3. Jersey's water environment

This section provides a summary of the characterisation of water bodies undertaken for the IWMP and the approach taken to arrive at a current status classification based on an analysis of the existing data.

It also describes the results of the classification process and assigns a 'status' to each assessment: High; Good; Moderate; Poor; and Bad.

- **High status** indicates that the monitoring data and assessment show the health of the stream (in terms of the relevant quality elements – biology, chemistry, physico-chemical and hydromorphological components) matches what one would expect to see in an undisturbed example of the same river.
- **Good status** indicates that the classification assessment shows that the relevant biological quality elements are only **slightly** disturbed compared with the natural, undisturbed, condition. In this case, environmental quality standards would be achieved for the relevant physico-chemical quality elements.
- **Moderate status** indicates that the relevant biological quality elements are moderately changed from natural conditions.
- **Poor status** indicates a progressively more disturbed quality status compared with Moderate.
- **Bad status** indicates that these components are shown to be severely changed from the natural example as a result of human activities (e.g. large portions of biological communities that one should expect to be present are absent).

Different assessments are undertaken for different types of water body - the approach to classification is different in streams compared with coastal waters for example. However, the principle is the same and water bodies are classified using available data. Where the monitoring record is not complete or of insufficient length to make a robust assessment, and where it isn't appropriate to use other similar water bodies as proxy sites, a "not assessed" category has been assigned.

The classification has been undertaken using a series of tools specifically designed and built for Jersey during the first phase of this project. These tools make best use of available data on different environmental parameters relevant to any particular assessment (such as water quality monitoring data and / or ecology monitoring records) and combine these data in order to calculate a status classification.

When the results of individual classifications are combined into an overall classification value, it is the lowest class within the assessments being combined that drives the outcome. For example if the ecological status was Good but the chemical status was Moderate, then the overall status (ecological + chemical) would be Moderate. This is in line with the core principles of the Water Framework Directive applied elsewhere which generally requires all elements of classification to achieve Good status in order for the overall status to be Good.

More detail on this can be found in Technical Appendix A (Detailed Classification Approach).

With the long term aspiration being to ensure water bodies reach Good status, the focus of the IWMP to follow will be on those water bodies that are at less than Good status, alongside ensuring there is no deterioration in those that are already considered to be at Good status.

A confidence rating has been assigned to each assessment to reflect how robust the assessment is; this rating is assigned based on the availability of suitable monitoring data, how long the monitoring record used is and whether expert judgement has been used to inform the assessment. Three confidence ratings have been used: High, Moderate and Low, or for some classifications just High and Low. (More detail on confidence ratings can also be found in Technical Appendix A).

3.1 What do we look at to assess status and why?

To understand the status of the water environment, we have looked at several key indicators across the different water categories. These indicators are introduced here and discussed further in the following sections for each water body category.

- **Biological health indicators have been used for streams and coastal waters.** This includes: assessment of **macroinvertebrate** range and abundance in streams and coastal waters**; Seagrass and seaweed** range and abundance in coastal waters; and **phytoplankton** in coastal waters**.** As well as being good indicators of overall biological health of a water body, these indicators tend to be good indicators of organic enrichment

- **Water chemistry monitoring data is used to understand any pressures and impacts from chemical substances in groundwaters, streams and coastal waters**, for example from metals, pesticides, herbicides and other toxic or inorganic chemicals. Such chemicals from the urban and rural environment can make their way into surface waters can also infiltrate through the soil into groundwaters; this can render water supplies unfit for human consumption. This is a serious concern for an island so heavily reliant on groundwaters for water supply in some locations. These chemicals can also cause damage to aquatic assemblages.

- **Physico-chemical indicators** are also used as indicators of overall classification assessment in streams and coastal waters: this includes the presence of nutrients (nitrates and phosphorus), ammonia, dissolved oxygen, water temperature and acidity. Nutrient pressures are a particular concern on an agriculturally dominated island as nutrients in streams and reservoirs can cause disruption to drinking water supplies – either through an increased need for treatment to lower levels in raw water supplies (with an impact on water bills) or in more severe cases can result in a raw water source being temporarily unavailable, disrupting supply. High levels of nutrients can also cause prolific algal mats in the marine environment; in the freshwater environment elevated phosphorus levels can lead to excessive algal growth and subsequent drops in oxygen levels with implications for aquatic life.

- **Water body hydrology** (flow and water level) is assessed for streams because changes to the amount of water in the streams can affect the hydrology of the stream in terms of flow and water level with knock-on effects on macrophytes, invertebrates and fish. This can also affect the water quality of the streams through reduced dilution capacity. Lower water levels and flows can reduce habitat availability through a reduction in the natural wetted area of a stream; this can affect the amount suitable habitat available for in-stream ecology. Sustained lowering of stream water levels can also affect the ecology of surrounding habitats such as water meadows and grasslands. Abstraction pressures can also affect the status of our groundwaters, specifically the amount of water in our aquifers. As groundwaters comprise a large proportion of the baseflow of the streams during certain times of the year, over abstraction from groundwaters could result in deterioration in stream quality too. Wet meadow habitats and wetlands can also be affected. Reducing the amount of water in streams (and subsequently ponds) can serve to reduce dilution capacity and exacerbate water quality issues, for example for nutrients and specific pollutants in both surface waters and groundwaters.

- **Water body morphology** is also assessed as physical modifications to the natural form and function of streams and coastal waters can affect natural functions. Changes to the natural form and function of streams from impounding structures for reservoirs and abstraction locations change the morphology of a water body (the physical form and functional habitat available). Impoundments cause water to back-up, reducing flows and changing the habitat type from a flowing water course more to a standing water. This can cause a change in the natural stream ecology as well as reducing the water quality. In the coastal environment, morphological pressures such as sea walls can alter the natural distribution of intertidal habitats and species.

These pressures can affect surface waters and groundwaters and on an island like Jersey where the two are so closely linked (with groundwater making up a large proportion of stream flow at certain times of the

year) and in close connectivity with the coastal water bodies, the key pressures and risks to the water environment need to be carefully managed for all water categories in a coordinated way.

3.2 Jersey's streams

3.2.1 Introduction

The Island has numerous streams draining from the top of the Island, interspersed by various reservoirs, lakes and ponds, to the coastal waters. Underground aquifers contain water that has filtered through the bedrock over decades. The integrated nature of the Water Management Plan process recognises that decisions made about the management of any one water body category (streams, ponds, groundwaters) should not be made in isolation. This is particularly important in an island setting with small catchments.

The IWMP being developed looks at surface waters (such as stream catchments, lakes and ponds) individually as the basic planning unit within the Plan – these are defined as the "water body" unit. Stream catchment water bodies are grouped into catchments and are further aggregated into groups of catchments, termed "Water Management Areas" (which already exist as the main water management planning unit on the Island - Table 1). The IWMP also includes coastal waters as individual water bodies, as well as groundwaters.

Table 1: Water Management Areas

Water Management Area	WMA Surface Area (km^2)	% Island
WMA1 - Grands Vaux, Vallée des Vaux and St Helier	19	16%
WMA2 - La Haule and St Peter's Valley	15	13%
WMA3 - Longueville, Queen's Valley and Southeast	21	17%
WMA4 - Northeast	12	10%
WMA5 - Northwest	12	10%
WMA6 - St Aubin, St Brélade and Southwest	12	10%
WMA7 - St Ouën and West	17	14%
WMA8 - Waterworks Valley and Bellozanne Valley	11	9%
Whole Island total	119	100%

Using the contour map of the Island, a digital elevation model has been built to delineate the individual stream catchments. These have been grouped together in line with the existing eight Water Management Areas (WMAs) currently used by the States of Jersey as the main planning unit for water management purposes.

Using existing data on the location and size of these water bodies, we have only identified water bodies of a sufficient scale and relevance for separate assessment within the IWMP. Water bodies are the units for which environmental objectives will be set. These objectives will be the basis on which to protect and improve the environmental quality of water bodies and thereby the quality of the Island's water resources as a whole.

Some streams were considered too small to include as separate streams, for example those that are less than 500 metres in length and which have a small catchment outlet directly to the coastline. Such small water courses are highly intermittent and will frequently not contain water, making them difficult to manage effectively. Nonetheless, these small waters are not omitted from the IWMP process as they do fall within stream catchment water bodies and are therefore included in the IWMP as part of the catchment.

This approach has defined 39 separate stream catchment water bodies. We set out the number of stream catchment water bodies and the total length of stream contained within them in each WMA in Table 2 below.

Table 2: Number and length of IWMP streams in each WMA

Water Management Area (WMA)	Number of IWMP stream water bodies (catchments) in WMA	Length of IWMP streams within WMA
WMA1 - Grands Vaux, Vallée des Vaux and St Helier	1	18 km
WMA2 - La Haule and St Peter's Valley	2	15 km
WMA3 - Longueville, Queen's Valley and Southeast	3	17 km
WMA4 - Northeast	13	11 km
WMA5 - Northwest	7	8 km
WMA6 - St Aubin, St Brélade and Southwest	6	9 km
WMA7 - St Ouën and West	5	12 km
WMA8 - Waterworks Valley and Bellozanne Valley	2	13 km

Maps of Jersey's stream catchment water bodies are given overleaf in Figure 1.

Stream types

Natural characteristics, including geology, altitude and size, can influence the presence and abundance of biological communities in a water body. As such, it is important to define these natural factors, and the resulting **type** of the water body, in order to understand the biological communities that one would expect to see in a water body of a specific type (UKTAG, 2003).

To define individual water bodies, a delineation exercise has been undertaken using the 50m contour map of Jersey to build a digital elevation model (DEM). Each stream water body was considered separately in profile form, looking at the overall gradient and gradient changes along the streams, which are related to physical / geological transitions along the water course. The Island was found to have five water course types, of which nearly all the streams on the Island fall within two of these types, as seen in Figure 1 below.

As well as helping us to understand what conditions should be present in different water bodies, the typology exercise has also enabled classification status assessments to be undertaken in streams for which there are currently no monitoring data. In these cases, we have used the typology to incorporate data from other stream water bodies of the same typology to infer classification status.

Additional information on the Water body delineation and typology undertaken can be found in Appendix A.

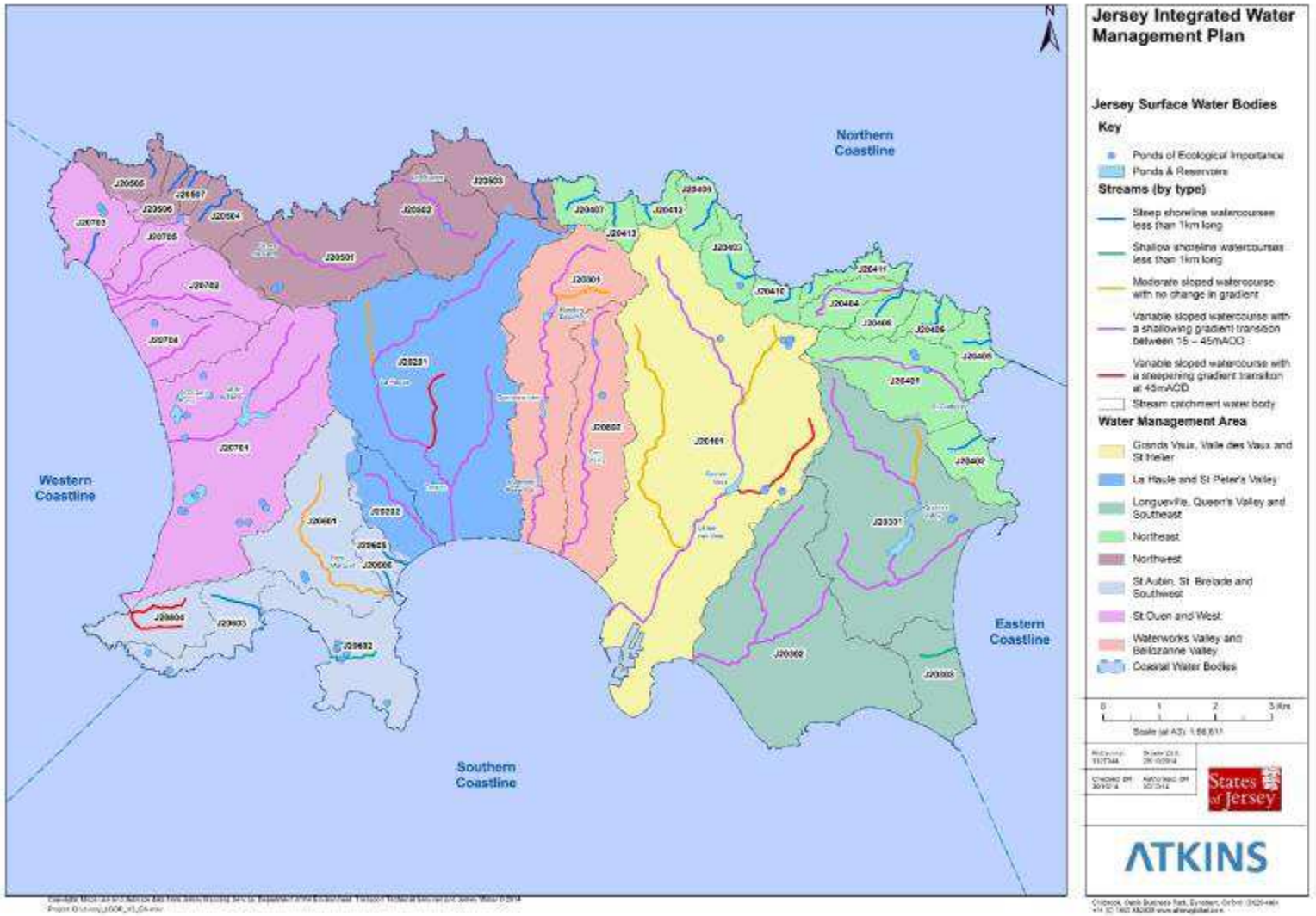


Figure 1: Jersey's stream catchment water bodies, main streams, reservoirs and coastal waters.

3.2.2 The current status of Jersey's streams

Assessment methods

As part of this study, we have used the data available on the Island to undertake assessments of the overall status / "health" of the Island's stream water bodies using adapted Water Framework Directive metrics.

The overall status of a water body is typically determined by separate assessments looking at different aspects of water management, including:

- Biology - invertebrates, macrophytes, and diatoms
- Physico-chemical – nitrate, phosphorus, temperature, dissolved oxygen, ammonia and pH
- Other chemicals (specific pollutants, priority and hazardous chemicals)
- Hydromorphology

These assessments are carried out separately and then combined to give an overall status classification for the water body at an ecological level, termed "Ecological Status". The methodology for individual assessments can be quite complex; very brief summaries of the classification approach used for the Jersey streams are provided in Table 3 below. These approaches have been based on similar assessments in both England and Wales and also in France.

Full method statements setting out how we have undertaken these assessments are available in Technical Appendix A.

The results of the stream classifications for the whole island are given in Figure 2 below.

