

Castlereia Bellangare GWB: Summary of Initial Characterisation.

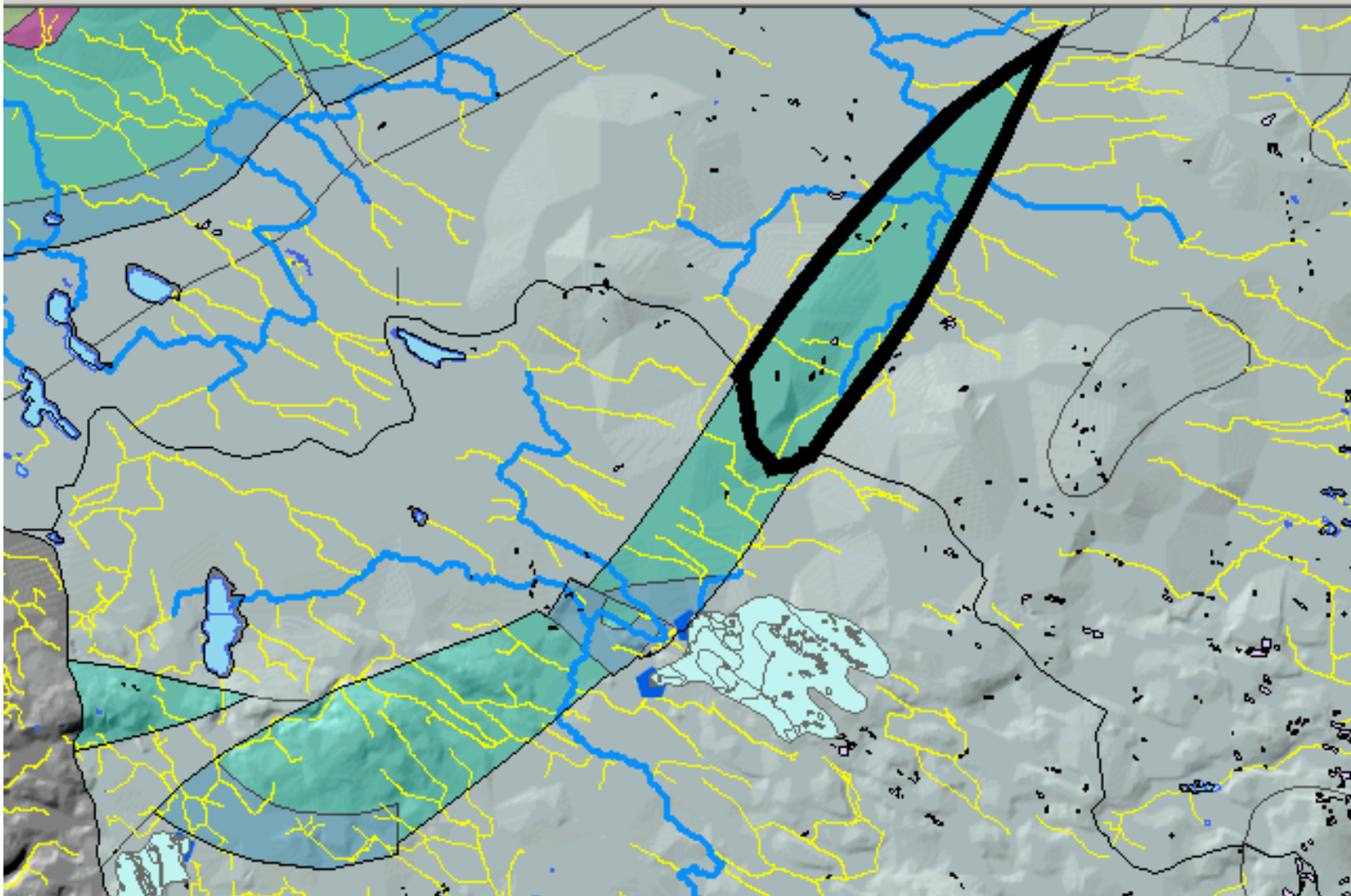
OUTSTANDING ISSUES – in the low vulnerability areas in the vicinity of the rivers likely to impede discharge to rivers– subsoils of up to 18m. what to say about GW SW interactions

Castlerea Bellangare GWB: Summary of Initial Characterisation.

