Appendix 7

Description of the regional catchments

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The descriptions of the catchments are based on the River Basin District (RBD) within which they are located. Diagrams are included for each RBD which contain information on the rock units, vulnerability and subsoils, soils and topography. The aquifers contained within each catchment have been provided previously in Chapter 4. The legend for the rock units is provided below in Figure 1.

Figure 1. The legend for rock units in Ireland used in the diagrams below for Appendix 5.

Eastern RBD

Aughrim

Area = 224km2, Hydrometric station KNOCKNAMOHILL 10028

Comments: Velocity-area station with rock outcrop acting as control. Records stop July 1989. Stable control. Good rating. Station re-commissioned 1990.

Topography: Quite a broad standard deviation in heights; 126m, and steep slopes. Average slope 14%

Geology: Dominated by Pl and Ll aquifers. Large proportion of extreme vulnerability with rock close to the surface. Overlain mainly by Lower Paleozoic sandstone and shale tills.

Characteristics: Approximately 40% pasture land and 17% forestry

Avonmore

Area = 390km2, Hydrometric station RATHDRUM 10002

Comments: Velocity-area station with rock outcrop acting as control. Records stop July 1989. Stable control. Good rating. Station re-commissioned 1990.

Topography: Quite a broad standard deviation in heights; 164m, and steep slopes. Average slope 17%

Geology: Dominated by Pl and Ll aquifers, Pl in upper reaches of catchment. Pu aquifer surrounding the hydrometric station. Large proportion of extreme vulnerability with rock close to the surface. Blanket peat in the upper reaches of the catchment. Lower Paleozoic sandstone and shale tills in the lower reaches of the catchment.

Characteristics: Approximately 20% pasture land and 17% forestry.

Boyne

Area 2532km2; Hydrometric station SLANE CASTLE 7012

Comments: Velocity-area station with natural control. Stable control. Very good rating over the entire flow range.

Topography: Generally a very shallow catchment; standard deviation in height of catchment, 28m. Average slope 3%.

Geology: Complex mixed aquifer types. Dominant aquifers include productive fissured Lm aquifer (mainly Dinantian Upper Impure Limestones), Ll aquifers (mainly Dinantian Upper Impure Limestones and Dinantian Pure Unbedded Limestones) and Pl aquifers (mainly Silurian Metasediments and Volcanics). Small proportion of gravel in catchment. Small proportion of extreme vulnerability. Dominant subsoils include tills and Cut Peat.

Characteristics: 96% OPW channelisation, 73% pasture.

Deel (Munster)

Area 487km2; Hydrometric station RATHKEALE 24013

Comments: Velocity-area station with natural control. Variable rating due to severe weed growth.Good low flow rating very good middle and high flow ratings. Did not select INCHIROURKE MORE 24029 downstream because water supply intake weir as control although does have good rating.

Topography: Standard deviation in height of catchment, 53m. Average slope 4%. Steep slopes are mainly in the west of the catchment.

Geology: Complex mixed geology. Karst aquifer Rkc at the lower reached of the catchment (Dinantian Pure Unbedded Limestones). Also large proportion of karst aquifer Rkd (Dinantian Pure Unbedded Limestones) in centre of catchment and small amount of productive fissured Rf aquifer (Devonian Kiltorcan-type Sandstones) at the foothills of mountainous region to the east of the catchment. The rest of the catchment is made up of mainly Ll aquifer (Dinantian Upper and Lower Impure Limestones) with some Pu aquifer (Namurian shales). Small proportion of gravels in the catchment. Extreme vulnerability is extensive around the periphery of the catchment (mainly to the mountainous west). Very little peat in the catchment. Subsoils dominated by undifferentiated tills, Devonian sandstone tills with Namurian Sandstone and Shale tills in the west.
Characteristics: 83% pasture, 49% OPW channelisation.

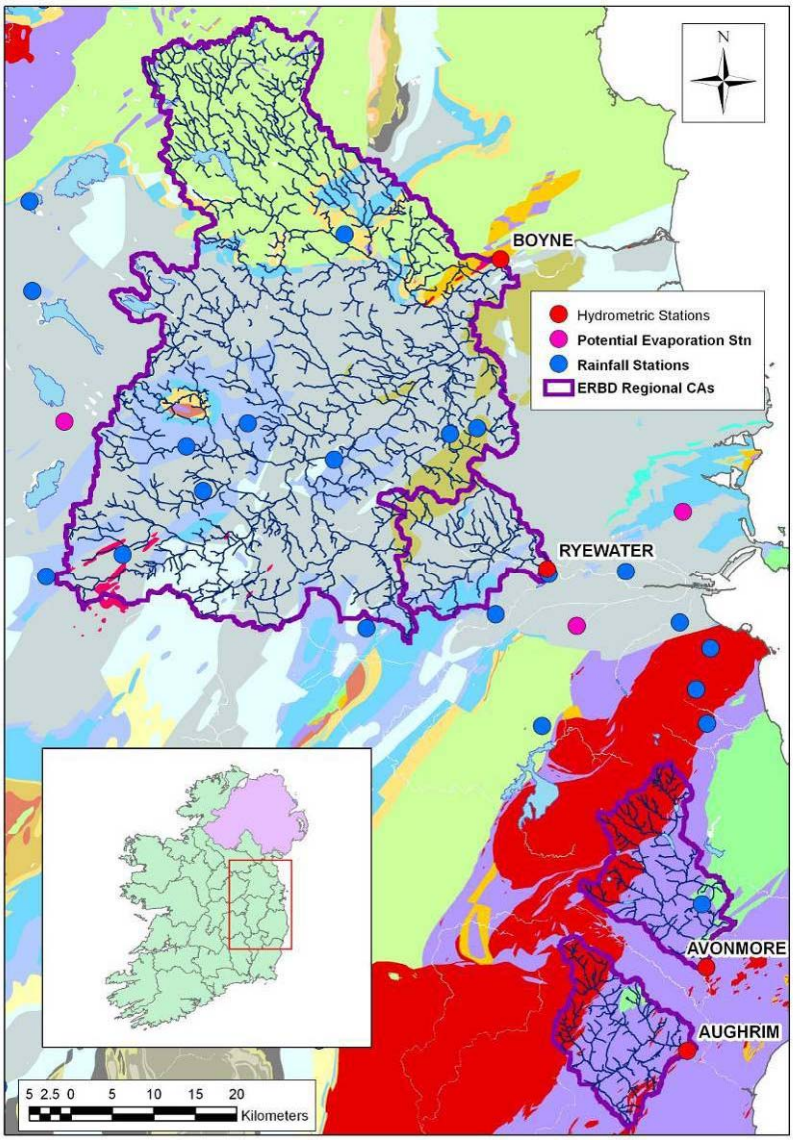

Figure 2. Rock units in the regional catchments selected for the Eastern RBD: Aughrim, Avonmore, Boyne and Ryewater catchments.