Table 3: Status classification summary for Jersey streams

Classification assessment	Summary of approach taken
Biological classification of surface waters	Biological classification is usually comprised of individual assessments for fish, invertebrates, macrophytes and diatoms. • Fish are generic pressure indicators and although this is a useful indicator of the overall health of the river it does not provide any further insight into the specific pressures acting on the river. Furthermore, there are limited fish monitoring data. • Invertebrates are a good indicator of organic enrichment and toxic chemical pollution • Diatoms and macrophytes can be used as nutrient enrichment indicators, allowing a wider assessment of water quality pressures compared with invertebrate monitoring. There is currently no widespread macrophyte, fish or diatom monitoring undertaken on Jersey and hence it is not possible to include these in the biological assessment. As such, the biological assessment for this IWMP is limited to invertebrates only.
Chemical classification of surface waters	The chemical classification standards adopted for the WFD in England and Wales were applied to the Jersey water quality monitoring data. This was considered appropriate because the chemicals listed as being of major concern to European waters are those typically associated with urban areas / roads and also with agriculture – both of which are characteristic features on the Island. The standards relate to annual average (AA) and Maximum Allowable Concentration (MAC) and a similar approach has been adopted

Classification assessment	Summary of approach taken
	for the assessment on Jersey. Jersey monitoring results for these substances are compared against environmental quality standards in order to generate a classification.
Physico-chemical classification of surface waters	This assessment has compared Jersey's monitoring data with quality standards set from England and Wales, and France in order to generate a classification. This includes standards for: dissolved oxygen, temperature, pH, ammonia, nitrates and phosphorus (soluble reactive phosphorus). In addition to direct comparison of monitoring data against environmental quality standards, it is expected that the biological monitoring programmes as part of the wider ecological classification will indirectly monitor water quality.
Specific pollutant classification of surface waters	Both England and Wales and France have gone through the process of reviewing the list of chemicals to include in this category and assigning standards for each; we have drawn upon the experience of both in order to devise the Jersey list of standards which includes: Ammonia; Arsenic; Chlorine; Chromium(III); Chromium(VI); Copper; Cyanide; Cypermethrin; Diazinon; 2,4-dichlorophenol; 2,4-dichlorophenoxyacetic acid (2,4-D); Dimethoate; Iron; Linuron; Mecoprop; Permethrin; Phenol; Toluene; Zinc; Benzyl butyl phthalate; Carbendazim; Chlorothalonil; 3,4-dichloroaniline; Glyphosate; Manganese; Methiocarb; Pendimethalin; Tetrachloroethane; Triclosan; Chlortoluron; Oxadiazon; and 2,4 MCPA. The latter three chemicals underlined are herbicides included only on France's list but due to Jersey's proximity to France means they could be used on the Island. The standards relate to annual average (AA) and Maximum Allowable Concentration (MAC) and a similar approach has been adopted for the assessment on Jersey. Jersey monitoring results for these substances are compared against the environmental quality standards in order to generate a classification.
Hydromorphology classification of surface waters	Hydromorphology is a supporting element; it is only able to dictate the overall classification of a water body if everything else is High status. This assessment is split into two component parts; **hydrology** (river level and flow) and **morphology** (stream form and function). A high level assessment has been adopted, appropriate to the level of information that was available. This can be developed further in future planning cycles. For the ***hydrology*** component, three criteria for classification were established: **Slight impact** – the hydrological regime is close to natural with impact limited to modifications in land drainage and land-use, and/or groundwater abstraction within the water body is less than 40% of long term average recharge. **Moderate impact** – the hydrological regime mimics natural response, although depressed by groundwater abstractions (greater than 40% of long term average recharge) and/ or public water supply surface water abstractions. **Severe impact** – the hydrological regime is modified by a reservoir, significantly altering the quantity and dynamics of flow and/or groundwater abstractions are greater than 40% of long term average recharge and there is evidence of low flow ecological stress exacerbated by abstraction.

Classification assessment	Summary of approach taken
	For the ***morphological*** component of this assessment, the land use data were used to highlight areas where IWMP streams intersected urban (town, village, roads) areas, the six water supply reservoirs, and river abstraction locations. In this way a %modification (by length) assessment was built up for each water body; these were then similarly classified into Slight (0-5% modification by length), Moderate (6-14% modification by length) or Severe (>15% modification by length). When converted into a status classification: - Slight hydrology / morphology modification = Good - Moderate hydrology / morphology modification = Moderate - Severe hydrology / morphology modification = Poor
Determining overall status of surface waters	All of these status classification assessments have been combined to provide one single classification assessment which defines the overall Ecological Status of each water body. The categories are high, good, medium, poor, bad, and not assessed.

Results of Classification assessment in streams

The results of the status classifications for Jersey's stream catchment water bodies is given in Figure 2 below. The data at a water body level is given in Appendix B. This shows, for each assessment, the percentage of Jersey stream catchment water bodies in each status class. These results are discussed in the following sections.

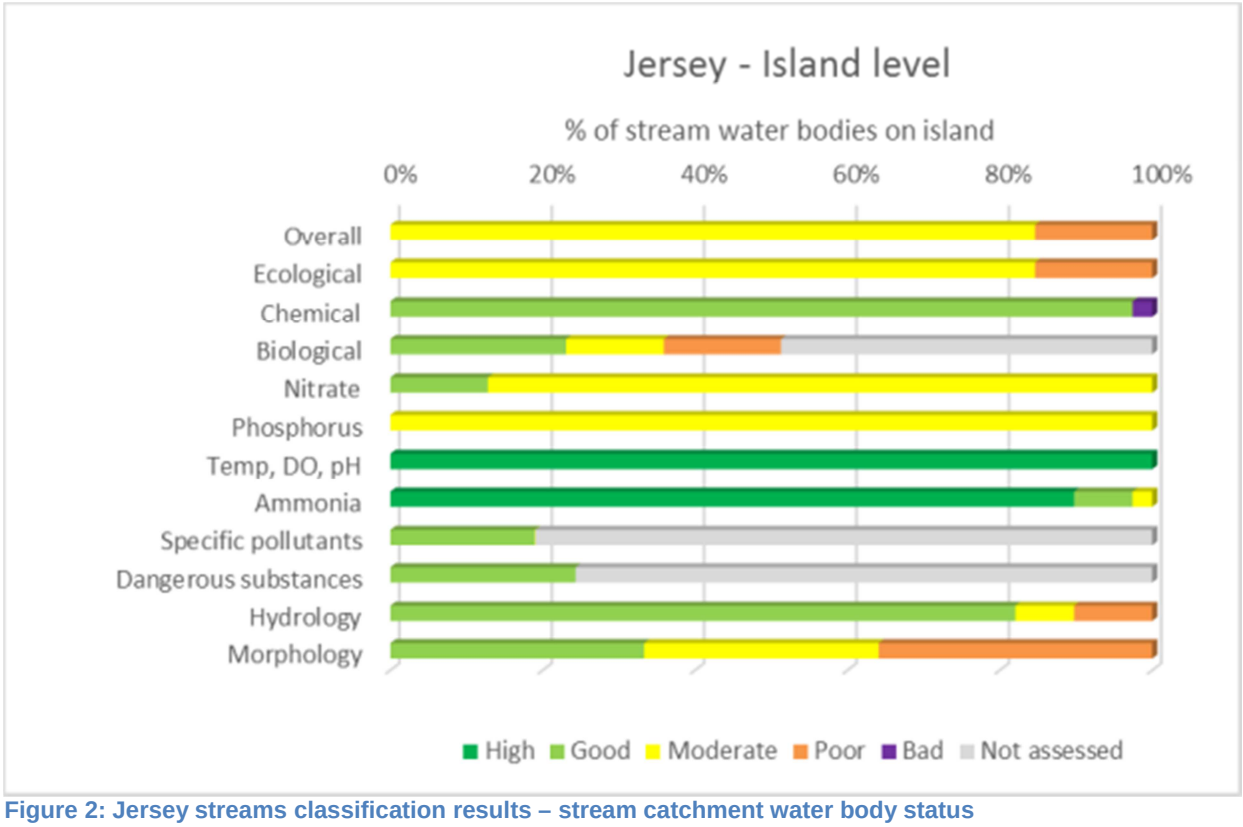


Figure 2: Jersey streams classification results – stream catchment water body status

Overall status

The combined classification assessments for overall status (ecology and chemical assessments combined) (Figure 6) and ecological status (biology and physico-chemical) (Figure 7) are the same; the majority are at less than Good status (33 out of 39 water bodies being considered as Moderate status). Six water bodies are further classified as Poor status. For context, in the more populated river basins across Europe, with densities of over 200 people per km^2, on average less than 30% of water bodies were classified at Good status. Jersey has a population density of over 800 people per km^2 so it is not surprising that there are significant pressures on the water environment.

Chemical status

Chemical status (Figure 8) across the Island's stream catchment water bodies is Good, in that the majority of stream water bodies pass the chemical standards.

Other Chemicals

There are 31 Specific Pollutants and 62 Dangerous Substance chemicals which are monitored under the WFD. Figure 3 and Figure 4 show that of the chemicals monitored on the Island, nearly all those assessed pass the standards or are at Good Status. Only one chemical, perfluorooctane sulfonate (PFOS) fails the standard in a single catchment (near the airport).

Many chemicals were risk assessed (4 Specific Pollutants; 14 Dangerous Substances), screened out and did not require direct monitoring to establish their chemical status. The remainder were assessed using monitoring data where they were available or not assessed where there were no data to inform a robust assessment. There are a large number of chemicals which have not been assessed. This varies from stream catchment to catchment, although ranges between 43 – 48 for Dangerous Substances and 18 – 27 for Specific Pollutants.

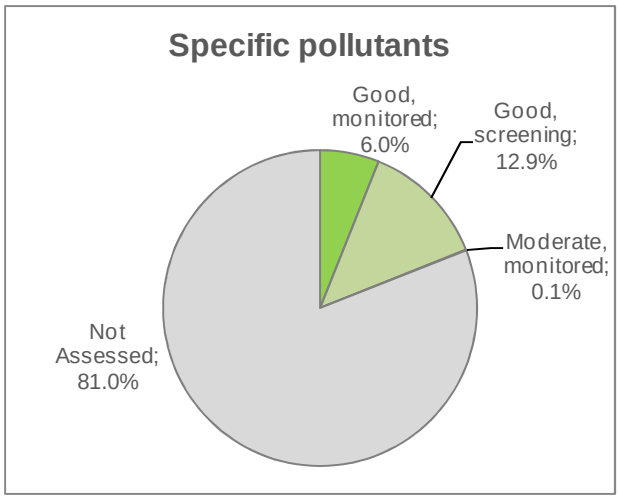


Figure 3: Specific pollutant classification summary

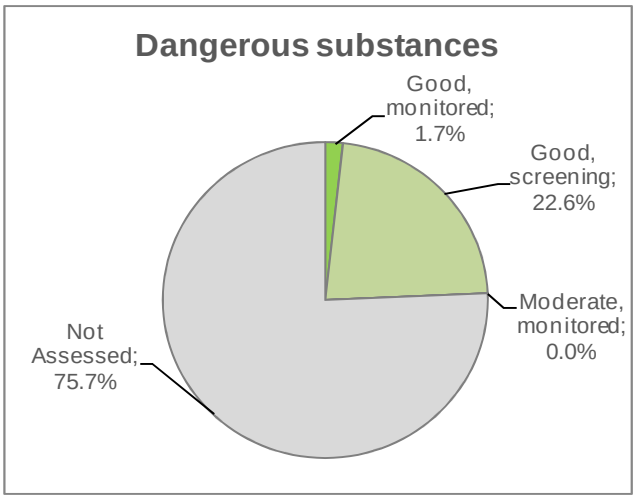


Figure 4: Dangerous substance classification summary

Pesticides

Pesticides have been considered within the IWMP from two angles:

a) **Within the status classifications. T**he pesticides that are covered under the Specific Pollutants or Dangerous Substances lists (See Appendix A) were considered within the status classification process (the results of which are included in Figure 3 and Figure 4 above). Data from Jersey Water's water quality monitoring programme was used to inform this assessment. 44 pesticides are monitored by Jersey Water at monitoring locations in, or near to, water supply reservoirs. 10 of these parameters match substances on the specific pollutant or Dangerous Substances lists

(Appendix A) and have therefore been included in the status classification. This status assessment helps us to understand the environmental status for pesticides.

b) **As a broader risk assessment:** Jersey Water also monitor a wide range of pesticides that are relevant to human health, and that are not included in the status classification approach. In order to ensure we understand the risks from pesticides to the uses of water on the Island (including drinking water supply via Jersey Water and also through private borehole supply), we have undertaken an additional risk assessment for pesticides. In this assessment, all Jersey Water total pesticide monitoring data from 2012 and 2013 has been assessed against a 0.1ug/l standard consistent with the Drinking Water Regulations in the UK. Where the data shows any exceedance of a pesticide standard during this period, the WMA is considered "At risk". The results of the risk assessment undertaken in surface waters (shown in Table 4 and Figure 5 below) supports the results seen in the groundwater status classification (see Section 3.5).

Table 4: Pesticide Risk Assessment Results

Water Management Area	Pesticide Risk Assessment
WMA1 - Grands Vaux, Vallée des Vaux and St Helier	At risk
WMA2 - La Haule and St Peter's Valley	At risk
WMA3 - Longueville, Queen's Valley and Southeast	At risk
WMA4 - Northeast	Not at risk
WMA5 - Northwest	At risk
WMA6 - St Aubin, St Brélade and Southwest	Not at risk
WMA7 - St Ouën and West	At risk
WMA8 - Waterworks Valley and Bellozanne Valley	At risk

The pesticide risk assessment for surface waters, coupled with the results of the groundwater chemical status assessment (see section 3.5) indicate that further investigation is needed into the potential pesticide issue on the Island. The assessments are based on limited sampling, and as such it is recommended that this issue is investigated at an Island scale rather than in individual WMAs. By way of comparison, in the 2014 draft River Basin Management Plans, 24% of drinking water protection areas in England are considered to be at risk from pesticides.

