

## Gweedore Bay Island GWB Group September 2005

### Gweedore Bay and Islands Group: Summary of Initial Characterisation of GWB.

Hydrometric Area Local Authority	Associated surface water features	Associated terrestrial ecosystem(s)	Area (km <sup>2</sup> )
Donegal Co Co	<b>Lakes:</b> Scalpachore, Nareliea, Inishsirrer, Magheramaga <b>Streams:</b> virtually no streams.	Coastal Lagoons, salt meadows, machairs, dune slacks. (O'Riain, 2004).	~ 5
<b>Topography</b>	Gweedore Bay and Islands GWB Group consists of all the islands in Gweedore Bay and Inishfree Bay. Given that they comprise locally groundwater dependent terrestrial ecosystems, similar geology and geomorphology the islands are characterised as one GWB group. Gola and Cruit are the largest islands. The population of Cruit is recorded at 61 people (Census 2002). Elevations range from 0-20 mAOD.		
<b>Geology and Aquifers</b>	<b>Aquifer categories</b>	The main aquifer category is: <b>PI:</b> Poor aquifer which is generally unproductive except for local zones.	
	<b>Main aquifer lithologies</b>	The islands are composed of the Thorr Granite.	
	<b>Key structures</b>		
	<b>Key properties</b>	There are no data available. Low transmissivities are expected. Storativity is expected to be low (<0.5%). The data are inadequate to calculate groundwater gradients, however, these are expected to be greater than 0.01.	
	<b>Thickness</b>	Most groundwater flux will be in the uppermost part of the aquifer.	
<b>Overlying Strata</b>	<b>Lithologies</b>	Till, wind blown sand and outcropping rock are present.	
	<b>Thickness</b>	1-3m (Donegal Groundwater Protection Scheme).	
	<b>% area aquifer near surface</b>	<i>[Further Information to be added at a later date]</i>	
	<b>Vulnerability</b>	Extreme vulnerability (Donegal Groundwater Protection Scheme).	
<b>Recharge</b>	<b>Main recharge mechanisms</b>	Diffuse recharge is expected to occur via rainfall percolating through the subsoil and rock outcrops.	
	<b>Est. recharge rates</b>	<i>[Information to be added to and checked]</i>	
<b>Discharge</b>	<b>Large springs and large known abstractions (m<sup>3</sup>/d)</b>	None known.	
	<b>Main discharge mechanisms</b>	Shallow groundwater is likely to discharge mainly to the small lakes, or to seeps along the coastline, but the limited bedrock transmissivity means that the baseflow component of the total streamflow will be low.	
	<b>Hydrochemical Signature</b>	No data are available within this particular GWB.	
<b>Groundwater Flow Paths</b>		Groundwater flow is expected to be concentrated in fractured and weathered zones and in the vicinity of fault zones. Flow paths are likely to be short (30-300 m) with groundwater discharging rapidly to the lakes, or to seeps along the coastline. Groundwater flow directions are expected to follow topography.	
<b>Groundwater &amp; Surface water interactions</b>		Shallow groundwater will discharge locally to the small lakes, small springs and seeps. Owing to the poor productivity of the aquifers in this body it is unlikely that any major groundwater - surface water interactions occur. Baseflow is likely to be relatively low.	
<b>Conceptual model</b>	<ul style="list-style-type: none"> <li>• The group consists of all the islands in Gweedore and Inishfree Bay.</li> <li>• The GWB is composed of low transmissivity rocks.</li> <li>• Groundwater flow is expected to be concentrated in fractured and weathered zones and in the vicinity of fault zones.</li> <li>• Diffuse recharge is expected to occur via rainfall percolating through the subsoil and rock outcrops.</li> <li>• Flow paths are likely to be short (30-300 m) with groundwater discharging rapidly to the lakes, or to seeps along the coastline.</li> <li>• Flow directions are expected to follow topography.</li> <li>• It is unlikely that any major groundwater - surface water interactions occur. Baseflow is likely to be relatively low.</li> </ul>		

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<b>Attachments</b>	Figure 1.
<b>Instrumentation</b>	<b>Stream gauges:</b> None <b>EPA Water Level Monitoring boreholes:</b> None <b>EPA Representative Monitoring points:</b> None
<b>Information Sources</b>	Lee M. and Fitzsimons V. (2004). <i>County Donegal Groundwater Protection Scheme</i> . Main Report. Draft Report to Donegal County Council. Geological Survey of Ireland 58pp. Long, C.B. & McConnell B.J. (1997) <i>Geology of North Donegal: A geological description to accompany bedrock geology 1:100,000 scale map, Sheet 1 and part of Sheet2, North Donegal</i> . With contributions from P. O'Connor, K. Claringbold, C. Cronin and R. Meehan. Geological Survey of Ireland. 87pp. O' Riain, G., (2004). <i>Water Dependent Ecosystems and Subtypes Draft Report</i> . WFD Support Projects. Compass Informatics in association with National Wildlife and Parks Service (DEHLG).
<b>Disclaimer</b>	Note that all calculation and interpretations presented in this report represent estimations based on the information sources described above and established hydrogeological formulae.

Figure 1. Gweedore and Inishfree Bay.