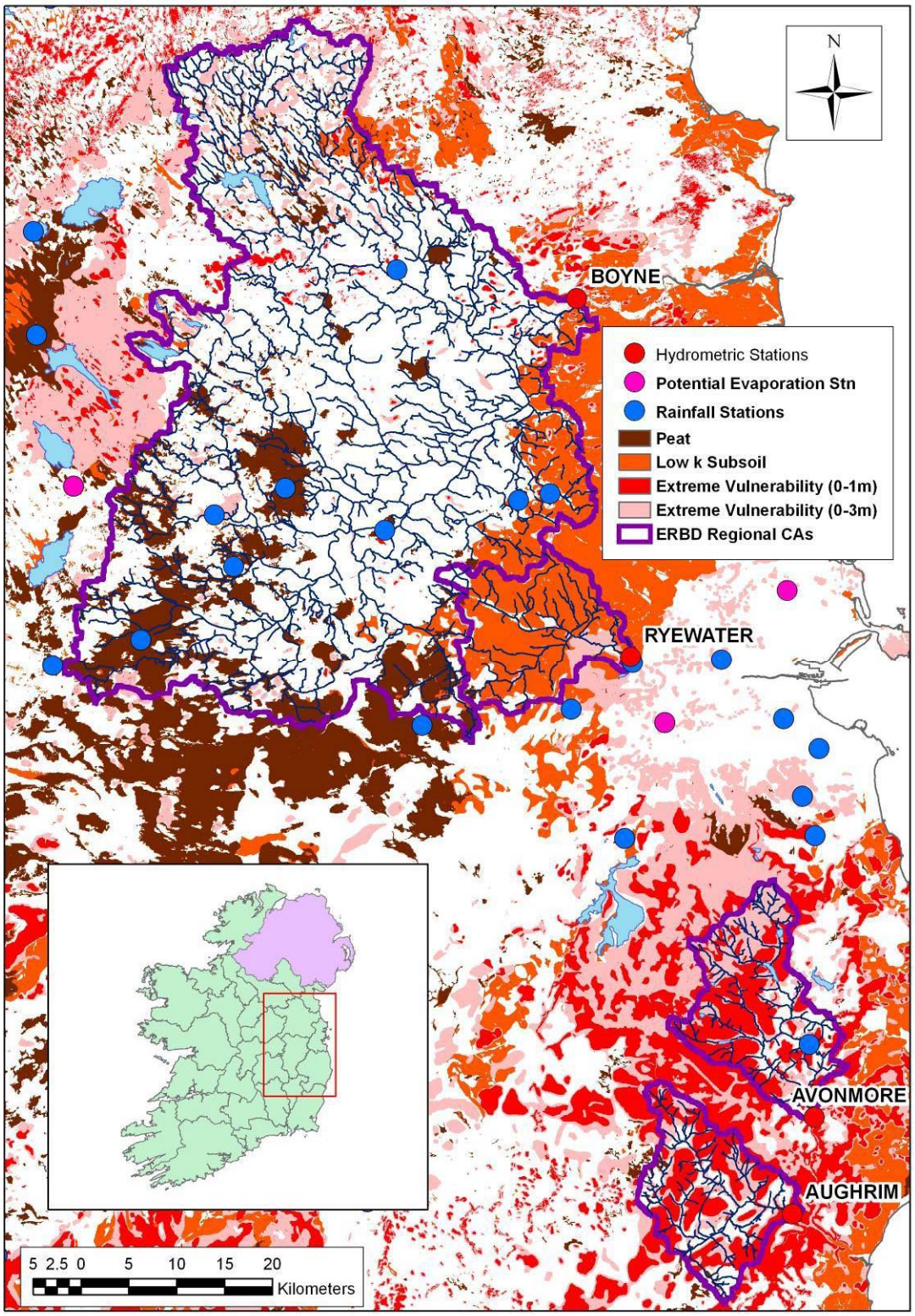

Figure 3. Vulnerability and subsoils in the regional catchments selected for the Eastern RBD: Aughrim, Avonmore, Boyne and Ryewater catchments.

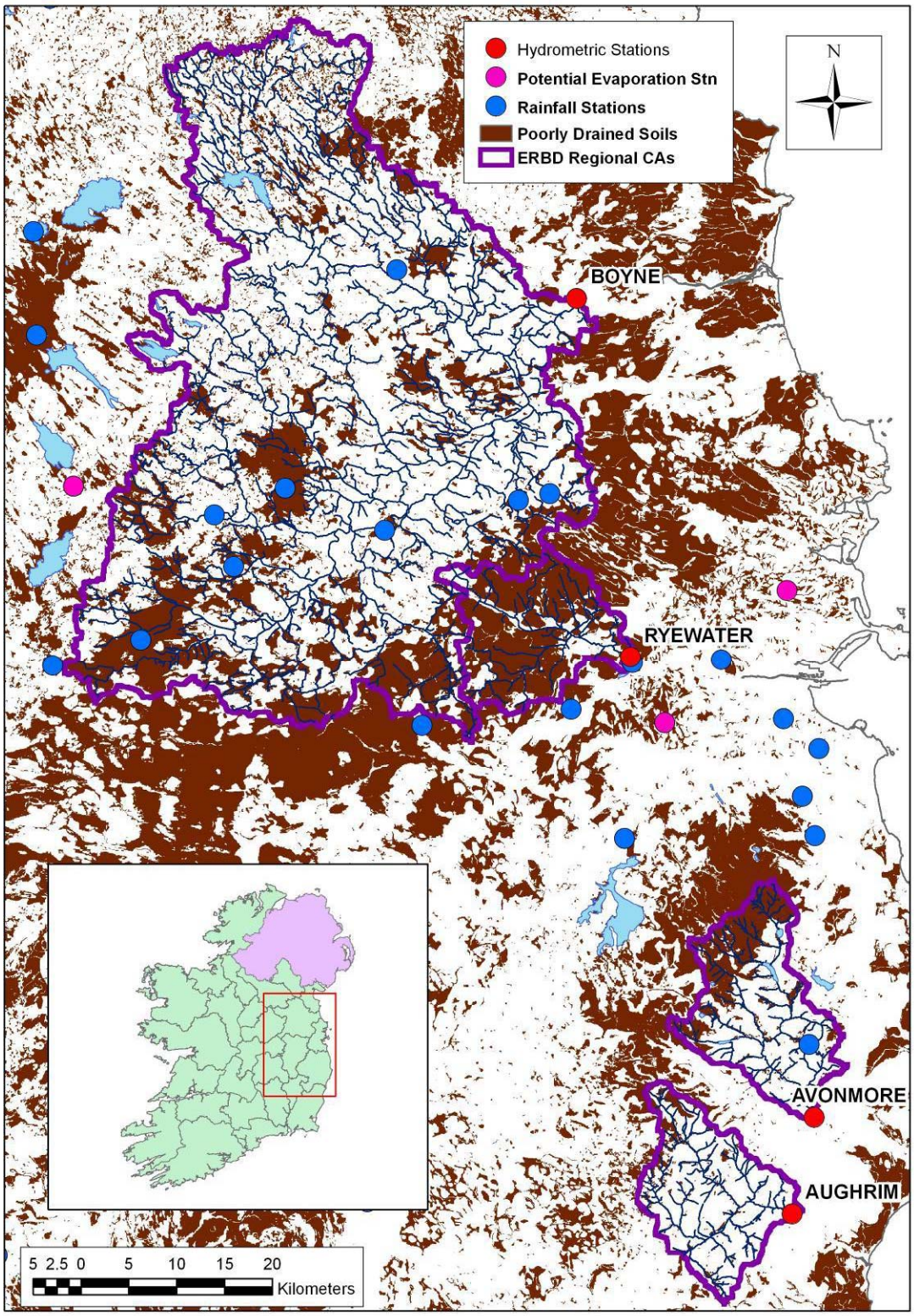

Figure 4. Poorly drained soils in the regional catchments selected for the Eastern RBD: Aughrim, Avonmore, Boyne and Ryewater catchments.