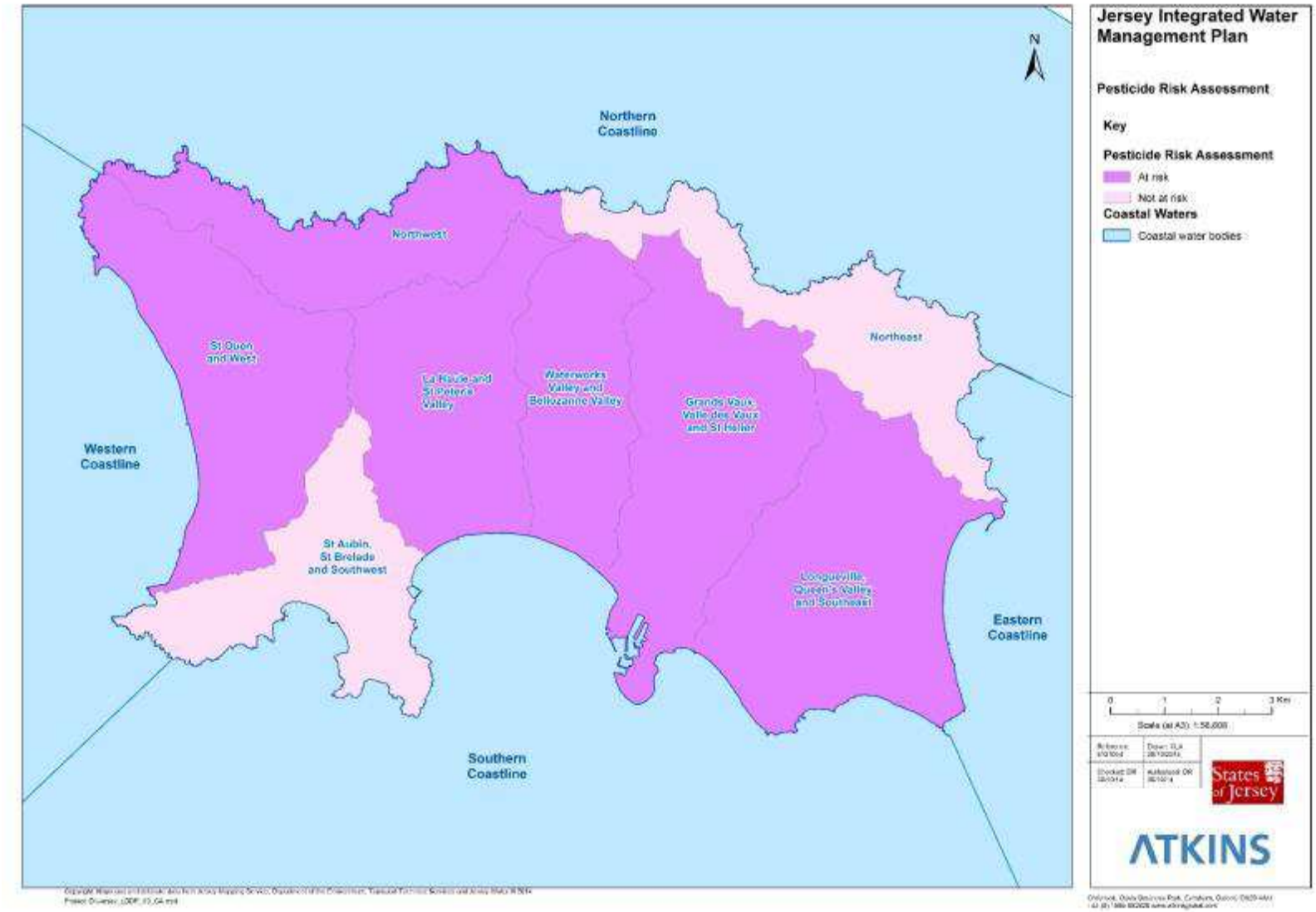


Figure 5: Areas at risk from Pesticides based on available data from 2012-13

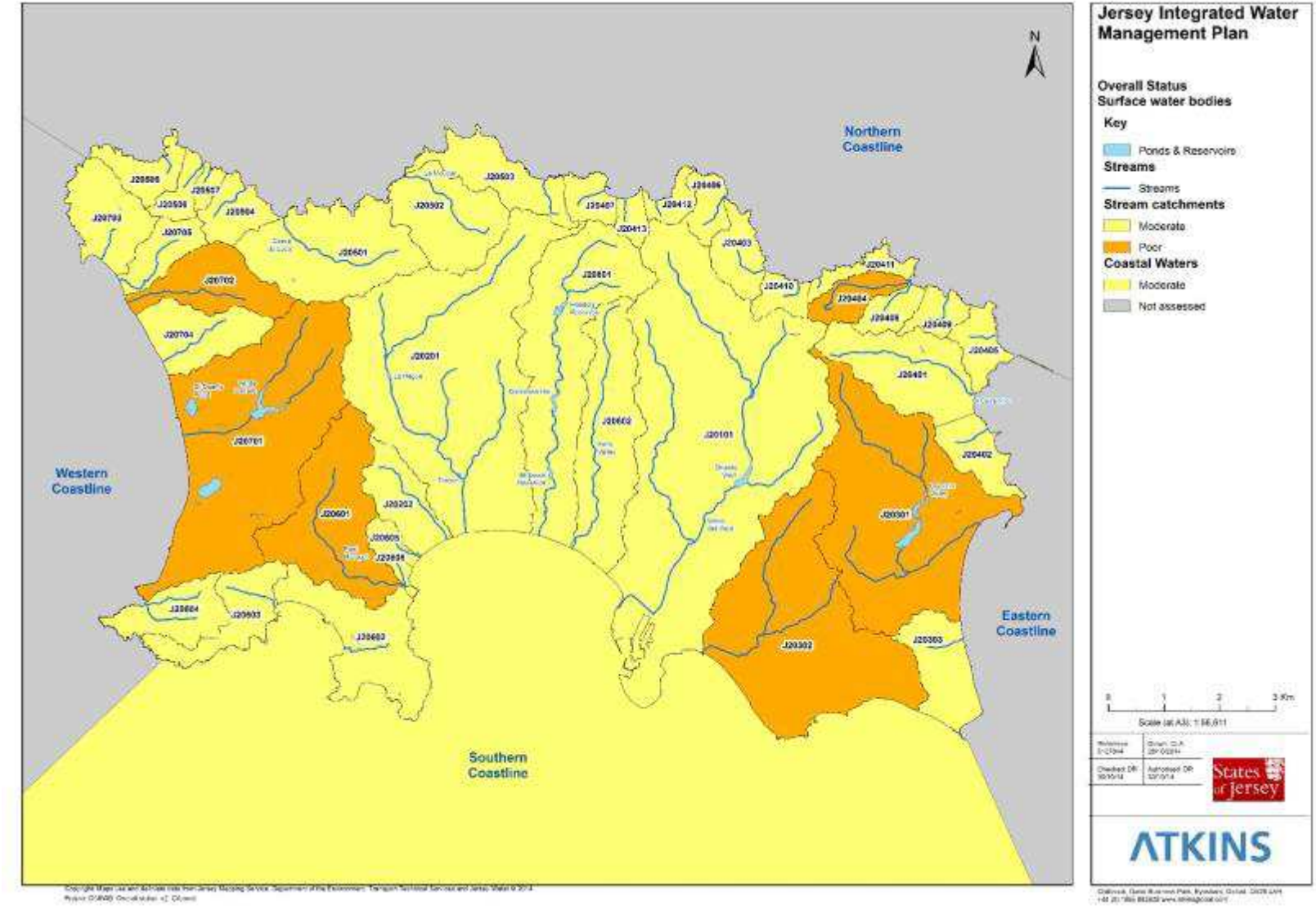


Figure 6: Overall Status in surface waters

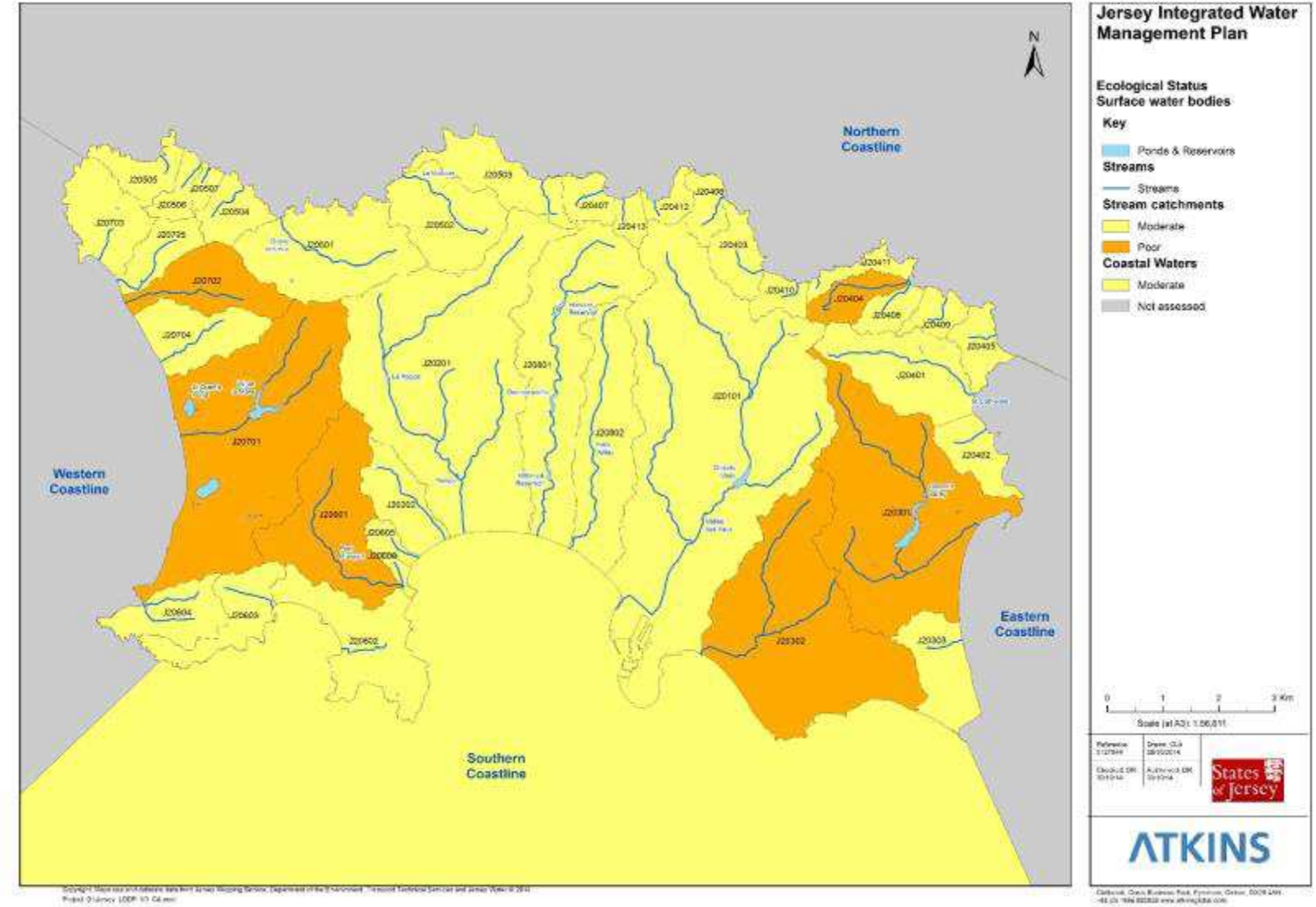


Figure 7: Ecological status in surface waters

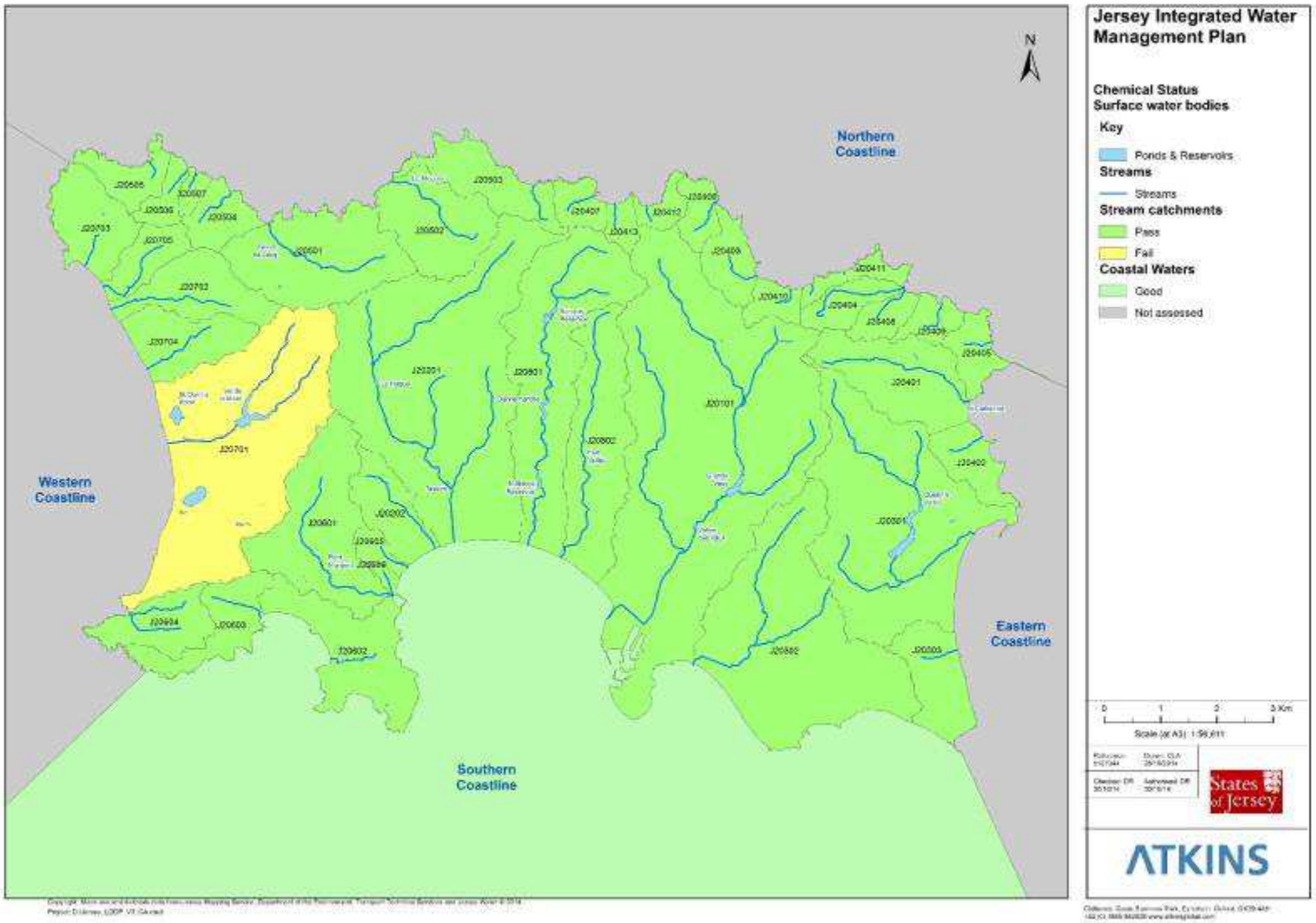


Figure 8: Chemical status in surface waters

Biological status

For the biological classification (based on invertebrates only) there is more variation in status class across the Island. It was not possible to generate a classification for nearly half the stream water bodies due to the absence of monitoring data upon which to base the classification (this is because some catchments, typically the larger ones, are monitored more intensively than the smaller ones).

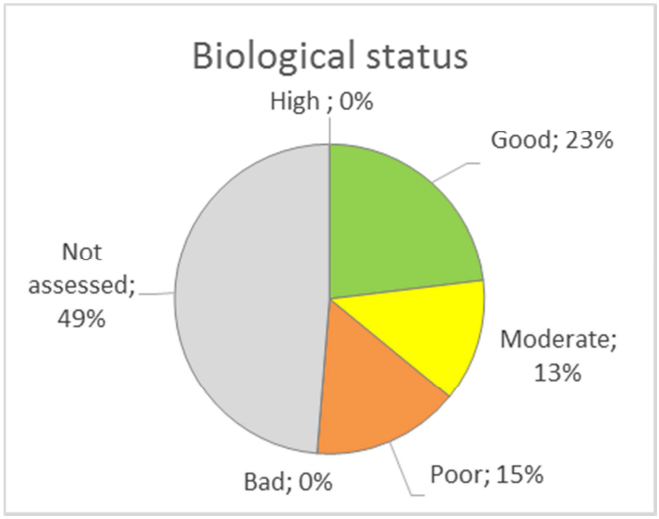


Figure 9: Stream Biology (invertebrate) status classification (as % of total stream water bodies)

However, just over 50% of the Island's streams were classified and of these nearly half of these were considered to be at Good status. (Figure 9). This means 23% of the Island's stream catchment water bodies are at Good status, including: stream catchments draining to Plemont Bay, Greve de Lecq, Mourier and Bonne Nuit Bay on the north of the Island; one stream catchment flowing into St Catherine's Bay on the north eastern corner of the Island; the stream catchments in Grands Vaux, Vallee des Vaux and St Helier WMA; and finally the stream catchment in Bellozanne valley (within Waterworks Valley and Bellozanne WMA) (Figure 11).

