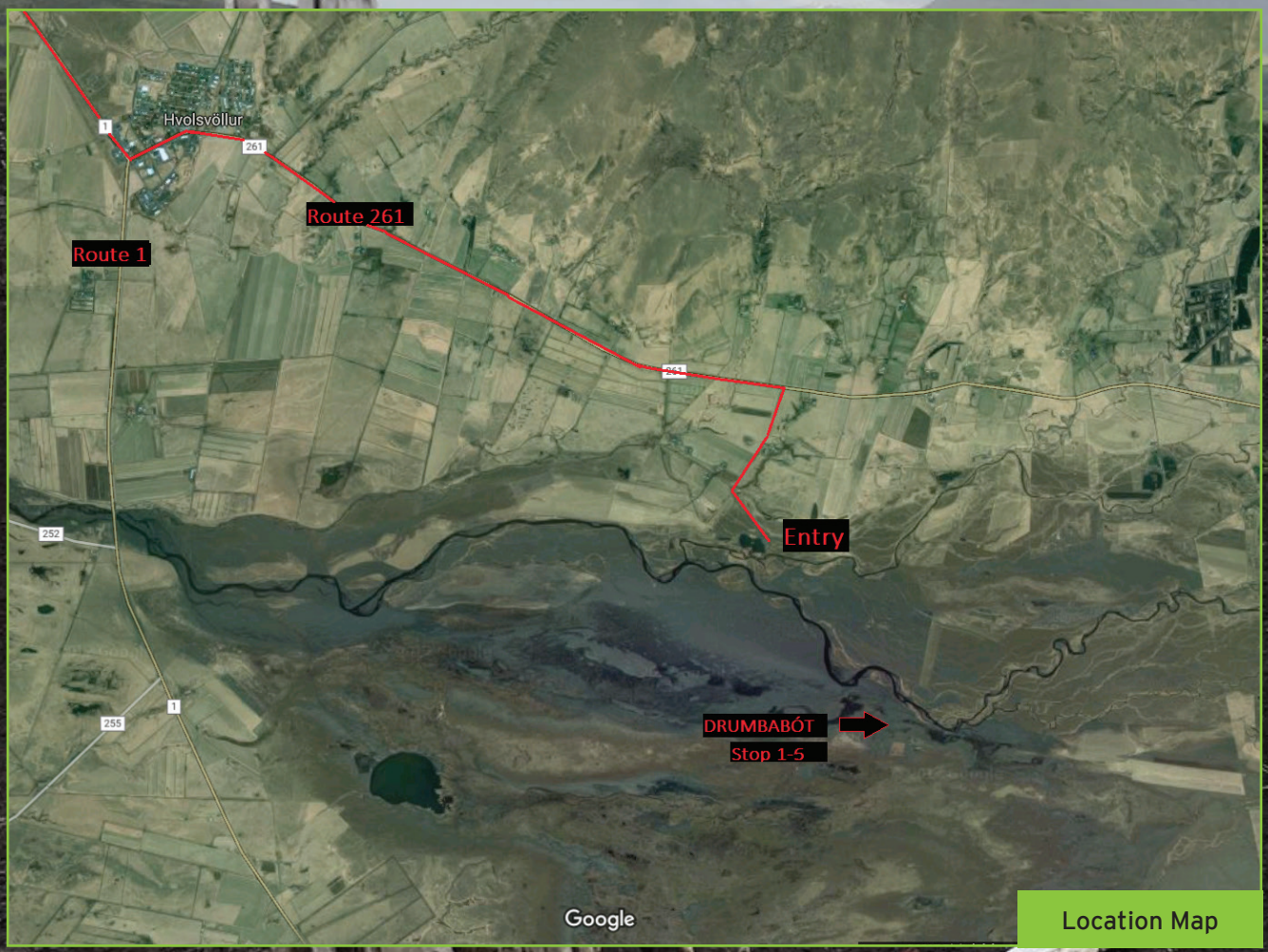
Drumbabót

Teacher's Sheet



Visit Time: 2–3 hours

Drumbabót shows the remarkable and well-preserved remnants of an ancient forest. The area is characterised by a high density of birch (Betula pubescens) trunks that stand out of the gavel/sand 20-60 cm tall, all leaning to the south west.