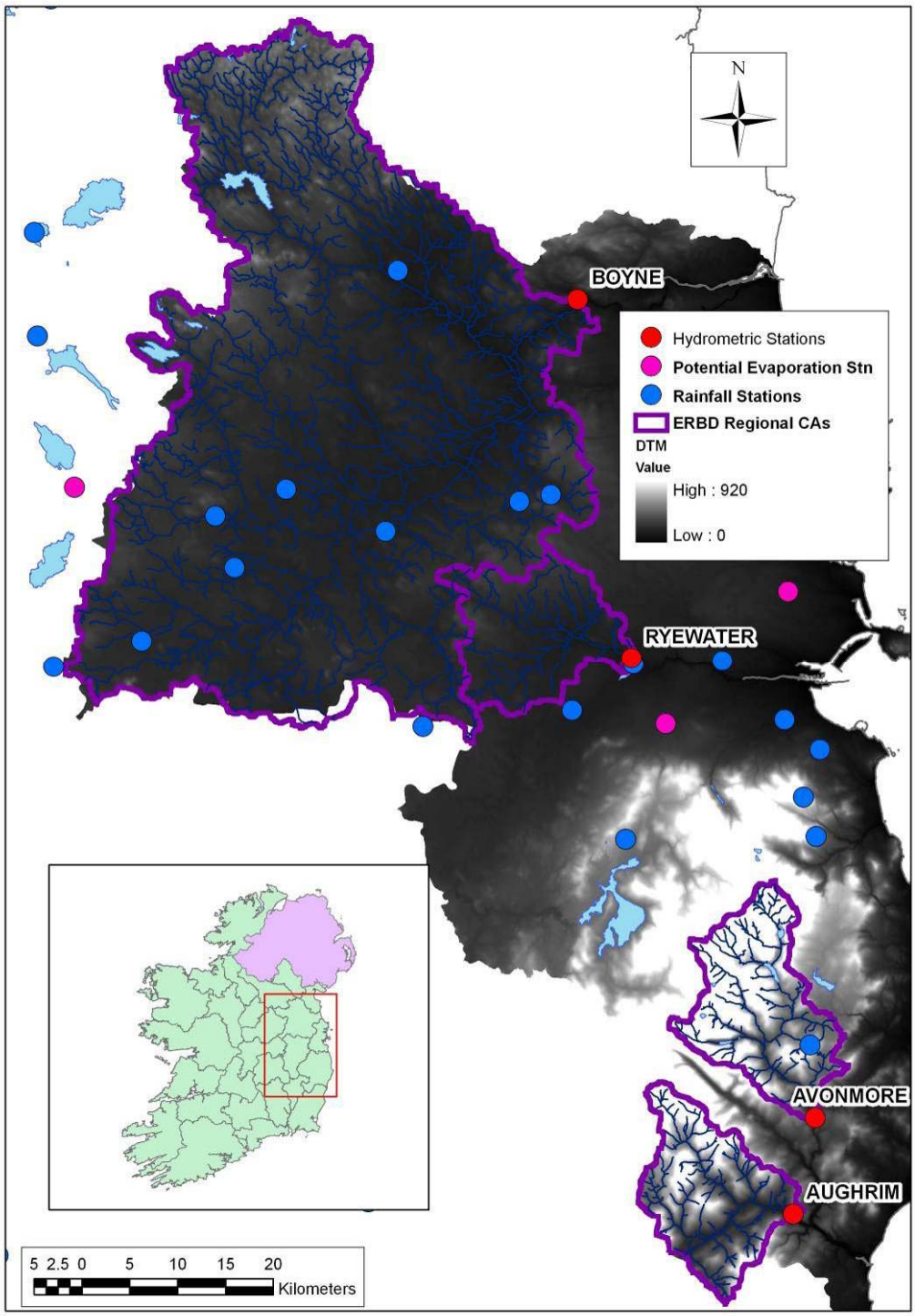

Figure 5. Digital Terrain Model (DTM in metres) of the regional catchments selected for the Eastern RBD: Aughrim, Avonmore, Boyne and Ryewater catchments.

Shannon RBD

Boyle

Area 526km2; Hydrometric station TINACARRA 26012

Comments: Velocity-area station with rock control. Stable control. Very good ratings for the entire flow range. Did not select BOYLE ABBEY BRIDGE 26108 because ALR subject to silting, water level only.

Topography: Generally a very shallow catchment; standard deviation in height of catchment, 22m. Average slope 2%.

Geology: Dominated by Rkc aquifer (Dinantian Pure Bedded Limestones) in the south of the catchment and Ll aquifers (Dinantian Lower Impure Limestones, Dinantian Sandstones, Shales and Limestones, Basalts and othe volcanic rocks) and Pl aquifers (Silurian Metasediments and Volcanics, Devonian Old Red Sandstones) in the north of the catchment. Quite a large proportion of extreme vulnerability in the catchment. Hydrometric stationlocated in extreme vulnerability. Subsoils are dominated by Cut Peat, Devonian Sandstone tills and Devonian/Carboniferous Sandstone tills.

Characteristics: Lough Gara is a large lake in the catchment (>50Ha), 50% pasture.

Camlin

Area 328km2; Hydrometric station MULLAGH 26019

Comments: Velocity-area station with natural control. Stable control. Good low flow rating. Very good middle and high flow ratings.

Topography: Generally a very shallow catchment; standard deviation in height of catchment, 27m. Average slope 3%.

Geology: Dominated by Ll aquifer in the upper part of the catchment (Dinantion Pure Bedded Limestones and Dinantian Sandstones, Shales and Limestones) with some Pl aquifer (Ordivician Metasediments). Rkc aquifer in the lower reaches of the catchment (Dinantion Pure Bedded Limestones). Hydrometric station located on Rkc aquifer. Large proportion of extreme vulnerability in the catchment (<3m). Subsoils are dominated by Cut Peat and Lower Paleozoic Sandstone and Shale tills.

Characteristics: 37% OPW channelisation, 84% pasture.

Clodiagh

Area 379km2; Hydrometric station RAHAN 25016

Comments: Velocity-area station with natural control. Stable control with large seasonal variation due to heavy weed growth. Fair low flow ratings. Good middle flow very good high flow ratings.

Topography: Standard deviation in height of catchment, 60m. Average slope 2%. The relatively large standard deviation is related to a mountainous region in the south of the catchment.

Geology: Complex mixed aquifer scenario. Karst Rkd aquifer trending NE-SW through the catchment (Dinantian Pure Bedded Limestones). Hydrometric station located on the karst aquifer. Large proportion of Ll aquifer (Dinantian Lower Impure and Dinantian Pure Unbedded Limestones) in the catchment. Small proportion of Productive fissured Rf aquifer (Devonian Kiltorcan-type Sandstones) at the foothills of mountainous region, surrounded by Pl aquifer in the south of the catchment, similar to the Blackwater

catchment. Some gravel in the catchment as well. Small proportion of extreme vulnerability. Main subsoil types include undifferentiated tills and Cut Peat.
Characteristics: 73% OPW channelisation, 66% pasture.

Feale
Area 659km2; Hydrometric Station LISTOWEL 23002
Comments: Velocity-area station with bridge acting as control. Stable control. Rating at low flow is stable but insensitive for very low flows.Good middle and upper ratings. No real selections available further up the Feale with large catchments.
Topography: Standard deviation in height of catchment, 80m. Average slope 7%.
Geology: Dominated by Ll aquifer (undifferentiated Namurian and Namurian Sandstones and Shales). At the outlet of the catchment there is mainly Rkd aquifer (Dinantian Pure Unbedded Limestones) as well as some Pu aquifer (Namurian Shales). The hydrometric station is located on the Pu aquifer although it is very near to the Rkd aquifer (100m). Depending on the accuracy of the GIS datasets this station may be located in either aquifer regime? There is also gravel aquifer along part of the length of the main channel. The catchment is dominated by extreme vulnerability. The main subsoils are Namurian Sandstone and Shale tills with Blanket Peat dominating the west of catchment.
Characteristics: Mainly pasture 50%.

Maigue
Area 840km2; Hydrometric Station 24008 CASTLEROBERTS
Comments: Velocity-area station with weir control. Stable control. Good rating. Did not select ADARE MANOR (24009) downstream because water level only, backwater by tide.
Topography: Standard deviation in height of catchment, 40m. Average slope 3%.
Geology: Complex mixed aquifer. Dominant aquifer types include productive fissured Rf (Lower Dinantian Sandstones, Shales and Limestones, Devonian Kiltorcan-type Sandstones) and Lm (Dinantian Pure Bedded Limestones) aquifers, poorly productive Ll aquifer (mainly Dinantian Lower Impure Limestones, Dinantian Upper Pure Limestones, Dinantian Upper Impure Limestones, Basalts and other volcanics), and karst aquifer Rkd (Dinantian Pure Unbedded Limestones). Also some Pu and Lk aquifers. Large proportion of extreme vulnerability. Some gravel aquifer. Dominant subsoils include Devonian Sandstone tills and undifferentiated tills.
Characteristics: Pasture 49%, Forestry 11%.