Six streams were considered to be at Poor status for biology; it is these water bodies that are driving the Poor status seen in the combined classification assessments for Overall Status and Ecological Status. The biological classification assessment in all Jersey's streams are considered to have been made with high or moderate confidence as the invertebrate monitoring programme is well established.

No water bodies were considered to be at High status. Previous reviews of stream macroinvertebrate status on the Island which showed three water bodies to be achieving High status; however it should be noted that the two methods use slightly different approaches.

Nitrate status

The nitrate assessment has shown that the majority of streams on the Island are at less than Good status for nitrates (Figure 10). This is consistent with the current understanding of the widespread nitrate problem on the Island as a result of diffuse source inputs.

There was sufficient data available to undertake a nitrates classification on all stream catchment water bodies. Out of the 39 stream water bodies assessed, five are at Good status. These include stream catchments on the eastern outskirts of St Helier (near Longueville); Waterworks Valley; and St Peter's Valley (Figure 12).

Due to the human health concerns of nitrates in water sources, nitrates are reasonably well monitored on the Island and as such there is a good level of data to draw upon; most of the assessments are considered medium confidence.

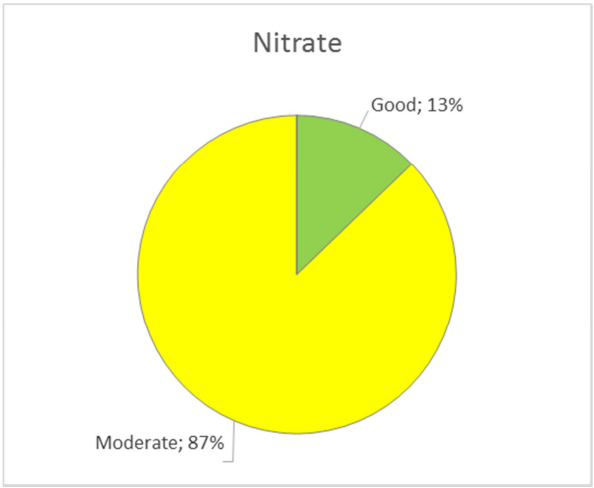


Figure 10: Streams – Nitrate status classification (as % of total stream water bodies)

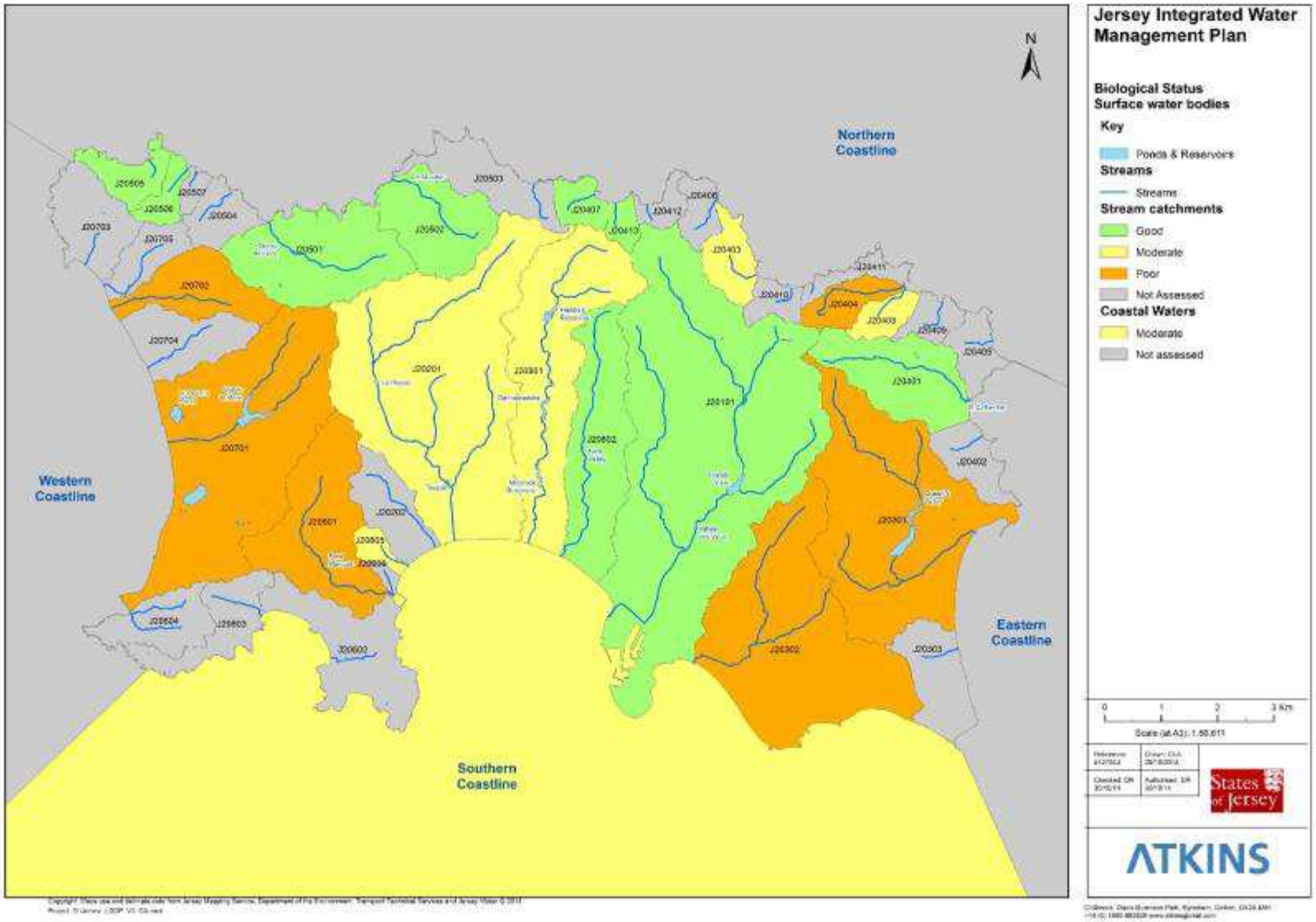


Figure 11: Biological status in surface waters

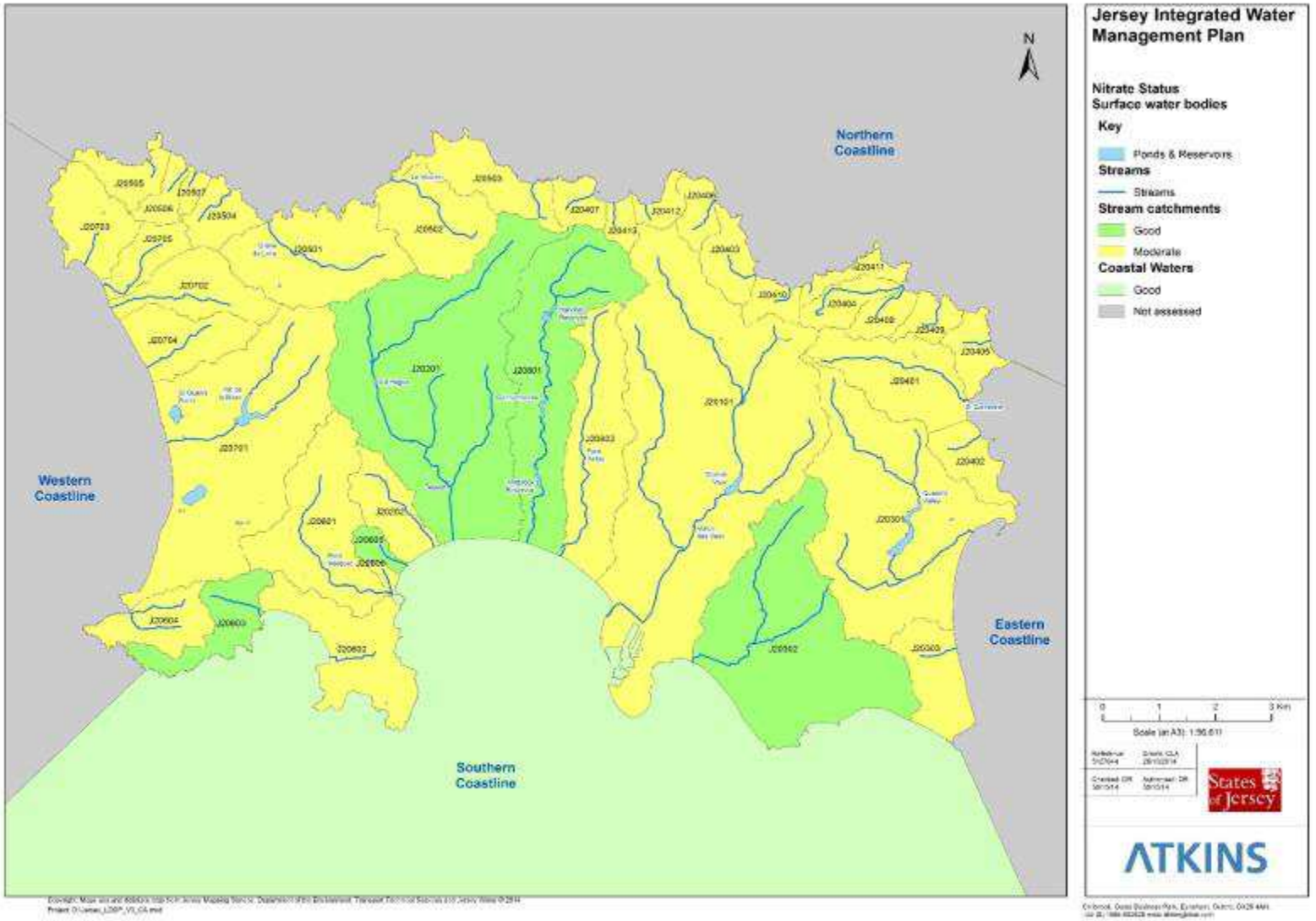


Figure 12: Nitrate status in surface waters

Phosphorus status

Phosphorus monitoring is not widespread or longstanding on the Island; furthermore, the limits of detection of the analysis are not low enough to make useful comparisons against the 0.05mg/l standard being used in the classification assessment. As such, the spread of phosphorus monitoring locations and the length of record are limiting the confidence we can place on this assessment; all stream water bodies are assessed as Moderate status (Figure 14) and assigned a low confidence rating. As a stand-alone assessment therefore, this adds limited value to the overall understanding of phosphorus on the Island. However, the biological monitoring programmes as part of the wider ecological classification will indirectly monitor the levels of phosphorus as well as the broader spectrum of nutrients.

Ammonia status

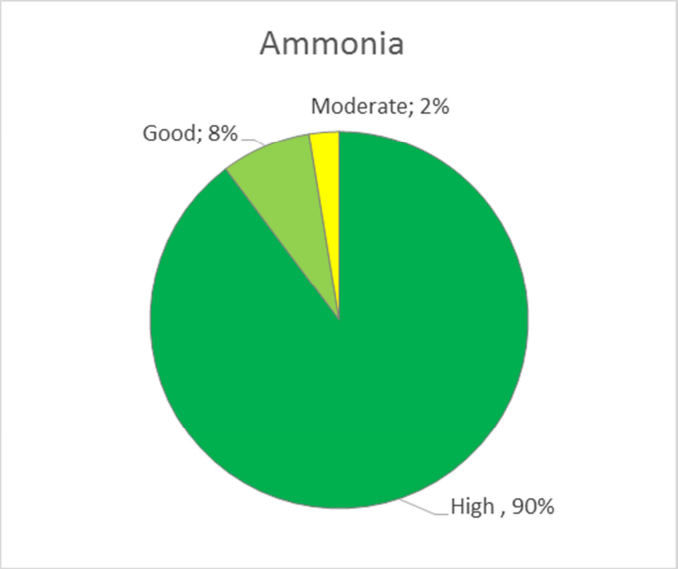


Figure 13: Streams – ammonia classification (as % of total stream water bodies)

The ammonia classification shows that most stream water bodies are at High status (35 water bodies) or Good status (three water bodies) (Figure 13). There is a single water body that is considered to be of Moderate status due to its location downstream of Bellozanne treatment works; in this case expert judgement from States of Jersey Environment Department suggests that it is likely that this would have an impact on the status for ammonia.

Temperature, pH and dissolved oxygen are considered to be of high status in all IWMP stream water bodies.

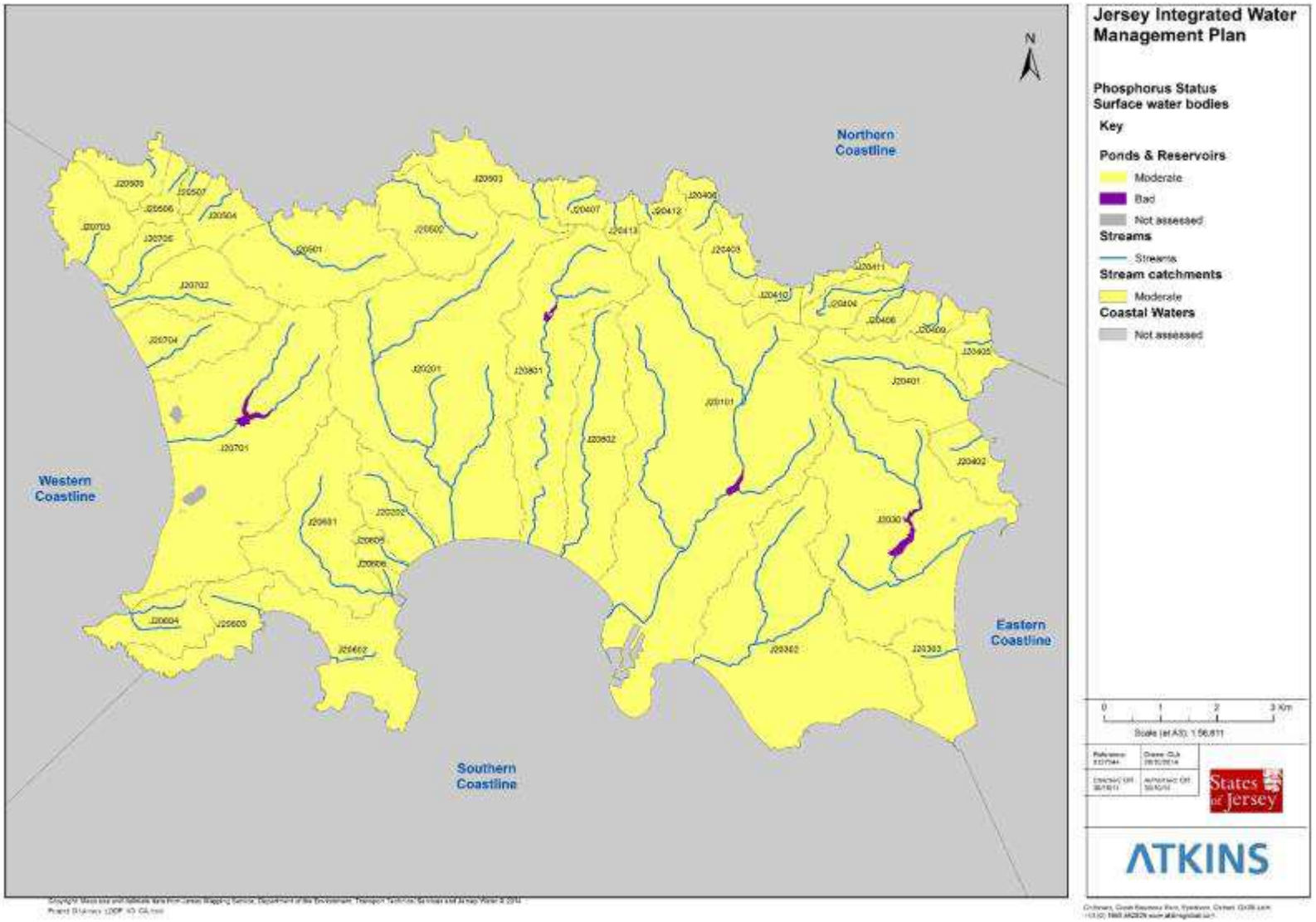


Figure 14: Phosphorus status in surface waters

Hydromorphological Status

Hydrology status (abstraction and flow)

Table 5 shows that the majority of catchments have a 'Slight' impact hydrology status where impacts are generally limited to private abstraction boreholes and land drainage modifications. Three stream catchments have a 'Moderate' impact hydrology status; these are affected by public water supply stream abstraction points in the upper or middle catchments. There are other stream abstraction locations on the Island but these are found close to the coast and have limited impact on the overall hydrology of the streams and have been classed in the 'Slight' impact category.