Hydrometric Area Local Authority	Associated surface water features	Associated terrestrial ecosystem(s)	Area (km ²)
26 – Shannon Upstream Roosky Roscommon Co. Co.	Rivers: Oweenaforeesha; Carricknabraher; Breedogue	Ballanagare Bog (000592), Cloonshanville Bog (000614); Ardagh Bog (001222)	24
Topography	The body occupies a northeast southwest trending area in County Roscommon with Bellanagare at its center. The topography is subdued with gentle slopes. A large percentage of the area is covered by boggy ground. The highest ground is in the southwest of the body where there is a topographic high and a catchment boundary between the Suck and the Shannon Upstream Roosky catchments at Brackloon. The highest point is approximately 130 m. The ground slopes gently to the southeast towards the river valley of the Oweenaforeesha River which flows northeast to Bellanagare. The lowest ground is 60-70 mAOD in the northeast of the body where Oweenaforeesha and Carricknabraher rivers join to become the Breedogue which flows northwards out of the body.		
Geology and Aquifers	Aquifer categories	LI: Locally important bedrock aquifer that is productive in local zones;	
	Main aquifer lithologies	Dinantian Mixed Sandstones, Shales and Limestones	
	Key structures	The Dinantian Mixed Sandstones, Shales and Limestones rock unit (Boyle Sandstone Formation), which comprises this groundwater body, occurs as part of an inlier in surrounding Dinantian Pure Bedded Limestones. The inlier consists of a fault bounded strip trending northeast southwest. The unit dips south southeast.	
	Key properties	No data on hydrogeological properties specific to this groundwater body are available. Transmissivities ranging from 2-76m ² /d have been recorded in the Boyle Sandstone (Dinantian Mixed Sandstones, Shales and Limestones) with a median value expected to be in the lower end of the range. Dinantian Mixed Sandstones, Shales and Limestones are not considered to be major aquifers although local zones of enhanced permeability occur.	
	Thickness	In general, the effective thickness of this aquifer is likely to be not more than 15 m, comprising a weathered zone of a few metres and a connected fracture zone below this, although deeper flow can occur in areas which have undergone a higher degree of structural deformation and faulting.	
Overlying Strata	Lithologies	<i>Shallow Rock (Rck); Cut Peat (Cut); Sandstone Till (TDSs) [Information to be added at a later date]</i>	
	Thickness	<i>Subsoil is thinnest in the southeast of the body being generally less than 3 m thick on the higher ground that lies between the rivers Oweenaforeesha and Carricknabraher. In the low-lying river valleys, subsoil depths of up to 18m have been recorded. There are a few small areas where outcrop is recorded. [Information to be added at a later date]</i>	
	% area aquifer near surface	<i>[Information to be added at a later date]</i>	
	Vulnerability	Areas of Extreme vulnerability occur on the higher ground in the southeast of the body and a small area northwest of Bellanagare. Narrow areas of High vulnerability skirt the areas of Extreme vulnerability. Areas of Moderate and Low vulnerability occur in the lower lying river valley areas, particularly in the northeast of the body	
Recharge	Main recharge mechanisms	Recharge is diffuse. Most of the recharge is likely to occur on the higher ground in the southeast of the body where the subsoil thickness is thinnest.	
	Est. recharge rates	<i>[Information to be added at a later date]</i>	
Discharge	Springs and large known abstractions (m ³ /d)	Deerpark (Ballanagare) GWS ROS57 (4m ³ /d) - EPA list of groundwater sources (March 2002). <i>[More information to be added at a later date]</i>	
	Main discharge mechanisms	Groundwater will discharge to the rivers and streams that cross the groundwater body. As the rock units in this body are of relatively low permeability and the subsoil thicknesses greatest in the river valleys baseflow is expected to be generally low. There may also be some discharge to the surrounding karstified Carrick-on-Shannon GWB.	
	Hydrochemical Signature	No relevant hydrochemical data are available in this GWB for assessment. Groundwater in the Dinantian Mixed Sandstones, Shales and Limestones has a calcium–bicarbonate signature. The Dinantian Mixed Sandstones, Shales and Limestones rock unit of this groundwater body, (Boyle Sandstone Formation) is calcareous.	