Fergus
Area 626km2, Hydrometric station BALLYCOREY 27002
Comments: Velocity-area station with flat vee weir control. Stable control. Very good ratings over the entire flow range. The majority of stations downstream are now obsolete. BALLYCOREY best site on the Fergus?
Topography: Standard deviation in height of catchment, 70m. Average slope 5%.
Geology: Catchment dominated by karst Rkc aquifer (Dinantian Pure Bedded Limestones) trending N-S along the main channel and width of the catchment. Other aquifers include Ll, Pl, Rf and Pu aquifers. Dominated by extreme vulnerability. Small

percentage of peat in catchment. Subsoils dominated by undifferentiated tills and Namurian Sandstone and Shale tills to the east and west of the catchment, respectively.
Characteristics: Small lakes. Channelisation 27%, Pasture 43%.

Flesk (Laune)
Area: 331km2. Hydrometric station FLESK 22006
Comments: Velocity-area station with natural control. Stable control. Very good rating over the full range of flows. Did not choose station for entire Laune catchment because they are downstream of main lake.
Topography: Quite mountainess catchment. Standard deviation in height of catchment, 135m. Average slope 12%.
Geology: Dominated by Ll aquifer (mainly undifferentiated Namurian in the north of the catchment and Devonian Old Red Sandstones in the south). Some Rkd aquifer. Hydrometric station located in Rkd aquifer. Extreme vulnerability dominates the south of the catchment. Mixed subsoil types: Blanket Peat, Devonian Sandstone tills, Namurian Sandstone and Shale tills.
Characteristics: 29% pasture, 7% forestry.

Graney
Area: 289km2. Hydrometric station SCARRIFF 25030
Comments: Velocity-area station with natural control. Stable control. Very good ratings over the entire flow range.
Topography: Quite a variation in height across catchment. Standard deviation in height of catchment, 81m. Average slope 7%.
Geology: Catchment dominated by poorly productive Ll and Pl aquifer. Wide variation in geology (Silurian Metasediments and Volcanics, Devonian Old Red Sandstones, Dinantian Pure Unbedded Limestones, Dinantian Lower Impure Limestones). Large quantity of extreme vulnerability. Wide variation of subsoil types: main types include Blanket Peat, Lower Paleozoic Sandstones and Shale tills, Devonian Sandstone tills.
Characteristics: 47% pasture, 13% forestry, 10% OPW channelisation. Number of small lakes.

Inny
Area 1234km2, Hydrometric station BALLYMAHON 26021
Comments: Velocity-area station with rock control. Stable control. Very good ratings over the entire flow range.
Topography: Shallow catchment. Standard deviation in height of catchment, 24m. Average slope 3%.
Geology: Mainly poorly productive Ll aquifer (mainly Dinantian Upper Impure Limestones, Dinantian Pure Unbedded Limestones, Dinantian Lower Impure Limestones). Some Pl, Lk and Rf aquifers in the upper reaches of the catchment. Some gravel in catchment. Large quantity of extreme vulnerability in catchment.
Main subsoils are Lower Paleozoic Sandstone and Shale tills, Devonian/Carboniferous Sandstone tills, Cut Peat.
Characteristics: Large lakes, 80% pasture, 73% OPW channelisation.

Little Brosna
Area 465km2; Hydrometric station CROGHAN 25021
Comments: Velocity-area station with natural control. Stable control affected by weeds. Poor low flow rating. Fair middle flow rating. Good high flow rating. Better station upstream at Springfield but catchment size is 160km2 (perhaps too small though so have selected Croghan). NEW BRIDGE station downstream is only water level.
Topography: Steep slopes in upper reaches of catchment. Standard deviation in height of catchment, 64m. Average slope 4%.
Geology: Dominated by Ll aquifer (mainly Dinantian Pure Unbedded Limestones and Dinantian Lower Impure Limestones). Also productive fissured Rf, karst Rkd aquifer and Pl aquifer in catchment. Large amount of gravel in catchment. Hydrometric station located in Rkd aquifer. Large amount of extreme vulnerability in catchment, especially on the slopes of mountains. Subsoils dominated by undifferentiated tills and Cut Peat.
Characteristics: 36% OPW channelisation, 68% pasture, 6% forestry.

Mulkear
Area 656km2; Hydrometric station ANNACOTTY 25001
Comments: Velocity-area station with natural control. Stable control with some effect from weed growth. Good low flow ratings. Very good high flow ratings.
Topography: Steep slopes in the north-east of the catchment. Standard deviation in height of catchment, 107m. Average slope 7%.
Geology: Dominated by poorly productive Pl (mainly Lower Dinantian Sandstones and Shales and Silurian Metasediments and Volcanics) and Ll (Devonian Old Red Sandstones and Dinantian Lower Impure Limestones) aquifer. Also Rkd (Dinantian Pure Unbedded Limestones) and Lm (Dinantian Pure Bedded Limestones) in catchment. Rkd and Lm aquifers found at outlet of catchment. Hydrometric station located on Lm aquifer. Some gravels in catchment. Large amount of extreme vulnerability in catchment. Subsoils dominated by Devonian Sandstone tills, Lower Paleozoic Sandstone and Shale tills and Lower Paleozoic/Devonian Sandstone tills.
Characteristics: 68% pasture, 7% forestry, 8% channelisation.

Nenagh
Area 320km2; Hydrometric Station CLARIANNA 25029
Comments: Velocity-area station with natural control. Stable control. Very seasonal low and middle flow ratings due to excessive weed growth. Good rating at high flow. Did not select Annabeg downstream because obsolete.
Topography: Steep slopes in upper reaches of catchment. Standard deviation in height of catchment, 75m. Average slope 7%.
Geology: Dominated by Pl aquifer in the upstream in the catchment (mainly Silurian Metasediments and Volcanics) and Ll aquifer in the lower reaches (mainly Dinatian Pure Unbedded Limestones and Dinatian Lower Impure Limestones). Also some productive fissured Lm aquifer along the main channel. Small quantity of gravels in the catchment. Large quantity of extreme vulnerability, especially in the upper reaches of the catchment. Subsoils dominated by undifferentiated tills and Lower Paleozoic Sandstone and Shale tills.
Characteristics: 56% OPW channelisation, 75% pasture.

Rinn
Area 299km2; Hydrometric station JOHNSTON'S BRIDGE 26008
Comments: Velocity-area station with natural control. Stable control affected by weeds during low flows. Fair low flow ratings. Very good middle and high flow ratings.
Topography: Shallow catchment. Standard deviation in height of catchment, 28m. Average slope 4%.
Geology: Mainly Ll (mainly Lower Dinantian Sandstones, Shales and Limestones, Dinantian Lower Impure Limestones, Dinantian Upper Impure Limestones), Lm (Dinantian Sandstones) and Pu (Ordivician Metasediments) aquifers from west to east in the catchment. Some Rkc aquifer in the north of the catchment. Some extreme vulnerability in the catchment. Subsoils dominated by Cambrian Sandstone and Chert tills in upper catchment, Lower Paleozoic Sandstone and Shale tills and Cut Peat in the lower catchment.
Characteristics: 34% OPW channelistation, 51% pasture.

Ryewater
Area 211km2; Hydrometric station LEIXLIP 9001
Comments: Velocity-area station with flat vee weir control. Stable control. Very good rating over the entire flow range. Gaps in continuity of records due to interference with housing.
Topography: Shallow catchment. Standard deviation in height of catchment, 17m. Average slope 2%.
Geology: Dominated by Ll aquifer (Dinantian Upper Impure Limestones, Dinantian Pure Unbedded Limestones and Dinantian Lower Impure Limestones). Also Pl aquifer and, Lm and Lk aquifer in the upper reaches of the catchment. Extreme vulnerability mainly at lower end of the catchment. Subsoils dominated by undifferentiated tills and some Namurian Sandstone and Shale tills.
Characteristics: 18% OPW channelisation, 78% pasture.

Suck
Area 1600km2; Hydrometric station BELLAGILL 26007
Comments: Velocity-area station with natural control. The control is affected by weed growth. Good low flow ratings. Very good middle and high flow ratings.
Topography: Shallow catchment. Standard deviation in height of catchment, 20m. Average slope 2%.
Geology: Aquifer dominated by karst Rkc (Dinantian Pure Bedded Limestones) Small amount of Ll and Lm aquifer in the catchment. Extreme vulnerability mainly of the east of the cacthment. Subsoils dominated by undifferentiated tills, Devonian Sandstone tills and Cut Peat.
Characteristics: 65% pasture, 37% channelisation.