Four of the stream catchments on the Island have a 'Severe' impact hydrology status due to the presence of the six main water supply reservoirs in the catchments, and the location of groundwater abstractions. Three of the reservoirs are found in the Water Works Valley.

Table 5: Hydrology status classification summary for Jersey catchments

Hydrology	No. stream catchment water bodies	Total length of stream in water body	Comments
Severe	4	61 km	These are the large catchments which contain the six main water supply reservoirs, and the borehole abstraction in the south west part of the island
Moderate	3	28 km	These catchments have stream abstraction points for water supply in the upper catchment, affecting flows downstream.
Slight	32	14 km	The numerous small catchments with limited water resource potential are generally not heavily abstracted

Morphology status (Physical modifications)

Table 6 shows that just under two thirds of the stream catchments on the Island are classified as having a 'Slight' or 'Moderate' proportion of morphology impact encompassing approximately 4 km of water course. About one third of the stream catchments have a larger proportion of modification from urbanisation, reservoirs and /or stream abstraction points. The four stream catchments which contain the six main water supply reservoirs are classified as having 'Severe' impacts for modification as are the large urbanised catchments surround St Aubin's Bay. Morphology pressures are presented in Figure 15 below.

Table 6: Morphology status classification summary for Jersey's stream catchments

Morphology status	No. stream catchment water bodies	Length of stream modified	Comments
Severe	14	16 km	The large streams on the island are generally modified due to urban extent or reservoir impoundments
Moderate	12	3 km	
Slight	13	<1 km	Many of the small streams across the island, particularly to the north are largely un-modified

Status assessments for sediment have not been undertaken because this parameter is not currently monitored. Similarly, work is underway to understand the extent of impact from invasive non-native species (States of Jersey Natural Environment Team) and as such this aspect is not assessed here.

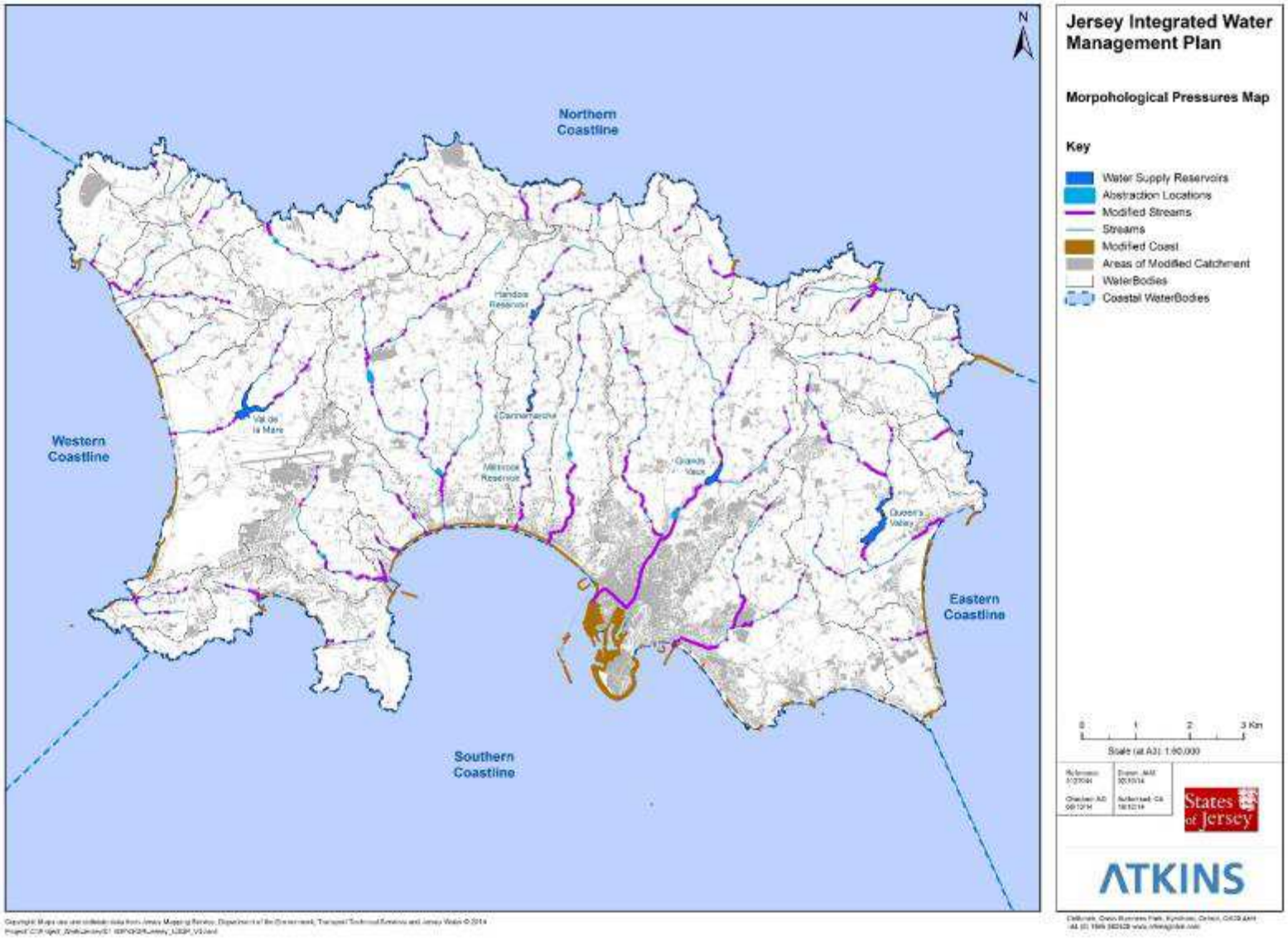


Figure 15: Morphological pressures map

Confidence of assessment

The classification assessments Reporting confidence in a status classification does not affect or change the status; however it is useful for prioritising strategic actions such as improving a monitoring programme where the confidence is low or pursuing action on the ground where we have a reasonable level of confidence.

Table 7 summarises the confidence across all surface water classification elements on the island. It shows that the specific pollutants, dangerous substance chemicals and phosphorous have low confidence in all the stream catchments. This is primarily due to many of these chemicals currently not being monitored in the stream catchments. The other chemicals (pH, ammonia, dissolved oxygen, temperature and nitrate) and invertebrates have been monitored in a risk-based manner; sites with little risk of diffuse or point source pollution have not been monitored or are not assessed in these catchments. Confidence values assigned relate to the frequency and duration of monitoring at the sites used for classification and gives an indication of the amount of data that has been used to base the assessment on.

Table 7: Confidence summaries for stream catchment assessments

		Biology	Nitrates	Phosphorous	Temperature	Dissolved Oxygen	Ammonia	pH	Specific pollutants	Dangerous substances
Confidence	High	6	0	0	0	0	0	0		
	Medium	14	22	0	21	13	17	21		
	Low	0	17	39	18	26	22	18	39	39
	Not assessed	19	0	0	0	0	0	0		

The status classification results can be seen in full in Technical Appendix B (as tables).

3.3 Jersey's Reservoirs and Ponds

3.3.1 Introduction

There are six main water supply reservoirs on Jersey, located in four of the Island's major catchments. These are: Millbrook; Val de la Mare; Handois; Queen's Valley; Dannemarche; and Grands Vaux and they have all been included as part of the IWMP water body dataset and are assessed as part of this classification process. There are another nine surface water abstractions (and associated storage reservoir) across the Island which supply the main water supply reservoirs.

Aside from the main reservoirs and abstraction locations, the Island also has a vast number of smaller reservoirs and ponds which could be of ecological importance, either currently or in the future. It was not considered feasible to include every pond on the island (such as garden ponds for instance) as individual water bodies in their own right. Instead a selection process was undertaken using various data sources and professional judgement by DoE staff that considered the known ecological significance of a pond. This method included selection of those that fulfil two or more of the following criteria:

- are within an SSI boundary;
- have recent records (2003 or later) of protected species within 100 m of them;
- have recent records (2003 or later) of biodiversity action species within 100 m of them; or
- have recent records of toads breeding in them.

Ponds in urban areas were then excluded, which left a total of 53 ponds of known ecological importance in addition to the main water supply reservoirs (Figure 16, Table 8).

This does not mean that other ponds are not considered under the IWMP; these are all still part of the defined catchment water bodies and as such will be afforded consideration in the future Management Plan.

Table 8: Ponds and reservoirs in each WMA

Water Management Area	Number of lakes / ponds	Total area of IWMP lakes /ponds (m^2)
WMA1 - Grands Vaux, Vallée des Vaux and St Helier	10	53278
WMA2 - La Haule and St Peter's Valley	3	831
WMA3 - Longueville, Queen's Valley and Southeast	3	118284
WMA4 - Northeast	4	1691
WMA5 - Northwest	4	1839
WMA6 - St Aubin, St Brélade and Southwest	12	6425
WMA7 - St Ouën and West	18	242875
WMA8 - Waterworks Valley and Bellozanne Valley	5	64176

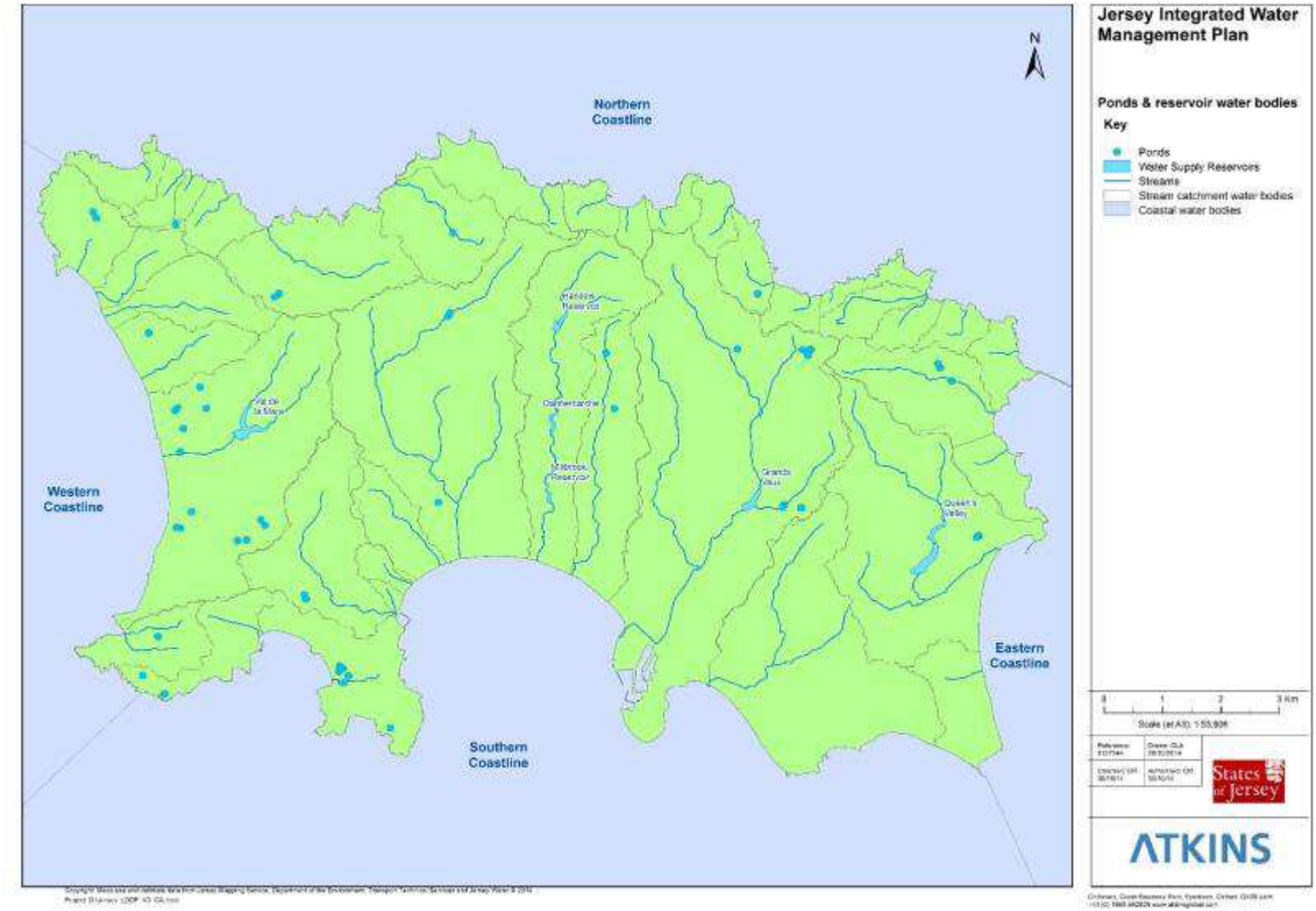


Figure 16: Jersey's Ponds and Reservoir water bodies

3.3.1 Current status of Jersey's ponds and reservoirs

Classification approaches in England and Wales, and also France, were reviewed as part of formulating a classification approach for reservoirs and ponds on Jersey. Both countries undertake classification based on comparing monitoring data with quality standards for eight quality elements including for example: phytoplankton, nitrogen, phosphorous; dissolved oxygen; macroinvertebrates; macrophytes and acid neutralising capacity.

The water supply reservoirs and some reservoirs are monitored for water quality; however other small reservoirs are not monitored routinely and some don't currently have any monitoring data to draw upon for a classification. This has limited the number of ponds and reservoirs for which we are able to generate a status classification.