<p>Groundwater Flow Paths</p>	<p>These rocks are devoid of intergranular permeability; groundwater flow occurs in faults fractures and joints. Groundwater flow will be of a local nature. While local zones of enhanced permeability will occur these zones will generally be isolated from each other limiting the development of regional flow systems. Groundwater flow paths will be short, in general between 30 and 300 m, with groundwater discharging to streams and rivers. Groundwater flow will generally be concentrated near the top of the rock, however deeper inflows can occur. The Dinantian Mixed Sandstones, Shales and Limestones of this groundwater body act as a barrier to flow of groundwater from the Pure Bedded Limestones surrounding the body. Overall, general flow directions within the body will be in a southeasterly direction away from the somewhat higher ground in the southeast towards the river valley of the Owenaforeesha, and in the north and northeast of the body generally in the direction of the Breedoge River.</p>
<p>Groundwater & Surface water interactions</p>	<p>The rock units in this body are of moderate to low permeability and baseflow to rivers and streams is likely to be relatively low. The thick low permeability subsoil in the river valleys would also act to impede baseflow to the rivers. There are two NHA sites which are partially contained within the body (and partly within the Carrick-on-Shannon GWB) that are considered on initial review of their site synopses to be have some dependency on ground water - Cloonshanville Bog and Bellanagare Bog. The NHA site synopsis of Cloonshanvill Bog states: "Cloonshanville Bog is located approximately 2 km east of Frenchpark. The eastern boundary of the site is the Breedoge River, the southern the Frenchpark/Elphin road. The bog developed in a shallow basin in a groundwater discharge zone. The regional watertable has been lowered, but evidence of groundwater inputs are seen on and around the high bog.... a large raised bog.... A large flush area occurs in the centre of the bog dome. The main body of the flush supports an extensive area of bog woodland.....". Bellanagare Bog straddles the catchment boundary which forms the southeastern boundary of the body. It is described as a western, or intermediate, raised bog, showing as it does features of both raised bog and blanket bog. The surface of the bog is undulating and the peat is concentrated on ridges, with flushes occurring in between. Bellanagare Bog is notable for the range of flush types found, which includes a swallow hole flush. Another bog, Ardagh Bog also occurs within the body. However, a site synopsis report was not available at time of writing this summary. Further information is required to determine the exact nature of the groundwater-surface water interactions in this body.</p>
<p>Conceptual model</p>	<ul style="list-style-type: none"> • This roughly wedge-shaped northeast-southwest trending groundwater body is bounded on all sides except for the southwest by the contact with surrounding Dinantian Pure Bedded Limestones that are part of the Carrick-on-Shannon GWB. The southwestern boundary is marked by a topographic high which forms the catchment boundary between the Suck and the Shannon Upstream Roosky catchments (and the boundary with the Castlerea GWB). • A large percentage of the area is covered by boggy ground. The body includes low-lying areas in the river valleys and an area of somewhat higher ground in the southeast of the body. • The groundwater body is composed of a single rock type, the Boyle Sandstone (Dinantian Sandstones, Shales and Limestones), which is a relatively low permeability rock with local zones of enhanced permeability. • Groundwater flow will be concentrated in fractured and weathered zones and in the vicinity of fault zones. • Recharge will occur diffusely through the subsoils and via outcrops, primarily in the higher ground in the southeast where the subsoil is thinnest. • Groundwater within the body is generally unconfined. Most flow will occur near the surface of the rock. The effective thickness of the aquifer is likely to be not more than 15 m, comprising a weathered zone of a few metres and a connected fracture zone below this. Groundwater flow will be of a local nature. Flow path lengths will be relatively short, and in general are between 30 and 300 m. Local flow directions are controlled by local topography. Overall, groundwater flow will tend to be in a southeasterly direction away from the somewhat higher ground in the southeast towards the river valley of the Owenaforeesha. In the north and northeast of the body, flow will be generally in the direction of the Breedoge River. • Groundwater discharges to the streams crossing the aquifer where the subsoil is not too thick or impermeable. There is likely to be a certain amount of discharge to the surrounding Dinantian Pure Bedded Limestones of the Carrick-on-Shannon GWB. • There are two terrestrial ecosystems that lie partially within the body that appear dependent on groundwater.
<p>Attachments</p>	<p>None</p>
<p>Instrumentation</p>	<p>Stream gauges: 26113 (Owenaforeesha Riv.) EPA Water Level Monitoring boreholes:n/a EPA Representative Monitoring boreholes: n/a</p>
<p>Information Sources</p>	<p>Lee, M. & Daly D. (2003) <i>County Roscommon Groundwater Protection Scheme</i>. Main Report. Roscommon County Council & Geological Survey of Ireland, 54pp. Aquifer Chapters: Dinantian Mixed Sandstones, Shales and Limestones</p>
<p>Disclaimer</p>	<p>Note that all calculation and interpretations presented in this report represent estimations based on the information sources described above and established hydrogeological formulae</p>

Castlereas Bellangare Groundwater Body (For Reference)



List of Rock units in Castlerea Bellanagare Groundwater Body

Rock unit name and code	Description	Rock unit group
Boyle Sandstone (BO)	Sandstone, siltstone, black mudstone	Dinantian Mixed Sandstones, Shales and Limestones