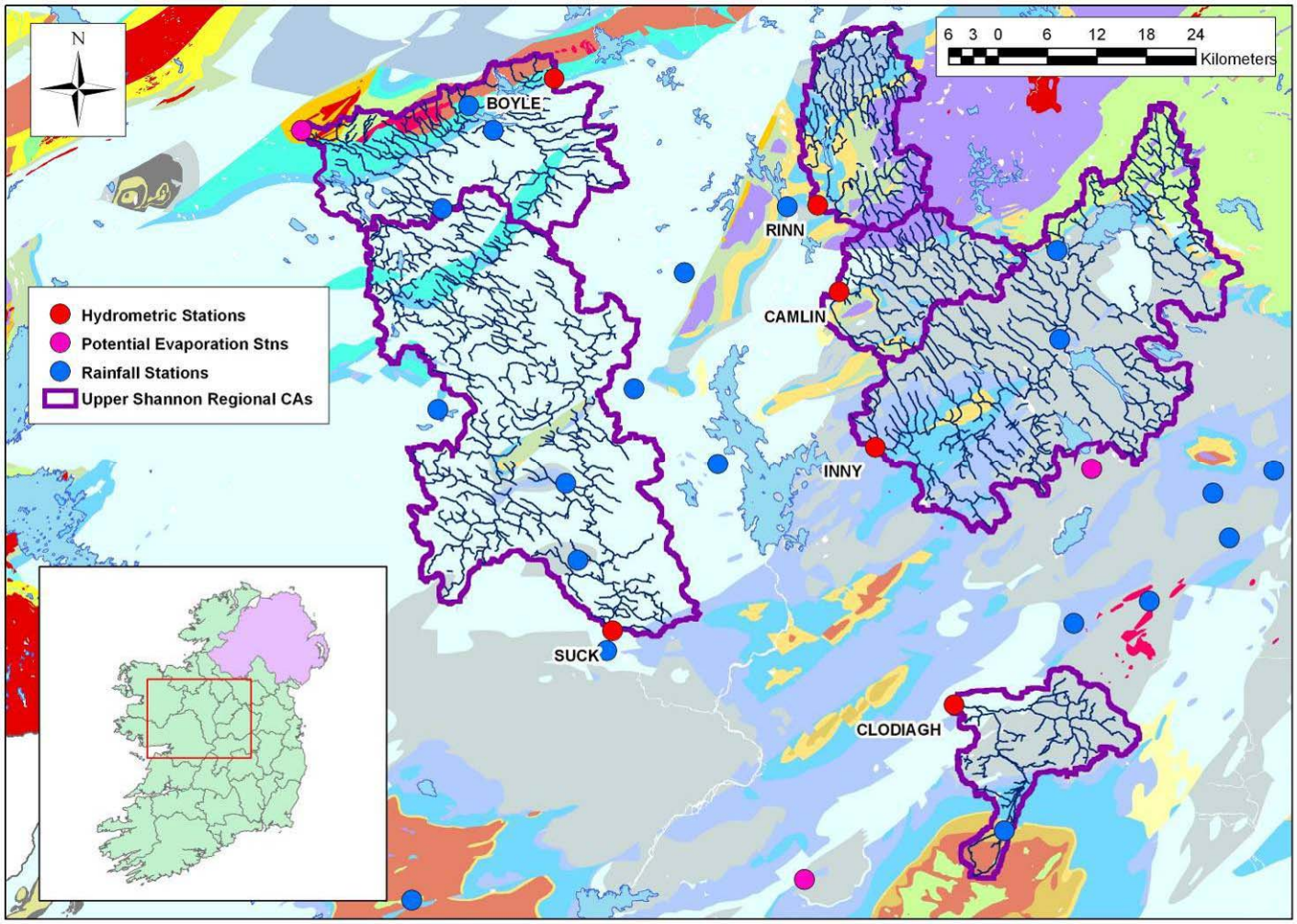

Figure 6. Rock units in the regional catchments selected for the upper reaches of the Shannon RBD: Boyle, Camlin, Clodiagh, Inny, Rinn and Suck catchments.

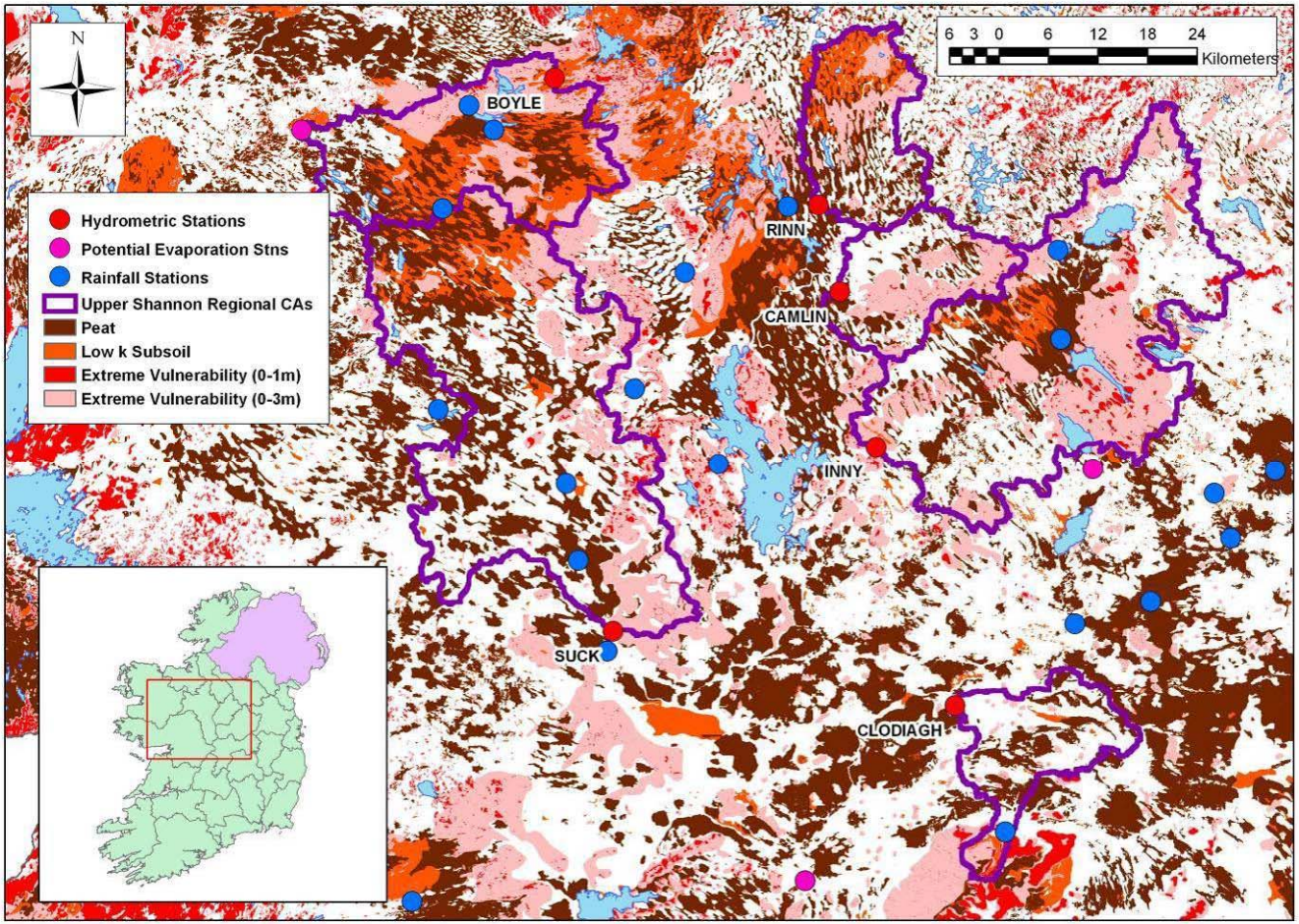

Figure 7. Vulnerability and subsoils in the regional catchments selected for the upper reaches of the Shannon RBD: Boyle, Camlin, Clodiagh, Inny, Rinn and Suck catchments.