Phosphorus data have been used to undertake a status assessment where data is available. Five of the six water supply reservoirs have phosphorus monitoring data which indicate that none of these are achieving the required standard for Good status. Millbrook reservoir is Moderate status and the other four main water supply reservoirs (Grands Vaux, Queens Valley, Val de la Mare and Handois) are all at Bad status for phosphorous. No data were available for Dannemarche and so a precautionary approach was taken to assign a Moderate status for this water body too.

Due to insufficient water quality data records in the remaining ponds, it was not possible to undertake a status assessment and as such these have all been marked as 'not assessed'. The limited data available also means that the confidence in this assessment is low and future iterations of the IWMP will seek to enhance our understanding of the classification status in these water bodies.

The results of the pond classification process are available in Figure 17 below. Additional details on the data analysis, classification and recommendations for future monitoring can be found in Appendix A, Section 1.7.

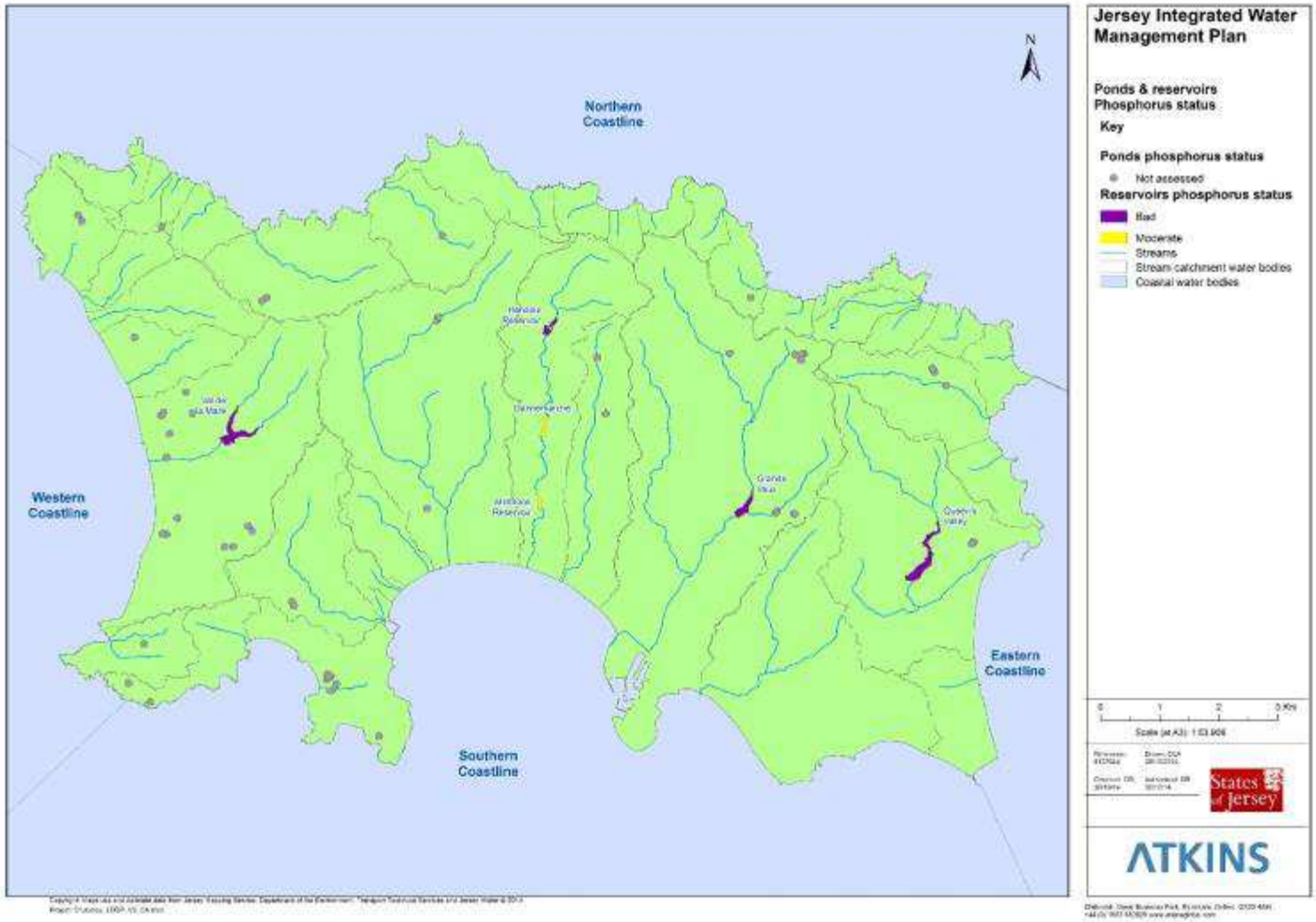


Figure 17: Ponds and reservoirs phosphorus classification results

3.4 Jersey's coastal waters

3.4.1 Introduction

The Island of Jersey is surrounded by approximately 50 miles of varying coastline, from sheer cliffs and rocky shores to sandy beaches. These provide multiple habitats for marine life and varied environments for human activity.

Coastal waters are integrally linked to inland waters and are therefore an important aspect of the IWMP, and their recognition and inclusion within this process will enable a holistic approach to managing and protecting the Island's water bodies, providing a mechanism to monitor, assess and protect coastal water quality in light of the inputs of diffuse and point source pollutants.

To assist with the classification process the coastline has initially been divided up into four suggested water bodies as follows:

- Northern coastline
- Eastern coastline
- Southern coastline
- Western coastline

These are shown simplistically below in Figure 18 or in more detail relative to the freshwater catchments in Figure 1. The area for the coastal water bodies ranges from the high water mark to the 3 nautical mile limit.

These coastal delineations are preliminary (Source DoE, 2014) and will need to be refined over the Plan period to better reflect the characteristics, pressures, inputs and expected quality in each coastal water body..

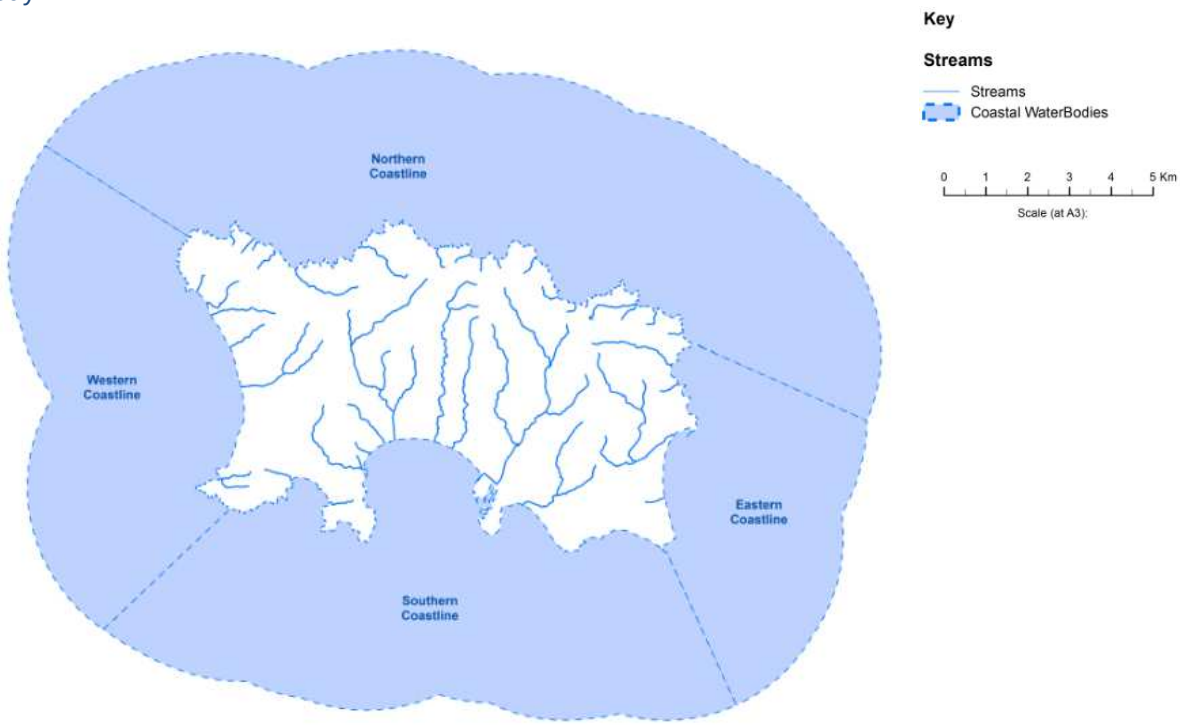


Figure 18: Jersey's Coastal Water Bodies

3.4.2 Current status of Jersey's coastal waters

A Water Framework Directive based system of coastal monitoring and classification has already been developed in Jersey for St Aubin's Bay (Southern Coastline water body). This coastal classification system assigns a class status for each of the following elements: dissolved oxygen; total inorganic nitrogen; phytoplankton; macroinvertebrates; seagrass; and seaweed. These individual assessments are then combined into status assessments for: physico-chemical; biology; chemical; ecological; and overall. The monitoring for the status assessment of St Aubin's Bay is being carried out over a three year period ending in October 2015 and these data have been used to drive the interim classification of this water body.

This assessment only applies to the southern coastline water body because monitoring of the ecological and chemical status of the other three coastal waters bodies has not been undertaken. For the purposes of this document they will be described as 'not assessed' until such time their status can be verified. All other coastal water bodies have not been assessed because there is no data available. Over the course of the first IWMP cycle, it is recommended that monitoring is undertaken to allow classification of the remaining three coastal water bodies.

The results of the individual assessments are given in Table 9 below, and the combined assessments follow in Table 10. The coastal classifications are also shown in Figure 6, Figure 7, Figure 8, Figure 11, Figure 12 and Figure 14.

Table 9: Coastal classification results: individual assessments

Name	Dissolved Oxygen	Total Inorganic Nitrogen	Phytoplankton	Macro-invertebrates	Sea Grass	Seaweed
Southern coastline	High	Good	High	Good	High	Moderate
Northern coastline	Not assessed	Not assessed	Not assessed	Not assessed	Not assessed	Not assessed
Eastern coastline	Not assessed	Not assessed	Not assessed	Not assessed	Not assessed	Not assessed
Western coastline	Not assessed	Not assessed	Not assessed	Not assessed	Not assessed	Not assessed

Individual assessment shows the Southern Coastline coastal water is achieving High status for dissolved oxygen, phytoplankton and seagrass. Good status is being achieved for total inorganic nitrogen and macroinvertebrates. The seaweed assessment indicates Moderate status, and it is understood that the failure to achieve Good can be attributed to the ecology data (opportunistic and macroalgae assements). This is predominantly the growth of Ulva, indicating the potential impact of inflowing nutrients from land based sources.

Table 10: Coastal classification results: combined assessments

Name	Physico-chemical class	Biology class	Specific Pollutants class	Chemical class	Ecological class	Overall status	Notes
Southern Coastline	**Good** (high confidence)	**Moderate** (high confidence)	**Good *** (High confidence)	**Good **** Moderate confidence)	**Moderate**	**Moderate**	Benzo (g,h,i) perylene and TBT were found to be failing to achieve the chemical standard. In the case of TBT, the failure was due to a spike in one water sample; follow up assessments on the imposex of Dogwhelks was carried out which found very low levels of Imposex. The failure of Benzo (g,h,i) perylene may be due to limit of detection restrictions rather than a true failure occurring. Expert judgement has been used to conclude a Pass for these two chemicals
Northern coastline	**Not assessed**	**Not assessed**	**Not assessed**	**Not assessed**	**Not assessed**	**Not assessed**	
Eastern coastline	**Not assessed**	**Not assessed**	**Not assessed**	**Not assessed**	**Not assessed**	**Not assessed**	
Western Coastline	**Not assessed**	**Not assessed**	**Not assessed**	**Not assessed**	**Not assessed**	**Not assessed**	

* - 15 Specific Pollutants assessed
** - 19 Hazardous Substances assessed

When the individual classification results are presented in the combined assessments, Good status for the physico-chemical, specific pollutants and chemical status assessments is achieved. The Moderate status result for seaweed is driving down the biological classification status to Moderate, despite many of the component parts being at Good or High status, and this results in ecological and overall status being assigned as Moderate.

Morphology

To understand how coastal modifications may be affecting the status of the coastal water bodies, a high level morphology status assessment has been undertaken for the coastline, which considers the presence, or absence, of features including coastal defences, sea walls, ports and harbours and other modifications for example piers. The results of this assessment are given in Table 11 below and shown in Figure 15 previously. This assessment does not form part of the overall combined assessments but is a useful indicator of the degree of modification of the coastal waters, the uses of coastal waters on Jersey and therefore the pressures acting upon them.

Table 11: Morphology status for coastal waters

Name	Morphology status	Reason
Southern Coastline	**Poor**	Coastal defences and sea wall along most of St Aubin's Bay; port at St Helier; reclamation site at La Collette.
Northern coastline	**Good**	Most of the coastline is rocky shore and although there are some modifications, these are generally localised around specific small bays.
Eastern coastline	**Moderate**	Coastal defences and sea wall sporadically along the Bay of Grouville, although the north of Gorey there are fewer coastal modifications (rocky shore interspersed with small sandy bays)
Western Coastline	**Poor**	Coastal defences and sea wall along most of St Ouen's Bay

3.5 Jersey's groundwaters

3.5.1 Introduction

Jersey's groundwater and surface waters are sourced by rainfall over the Island and are best considered as a single interactive system. The useable groundwater resource is shallow and overlain for the most part by thin highly permeable soils and hence is vulnerable to pollution from human activities. At the same time, groundwater plays a vital role in providing support to many streams, wetlands and ponds through periods of low rainfall. In addition, groundwater is abstracted for private domestic supplies and for use in agriculture, horticulture and for leisure and amenity purposes. During the 1980s and 1990s a series of studies and investigations into groundwater resources and pollution were undertaken by the British Geological Survey, culminating in the Jersey Groundwater Study (BGS, 1998) and an overview of Jersey's Water Resources (BGS, 2000), which have greatly increased understanding of Jersey's groundwaters. In Jersey the Water Pollution (Jersey) Law 2000 provides the framework for improving chemical status, and the water abstraction licensing and registration systems introduced since 2010 provide new information on the abstraction and use of groundwater across the Island.

The first step in the assessment of Jersey's groundwaters is to define suitable management units. Groundwater bodies are typically larger than individual groundwater bodies and for Jersey, in recognition of the close linkages between groundwater and surface waters, the eight surface Water Management Areas (WMAs) have been used to define groundwater bodies. For the most part groundwater is held in fractures in metamorphic and igneous aquifers, the exception to this being superficial sand aquifers in the west and south east of the island.

3.5.2 Current status of groundwaters

Approach

European and UK guidance has been referred to and adapted to be suitable to the Jersey situation, as explained in the groundwater section of Appendix A. This has resulted in the use of four overall tests covering groundwater quantitative and chemical status shown in Figure 19. These have been applied to each of the eight Water Management Areas (WMA).