Location Map

Teacher's Notes

SUGGESTED STOPS	POINTS TO NOTE
Parking and access:	Coming from Reykjavik, take route 1, the ring-road and drive eastward towards Hvolsvöllur. The distance from Reykjavik to Hvolsvöllur is 100 km. Drumbabót is a well-defined geosite. From Hvolsvöllur village on ring-road 1, take the turn to road no. 261 towards the Valley of Fljótshlíð. This area is a historic setting of the Viking settlers whose story has been artistically conserved in the saga of Brennu-Njáll. Before venturing too far along the road no. 261, follow the sign to the right for Drumbabót, where crossing the unbridged river of Þverá is necessary. Stops 1-5 are all located within the Drumbabót area with no specifically assigned locations.
1	This stop provides a good view of the flat area and the looming mountains in the distance. Katla is a part of the Eastern Volcanic Zone (EVZ) and is one of the largest central volcanoes in Iceland, covered by the Mýrdalsjökull ice sheet. Subglacial eruptions inside the caldera of Katla are the most common type of eruption from the volcanic system. Eruptions that occur beneath the glacier cause floods, jökulhlaup. The most recent to burst out from Katla to the west is believed to have wiped out a birch forest here in the lowlands in 822-23 AD. Given the distance of 45 km to the perimeter of Mýrdalsjökull, one can assume the flood was of enormous proportions. The Drumbabót area is thus part of an ancient floodplain of Katla's glacial outbursts, and due to the nature of jökulhlaup flooding (consisting of water, ice and volcanic sand/ash, 20-80), the finer materials spread further, over a large area, creating a very flat topography.
2	In total, research shows that 11-14 glacial floods have come down the Markarfljót flood plain in the last 9000 years, the last one of which was likely to have completely devastated this once thriving forest. Vegetation on this grazed tundra resembles wet moorland and the soil is mostly glacial sediment gravel/ fluvial remains with the stumps rooted in a 40-70 cm thick sandy-peat soil layer. Little organic material is found within the overlying sediments. Taking into account erosion from wind, rain and seasonal melts, all of which washes the organic matter out of the course soil, it makes the area quite inhospitable for vegetation. Where organic material is present, vegetation is most prominent. Farmers have been actively revegetating the area with fertilizers in the last decade. Today the area is subject to light sheep grazing.
3	Drumbabót is a 100-ha area where the remains of an ancient birch forest are visible. These remains have been exposed due to weathering and river erosion over the last century. This desert-like area contains the last vestiges of what may have been a 2,000-ha birch forest that flourished between 755-830 AD. 100-ha of battered 1,200-year-old tree stumps are all that remain of a dense forest that may have contained 500-600 mature trees (per hectare). Before settlement in the late 9th century, trees are believed to have covered the land from the mountains to shore. To make way for grazing and agriculture, settlers burned forests and chopped them down for burning and metal work. It is estimated that more than half of all forested areas have vanished since settlement. Birch forests are believed to have covered as much as 32.000 km2 at settlement but have since been nearly cleared within 250 years.

4	An outwash is a deposit of sand and gravel carried by running water from the melting ice of a glacier. Drumbabót is part of an ancient floodplain of Katla's glacial outbursts (jökulhlaup). They occur regularly, with larger bursts happening less frequently, changing the landscape where the water carries enormous boulders and ice-blocks along with immense amounts of mixed sediments towards the coastline. An outwash plain is a deposit of sand and gravel carried by running water from the melting ice of a glacier. The grain size tends to be coarser nearer the glacier, with the finer grain sizes spreading over greater distances. The river Þverá, a spring fed river, tends to swell during autumn and winter, sometimes well beyond the banks of the river. Being a spring river, it is calmer than its glacial relative Markarfljót, that used to meander in these parts, but gets occasional glaciar meltwater mixing with the river, further increasing its energy and changing the landscape. The amount of fluvial sediments in the river effects the shape and formation. With decreasing energy, the river carries less, the coarsest materials start settling in the calmer areas, building up and along with river erosion, it results in the continuous evolution of the river path. The coarseness of the river bed, the fluctuating water level and the poor cohesion of sediments in river banks all contribute to shaping the path of the river.
5	Scientists have measured the age of the tree stumps by taking slices of stumps for growth- and annual ring analysis. The results gave a life-age estimate of 60-100 yrs. at the time the trees perished. Another study showed with radiocarbon analysis that one of the trees was 76 yr. old when buried, confirming other age estimates. Measurements give evidence that the trees all died simultaneously, the annual rings closest to the bark formed in the same year for all trees examined. The trees are all "in situ", the roots sitting in sandy histosol (sand mixed swamp-like soil) that is about 50-70cm in thickness, below that is a layer of gravel. Above both sits around 50cm of sandy sediments, likely deposited by the most recent jökulhlaups and glacial river deposits.