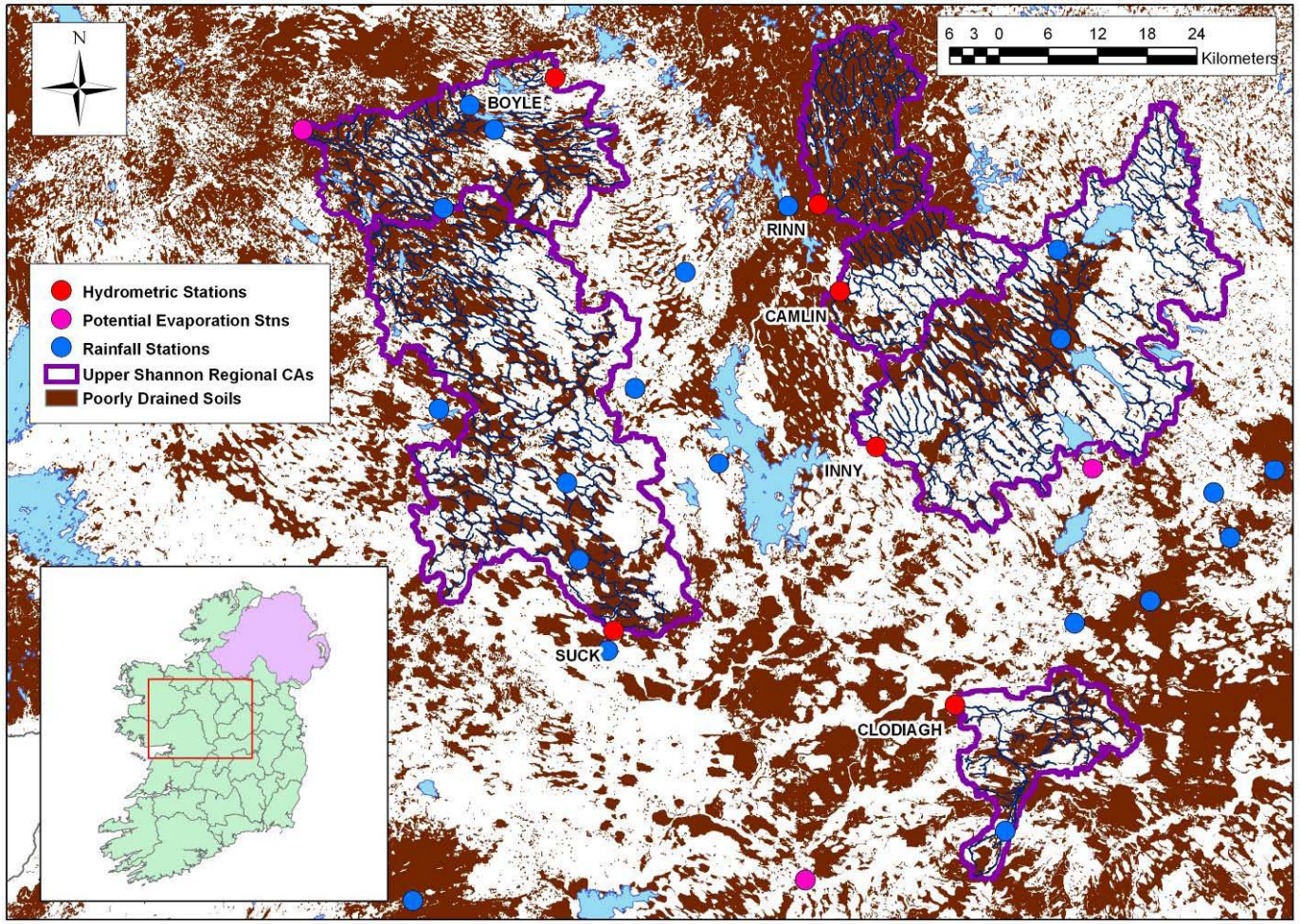

Figure 8. Poorly drained soils in the regional catchments selected for the upper reaches of the Shannon RBD: Boyle, Camlin, Clodiagh, Inny, Rinn and Suck catchments.

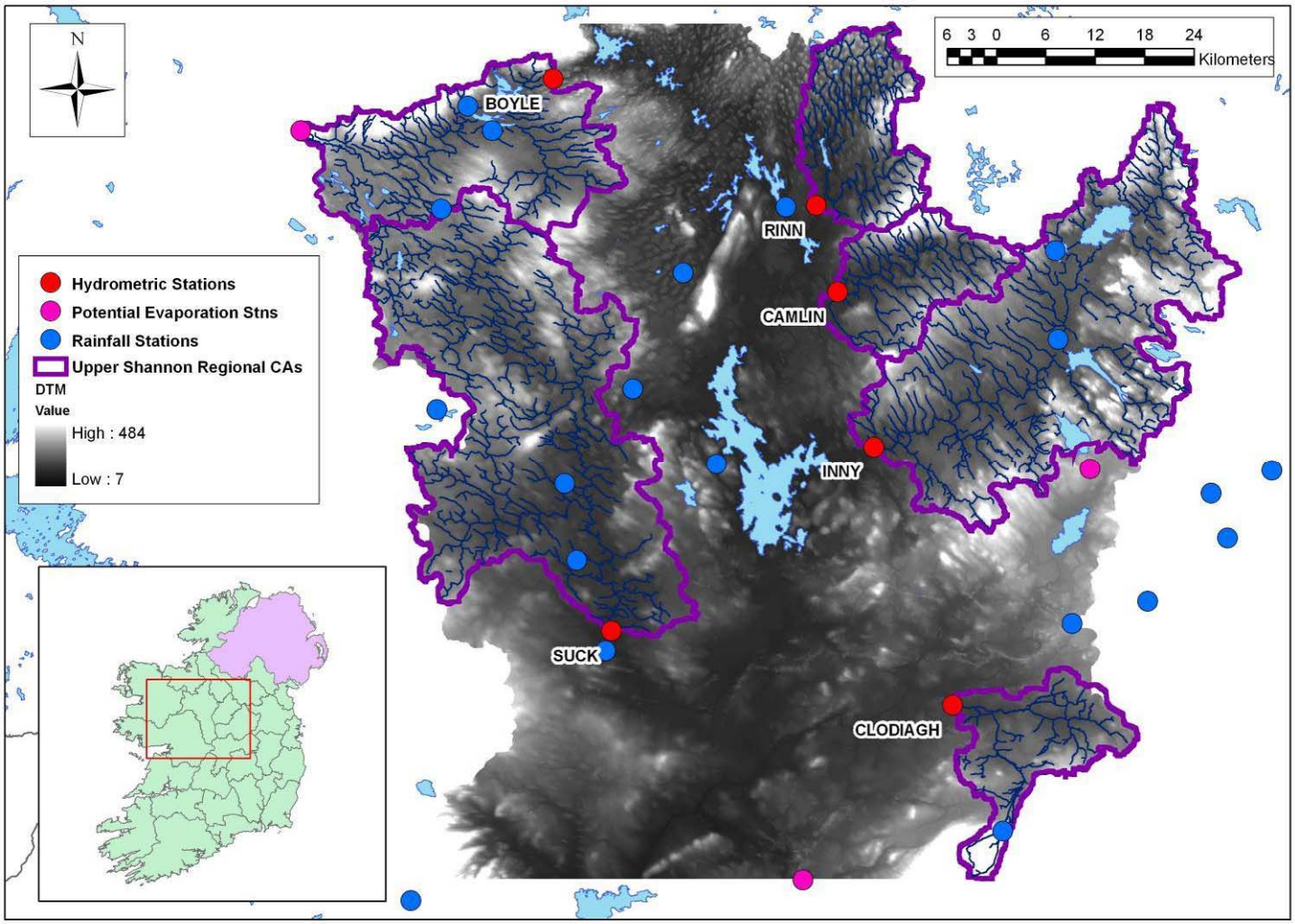

Figure 9. Digital Terrain Model (DTM in metres) of the regional catchments selected upper reaches of the Shannon RBD: Boyle, Camlin, Clodiagh, Inny, Rinn and Suck catchments.