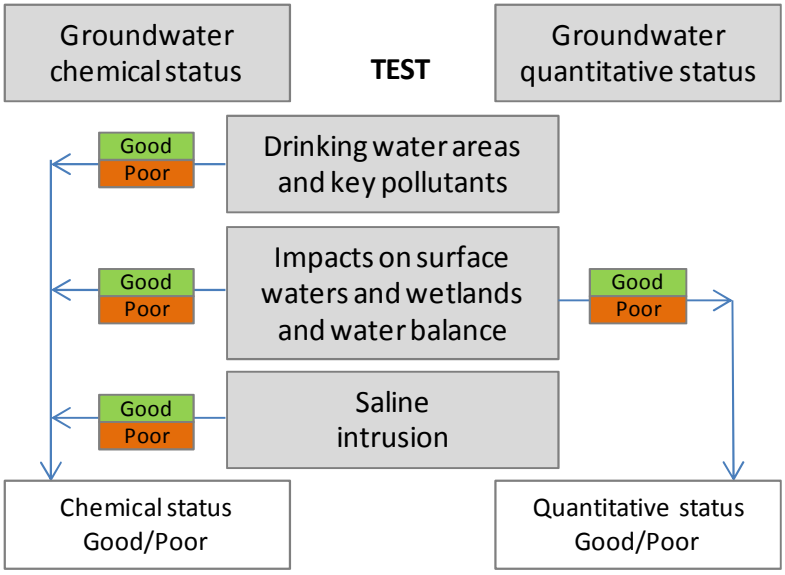


Figure 19: Overview of groundwater status tests

A brief summary of the approach to these tests is provided below. Full details of the tests are given in Technical Appendix A.

Groundwater Quantitative Status

It is important that abstraction for human use does not unacceptably compromise the function of groundwater in supporting streams and wetlands. It is difficult to quantify precisely the amount of groundwater that is supporting streams and wetlands and even more difficult to estimate the impact of abstraction on these natural processes. The groundwater quantitative test criteria have been determined drawing on experience of detailed water balance and impact assessments elsewhere (Grout, 1998, Atkins, 2010). The test is based on the amount of groundwater abstraction as a percentage of long term average recharge in the Water Management Area (WMA) and is supported by evidence for groundwater impacts on streams and wetlands and any evidence for saline intrusion.

Groundwater Chemical Status

Compared with the test for quantitative status the tests for groundwater chemical status are more complex. In Jersey, three component tests relating to drinking water, dependent surface water systems and saline intrusion have been used. For each of these tests, relevant parameters need to be identified and 'criteria values' defined. 'Natural background levels' are then taken into account and 'threshold values' determined that if exceeded indicate the need for further investigation.

The next consideration is how to analyse the available monitoring data across the WMA in order to compare it with the threshold value. In Jersey, a five year data set has generally been used for screening but longer data sets have been used for nitrates and indicators of saline intrusion where an analysis of trends is an important part of the classification. For pesticides the most recent two full years of data (2012

and 2013) have been used to capture the most recent situation. If more than 20% of the sites in the WMA fail the screening criteria then the test is failed for that parameter.

Groundwater quantitative status results

Long term average recharge in each WMA has been estimated by adjusting the Island average of 132 mm per year reported in BGS (1998) to take account of differences in rainfall across the Island. Annual groundwater abstraction has then been estimated using information from the licensing and registration system that was introduced in 2010.

Table 12 summarises a breakdown of estimated recent actual groundwater abstraction in each WMA by type of use. The estimated total recent actual groundwater abstraction in each WMA is then compared with the long term average recharge estimate in Table 13 which also summarises the classification result and confidence. Where abstraction is between 20% and 40% of long term average recharge the confidence in the good status is low, whereas if it is below 20%, confidence is high. Based on discussion with specialists in the Department of Environment, there is no specific evidence of detrimental impacts on streams or wetlands or long term groundwater level declines. In addition, there is no current evidence of saline intrusion (see following section) and hence the results are that groundwater quantitative status is good in all WMAs (Figure 21).

It is important to note that although groundwater quantitative status is assessed as good, this does not mean that there are no abstraction pressures on groundwater, or that groundwater resources will not become stressed during droughts. Information collected since the introduction of the licensing system has significantly improved understanding of the actual rates of abstraction and has shown for example that dewatering activities around quarries involve relatively high rates of abstraction. In reality, this water is likely to be a mixture of run off and groundwater that is extracted from sumps and pits at times of relatively high groundwater levels. Nonetheless, these types of activity and any extensions should continue to be subject to environmental assessments as they have been in the past.

In addition, it should be noted that the St Ouen public water supply well field abstraction is very variable depending on the need to top up the Val de Mare reservoir. Recent actual abstractions averaged over 2011 to 2013 are only around 30% of the annual licence, so there is potential for additional stress if abstraction were to increase during dry periods. More generally, with regard to the availability of groundwater resources during drought, it is recommended that this is considered further through a drought plan or similar process.

Table 12: Estimated recent actual groundwater abstraction by WMA and use type

Water Management Area	Abstraction TCMA								
	Agriculture	Amenity	Business	Business PWS	Business Dewatering	Domestic	Horticulture	Public Service	TOTAL
Grands Vaux, Vallée des Vaux and St Helier	41	31	124	0	0	84	24	22	326
La Haule and St Peter's Valley	21	1	61	18	236	74	8	0	420
Longueville, Queen's Valley and Southeast	62	21	63	0	0	74	6	0	226
Northeast	15	0	8	0	0	100	0	0	124
Northwest	16	0	8	0	235	49	0	1	309
St Aubin, St Brélade and Southwest	10	78	24	0	0	29	11	1	154
St Ouën and West	43	8	82	114	156	90	0	8	502
Waterworks Valley and Bellozanne Valley	33	1	17	0	0	51	1	0	102
Totals	242	140	387	132	627	552	50	32	2163
Percentage contribution by use	11%	6%	18%	6%	29%	26%	2%	1%	100%

TCMA = Thousand metres cubed of water per annum

Table 13: Total estimated recent actual groundwater abstraction relative to long term average recharge

Water Management Area	Abstraction TCMA	Abstraction as % of recharge		Other evidence			Classification	
	TOTAL	LTA recharge TCMA	GW use as % of LTAR	Regional GW Level decline?	SW or wetland impact?	Saline intrusion ?	Status	Confidence
Grands Vaux, Vallée des Vaux and St Helier	326	4593	7%	N	N	N	Good	High
La Haule and St Peter's Valley	420	1989	21%	N	N	N	Good	Low
Longueville, Queen's Valley and Southeast	226	2241	10%	N	N	N	Good	High
Northeast	124	1626	8%	N	N	N	Good	High
Northwest	309	1268	24%	N	N	N	Good	Low
St Aubin, St Brélade and Southwest	154	946	16%	N	N	N	Good	High
St Ouën and West	502	1423	35%	N	N	N	Good	Low
Waterworks Valley and Bellozanne Valley	102	2646	4%	N	N	N	Good	High
Totals	2163	16731						

LTAR = Long term average recharge
GW = Groundwater

Groundwater chemical status results

There is a considerable amount of groundwater monitoring data in Jersey which has been drawn upon for this assessment. A number of substances are very rarely encountered in groundwater and hence are not routinely monitored, or have only been monitored at known contaminated sites. As a result, there is only sufficient monitoring information to carry out chemical screening and classification for the parameters shown in Table 14.

Table 14: Summary of groundwater chemical status screening results

Parameter	Units	Reason	Threshold Value (TV) (mean)	Basis of TV	Screening result	Groundwater chemical status
Nitrate NO3	mg/l	DW	37.5	DW	Step 2 required	Poor in all WMAs
1,1,1 - Trichloroethane	µg/l	DW	7.5	DW	Pass	Good
1,1,2,2 - Tetrachloroethane	µg/l	DW	7.5	DW	Pass	Good
Vinyl chloride	µg/l	DW	0.375	DW	Pass	Good
Pesticides (individual)	µg/l	DW	0.075	DW	Fail in 4 WMAs	Poor in 4 WMAs
PFOS	µg/l	SP	0.00065	SW	Fail St Ouen WMA	Poor St Ouen WMA
Phosphate	µg/l	SW	50	SW	Unknown	Unknown
Salinity	µS/cm	Sal	744-1203	NBL	Step 2 required	Good
Sulphate	mg/l	Sal	111-177	NBL	Step 2 required	Good

DW: Drinking Water criterion.
SP: Specific Pollutant
SW: Threshold values based on Surface Water standards for Jersey, see details in Appendix A.
NBL: Natural Background Levels set at 90%ile of site averages for individual WMAs.
PFOS: Perfluorooctane sulfonate – an additive to firefighting foam.
Sal: Saline intrusion.

For substances having a chemical status result of poor some additional explanation is provided below. Considering perfluorooctane sulfonate (PFOS) first, this is an additive to firefighting foam which is a known issue in a number of groundwater sources in the St Ouen Bay WMA and is subject to ongoing monitoring and assessment.

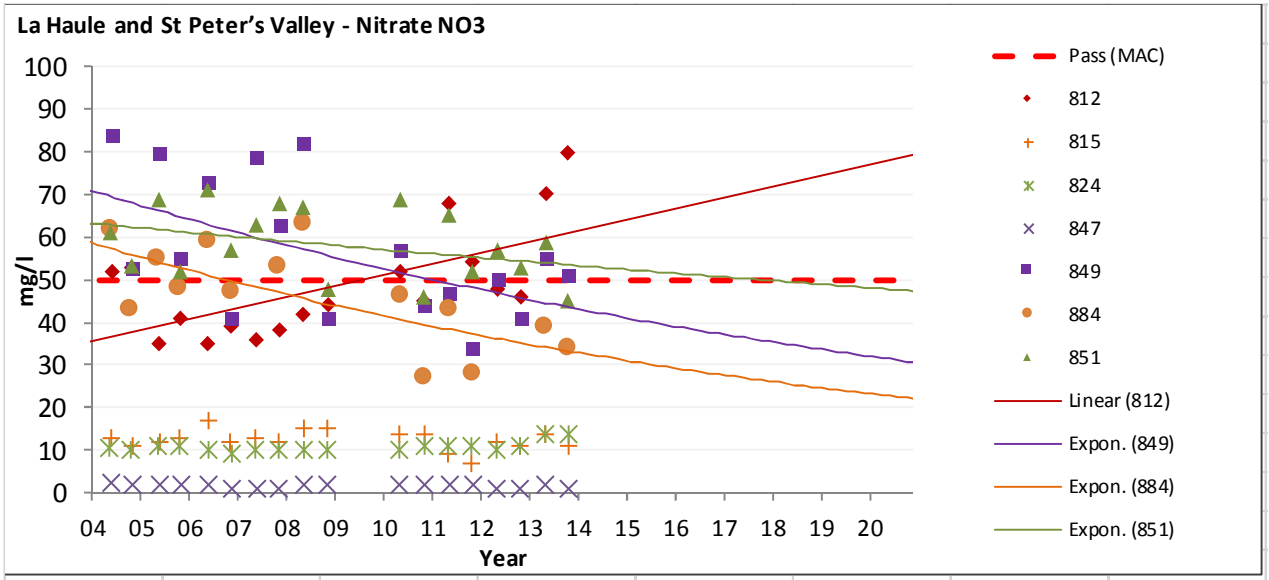
The other two groups of substances with a poor status result are nitrates (Figure 22) and pesticides (Figure 23). These are recognised as the most widespread groundwater contaminants across Europe. For pesticides, the monitoring results for 2012 to 2013 showed that four out of the eight WMAs have sites that show pesticide levels higher than the EC standard for one or more pesticides on one or more occasions. Although the concentrations were normally low, the standard is also very low, so the status result for

pesticides has been assigned as 'Poor' in these four WMAs. The occurrence of pesticides in groundwater is not a new issue in Jersey and is referred to for example in BGS (2000).

Finally, for nitrates the percentage of sites exceeding the threshold value of 37.5 mg/l NO_3 (average) varies between 33% and 100%. This exceeds the recommended 20% so all WMAs fail the screening for nitrate.

A second step of classification has been carried out focusing on trends. In summary, the trend analysis performs a simple prediction of the mean concentration in 2020 and then allows for some of the variability in results over the past 10 years. An example for La Haule and St Peter's Valley WMA is shown in Figure 20 which illustrates the approach used and is summarise below:

- Three sites have stable low concentrations and do not require further analysis.
- Two sites have downward trends and if these continue, even allowing for some variability in the data, concentrations would be expected to be mostly below the Maximum Allowable Concentration (MAC) limit by 2020.
- One site has a downward trend but allowing for some variability it is likely that some values will still fail the MAC limit by 2020.
- One site has an upward trend and unless effective measures are put in place most values are likely to fail the MAC limit by 2020.
- Overall, two out of the seven sites are likely to be failing the MAC standard by 2020 unless further effective measures are put in place, so the nitrate groundwater chemical status for the WMA is 'Poor'.



Sample point ID	812	815	824	847	849	884	851
Predicted mean value in 2020	82	9	12	3	31	22	46
Predicted value in 2020 +SD	94	11	13	3	40	26	57

SD = standard deviation

Figure 20: Trend analysis for groundwaters

It should be noted that as the groundwater monitoring tends to have been focused where there are suspected or known contaminant issues, this may bias the monitoring results and hence the classifications.

Overall, the chemical classification results indicate that nitrates, pesticides and locally PFOS require further consideration in the next stages of the integrated water management planning process. Alongside this, more widespread groundwater monitoring over the course of the IWMP would help understand the baseline groundwater status and remove any potential bias towards monitoring only where there are suspected issues or failures.