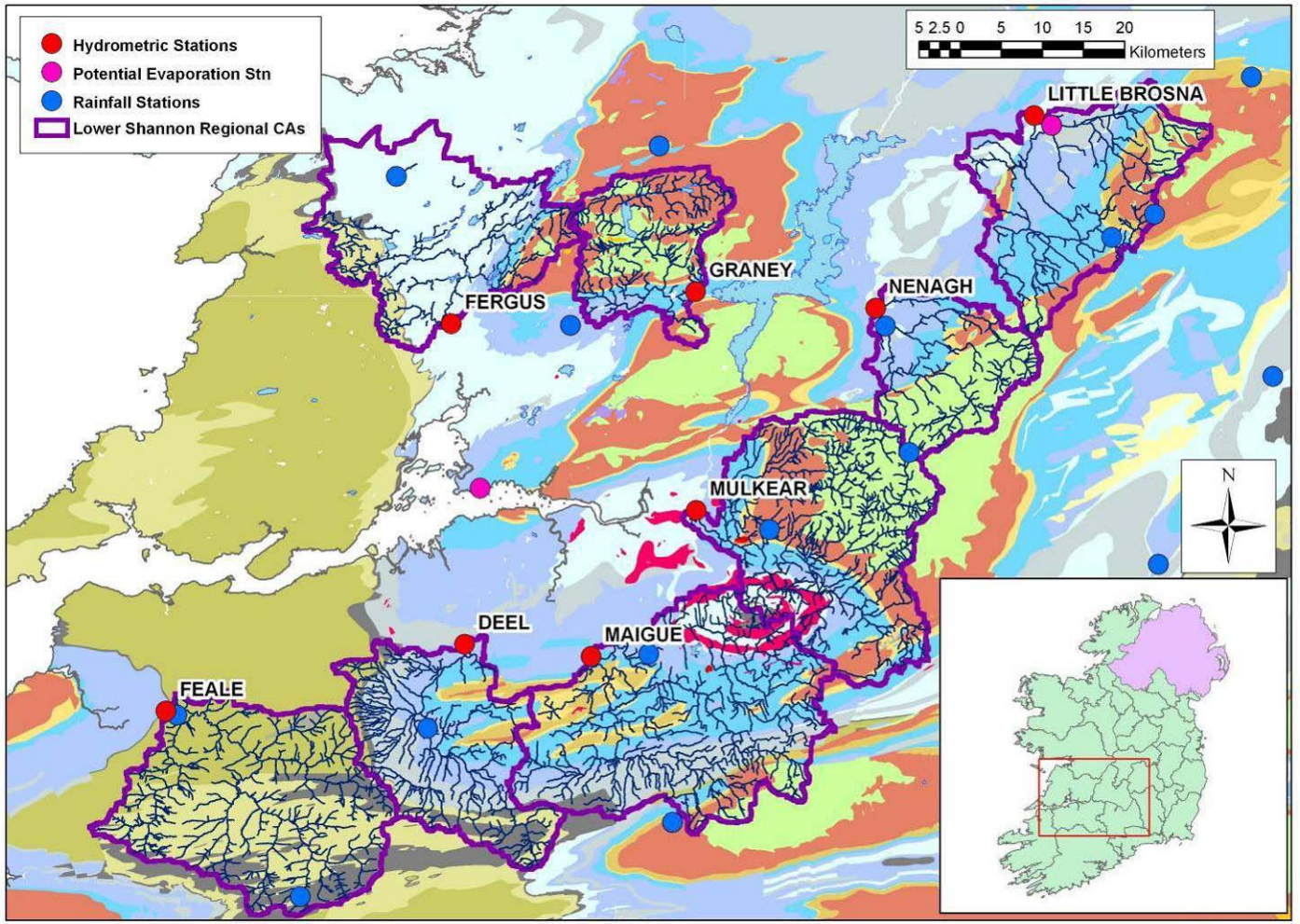

Figure 10. Rock units in the regional catchments selected for the lower reaches of the Shannon RBD: Deel, Feale, Fergus, Graney, Little Brosna, Maigue, Mulkear and Nenagh catchments.

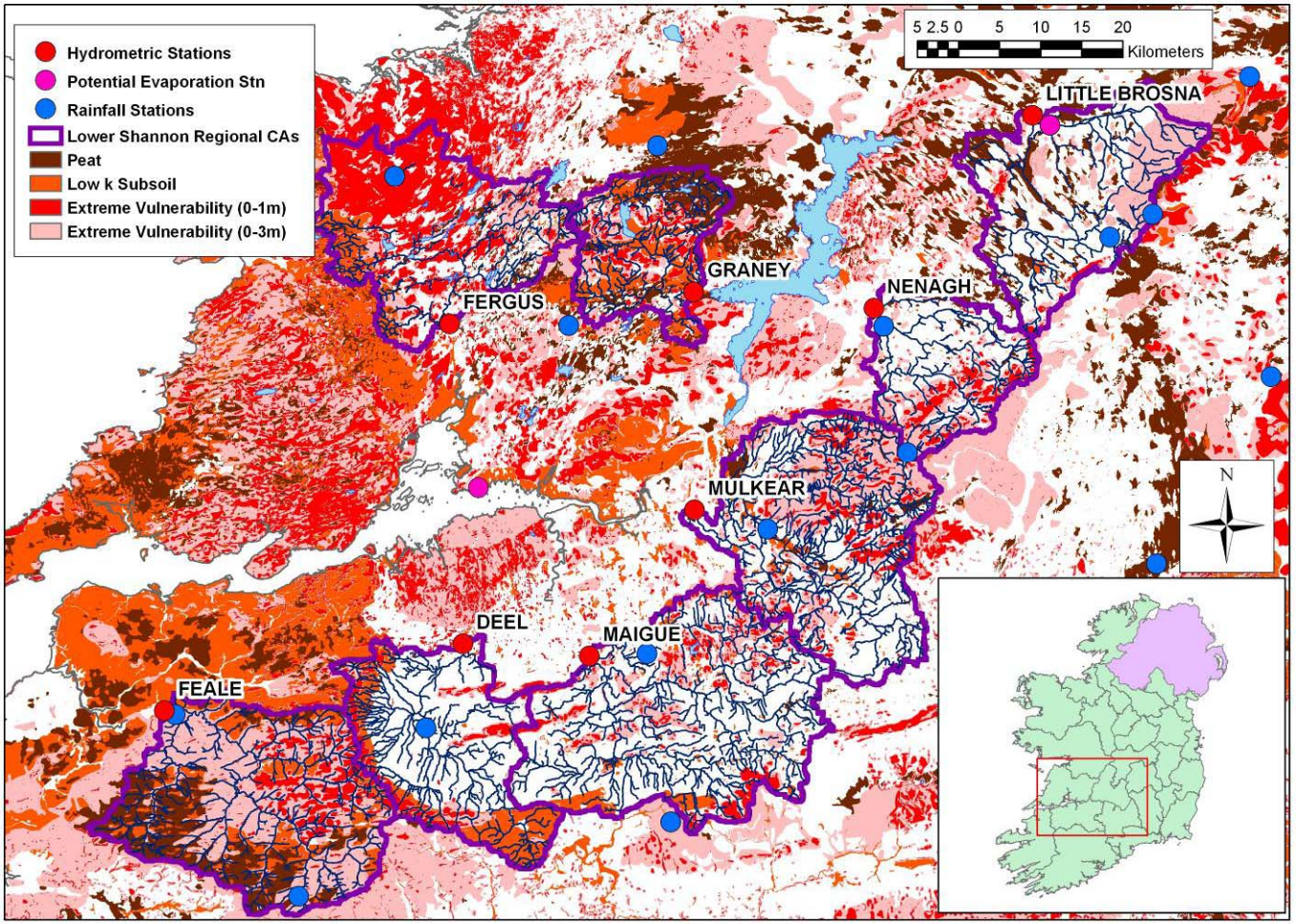

Figure 11. Vulnerability and subsoils in the regional catchments selected for the lower reaches of the Shannon RBD: Deel, Feale, Fergus, Graney, Little Brosna, Maigue, Mulkear and Nenagh catchments.

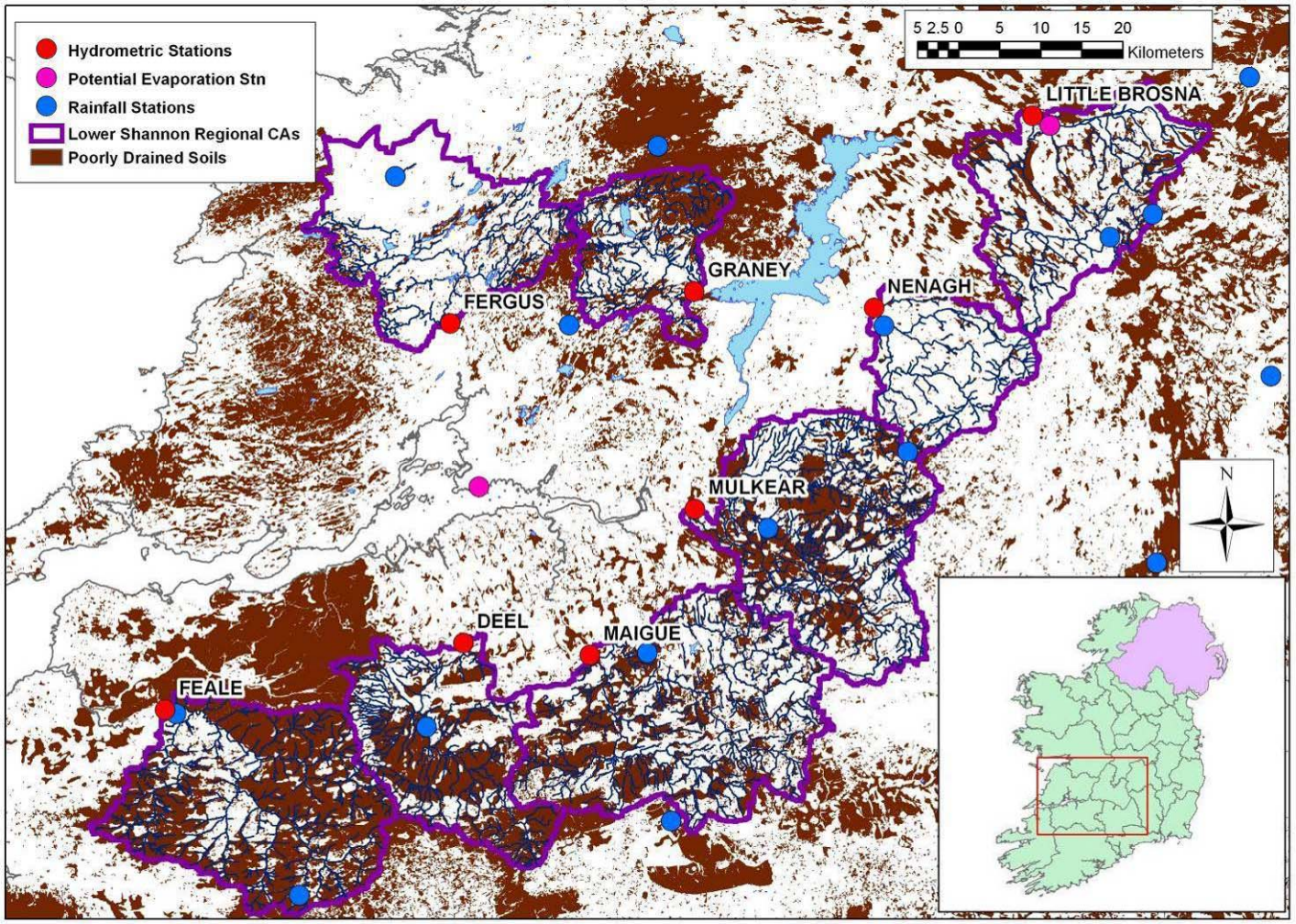

Figure 12. Poorly drained soils in the regional catchments selected for the lower reaches of the Shannon RBD: Deel, Feale, Fergus, Graney, Little Brosna, Maigue, Mulkear and Nenagh catchments.

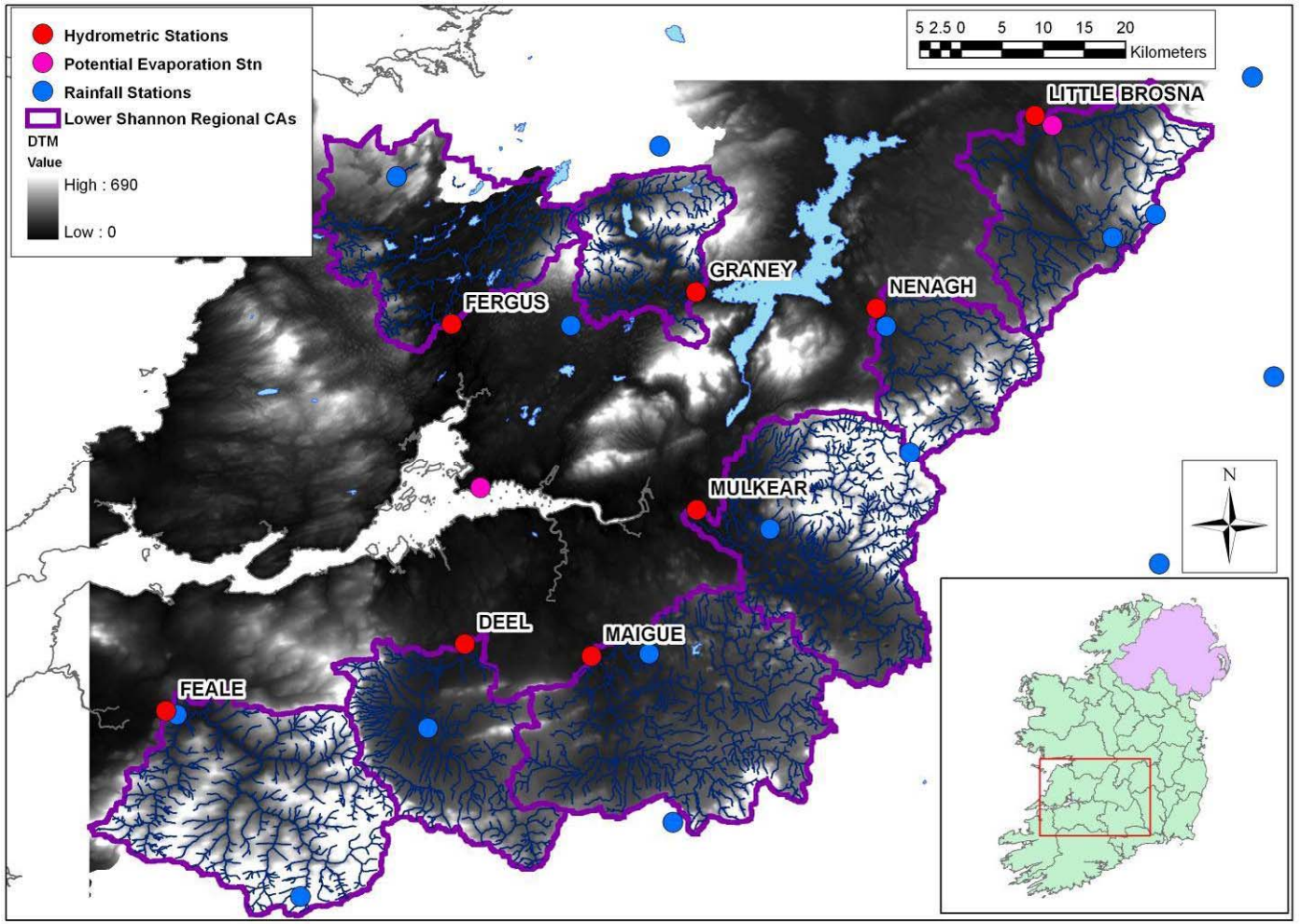

Figure 13. Digital Terrain Model (DTM in metres) of the regional catchments selected for the lower reaches of the Shannon RBD: Deel, Feale, Fergus, Graney, Little Brosna, Maigue, Mulkear and Nenagh catchments.