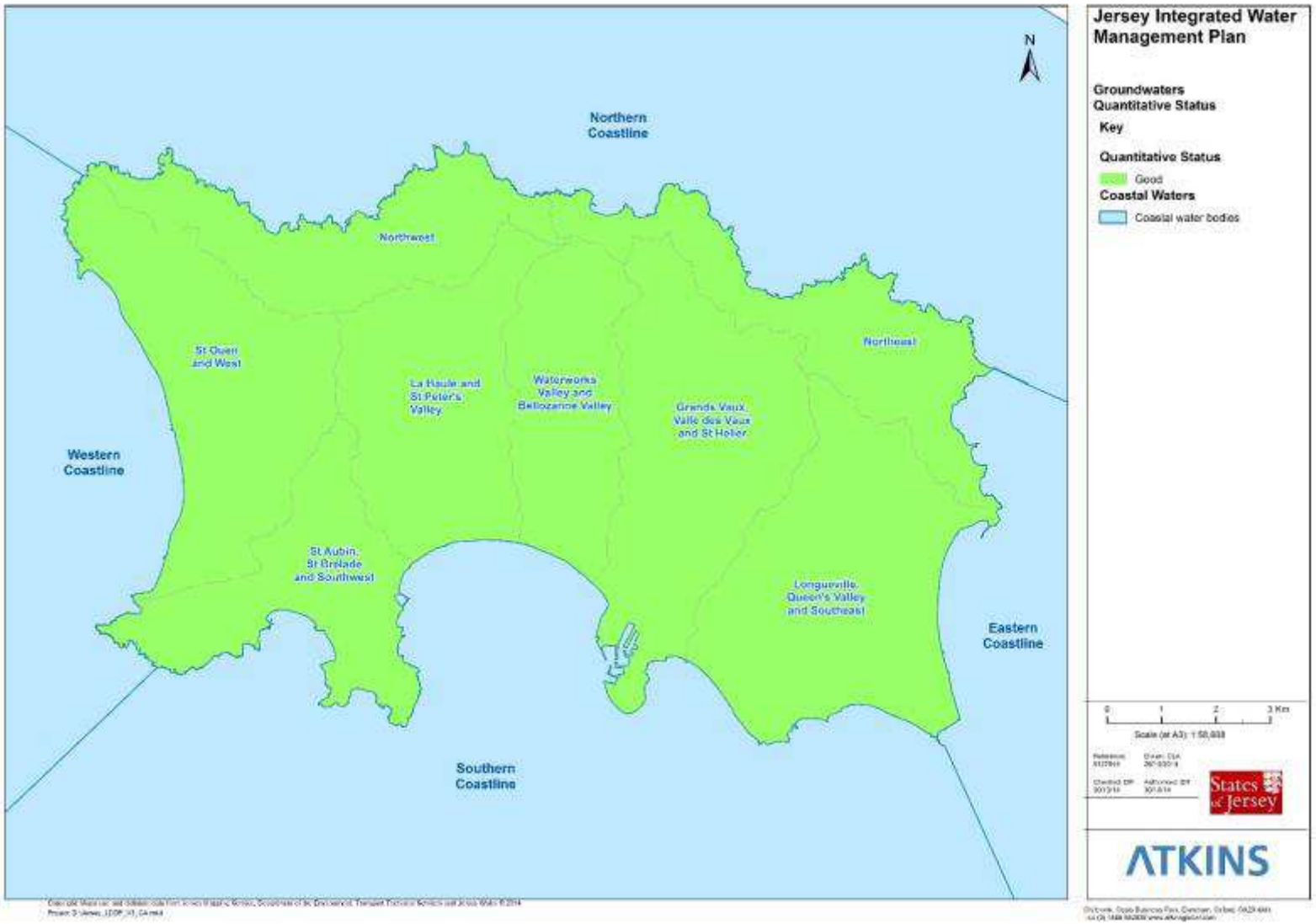


Figure 21: Groundwater Quantitative Assessment Results

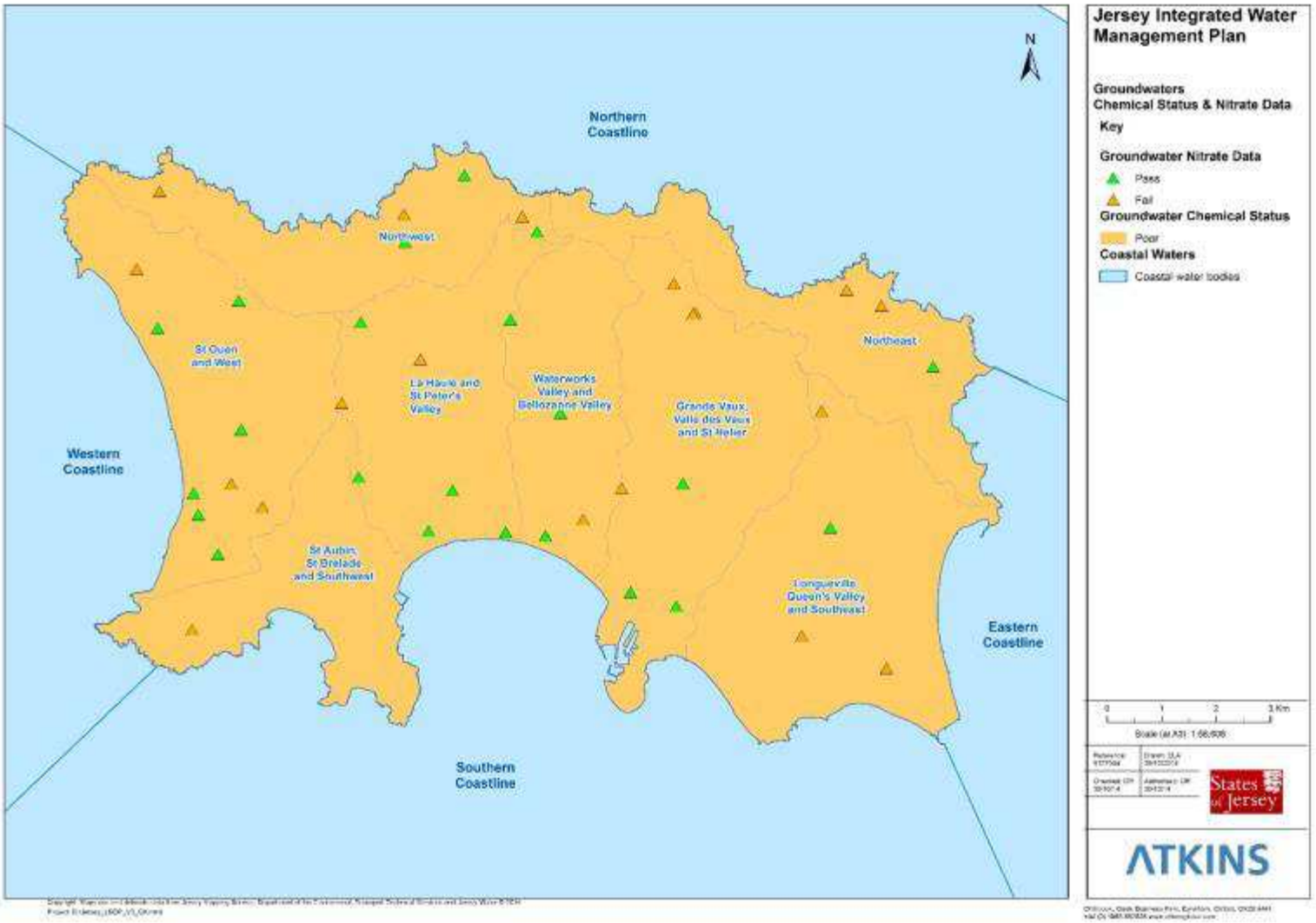


Figure 22: Groundwater Chemical Status and Nitrate Monitoring data

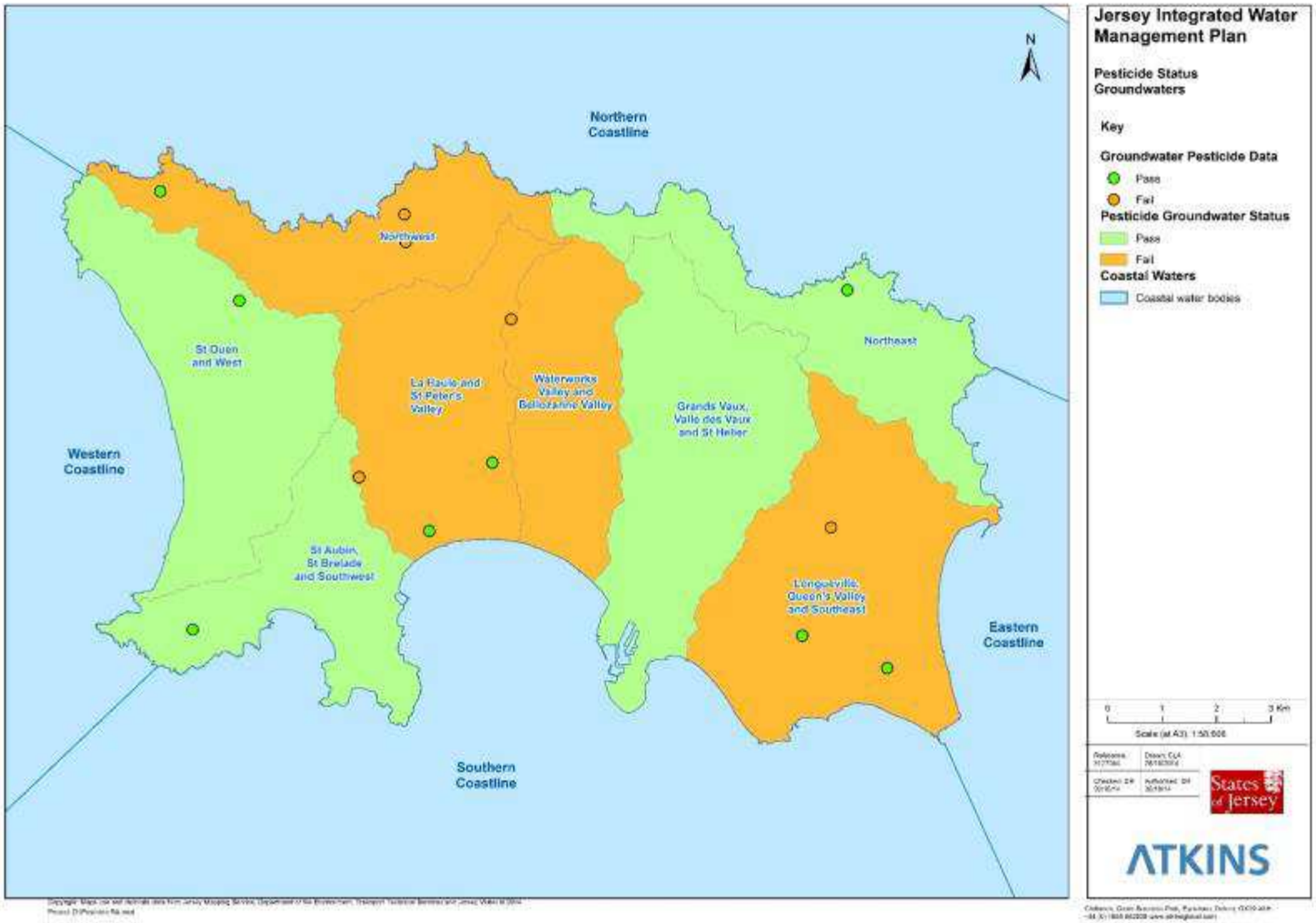


Figure 23: Groundwater Chemical Status and Pesticide Monitoring Data

3.6 Priority Protection Areas in Jersey

Under the Water Framework Directive protected areas have additional quality standards applied to them. Protected Areas are usually designated as requiring a higher degree of protection either for their surface water or groundwater, or to conserve habitats and species that directly depend on those waters.

Elsewhere in Europe for example, water environment related Protected Areas have been established under the following categories:

- Water bodies used for the abstraction of drinking water
- Nutrient Sensitive Areas
- Areas for the protection of habitats and species
- Recreational waters
- Areas designed to protect economically significant aquatic species

Across Europe, many of these Protected Areas include sites that are already designated under existing European Legislation. This isn't straightforward in Jersey where European legislation is not necessarily adopted and these areas are not already in existence. Realistically, resource implications are also paramount and there is a need to avoid additional layers of bureaucracy.

Because of these considerations a pragmatic approach has been adopted for the IWMP, with a system of **Priority Protection Areas** being identified, so that the sites with special features (either features of ecological or social importance) can be afforded priority for action in the future. This will help ensure that where resources are limited, action is targeted according to local priorities.

Water bodies used for the abstraction of drinking water

The protection of waters used for drinking supplies is of paramount importance on the Island. The Priority Protection Areas for Jersey's Drinking Waters category therefore consists of:

- The six main water supply reservoirs;
- The upstream catchments draining into these reservoirs
- The existing water protection safeguard zones; and
- The Island's groundwater bodies.

These areas are shown in Figure 24.

In this way, the water supply water bodies (surface and groundwater) and their upstream catchments can be considered separately for priority protection under the IWMP.

It is currently considered that none of these water bodies are achieving Good Status; the main water supply reservoirs are all failing on account of phosphorus and most stream catchments are failing for nitrates.

Nutrient Sensitive Areas

Jersey has a historic and widespread problem with nutrients, and because of the land use on Jersey the whole Island is potentially vulnerable to nutrient enrichment. As well as all streams and reservoirs / ponds, the groundwaters are equally vulnerable to nutrients. Under the Nitrates Directive, the whole Island would be designated as a Nitrate Vulnerable Zone. In addition to this, the coastal water of St Aubin's Bay would be designated as "Potentially Sensitive" as it is risk from nutrients, both through run off from land and from wastewater discharges to sea. The Nutrient Sensitive Areas are shown in Figure 25.

Areas for the protection of habitats and species

The approach taken to identifying ponds and reservoir water bodies in the IWMP is based on ecological significance for habitats and species; ponds were designated based on whether they are within an SSI, or

have protected species / biodiversity action species records in or nearby. As such, all ponds are considered a Priority Protected Area. In addition to this, Ecological SSIs and where water bodies intersect these sites, are also designated for priority protection.

In the marine environment, the Ramsar site off the south east corner of the Island is also designated for priority protection. Important Seagrass habitats are also protected through the Marine Protected Areas (MPAs) identified. These areas are shown in Figure 26.

Recreational waters

This is an important category for Jersey as locals and tourists alike enjoy a host of water-based activities. As such, it is important that these sites are considered separately. Therefore, this category of Protected Area will consist of:

- Existing designated bathing water beaches
- All coastal waters (which include bathing water beaches and recreational sea fishing areas)
- The main inland water bodies where fishing takes place.

The recreational waters are shown in Figure 27.

Classification of the bathing waters under the IWMP is based on current compliance levels with European standards. Bathing water quality is measured at 16 locations around the coastline, with 20 seawater samples taken for analysis between May and September at each site. These are analysed for faecal indicator bacteria (*Escherichia coli* and intestinal enterococci). In 2013, all 16 bathing waters passed the Imperative Standards for E.coli and 14 of these also passed the more stringent Guideline Standards set out in existing European Legislation. Revised Bathing Water Standards are currently being implemented and will therefore be in force for the duration of the IWMP; as such, the current status of these Recreational Water Protected Areas under the IWMP is assessed against these new standards.

Table 15: Jersey Recreational Waters status assessment

Recreational Water type	Recreational Water name	Current European Directive	New European Bathing Water Directive Standards	IWMP Status Classification
Bathing Water	St Brelade's Bay	Guideline Pass	Good	Good
	Beauport	Guideline Pass	Excellent	High
	Portelet	Guideline Pass	Excellent	High
	St Ouen Le Braye	Guideline Pass	Excellent	High
	Plemont	Guideline Pass	Excellent	High
	Greve de Lecq	Guideline Pass	Excellent	High
	St Ouen Watersplash	Guideline Pass	Excellent	High
	La Haule	Guideline Pass	Good	Good
	Victoria Pool	Guideline Pass	Good	Good
	Grouville	Guideline Pass	Excellent	High
	Archirondel	Guideline Pass	Excellent	High
	Havre des Pas	Guideline Pass	Excellent	High
	Green Island	Guideline Pass	Excellent	High
	Bouley Bay	Imperative Pass	Good	Good
	Rozel	Guideline Pass	Good	Good
	Bonne Nuit	Imperative Pass	Sufficient	Moderate

Coastal Recreational Waters	Coastal Water – North	n/a	n/a	Not assessed
	Coastal Water – East	n/a	n/a	Not assessed
	Coastal Water – South	n/a	n/a	Not assessed
	Coastal Water – West	n/a	n/a	Not assessed
Freshwater Fishing	Queens Valley Fishery	n/a	n/a	Bad (Phosphorus status)
	Val de la Mare Fishery	n/a	n/a	Bad (Phosphorus status)
	Dannemarch Fishery	n/a	n/a	Bad (Phosphorus status)
	Millbrook Fishery	n/a	n/a	Bad (Phosphorus status)
	St Ouen's Pond	n/a	n/a	Not assessed

Source: https://www.gov.je/SiteCollectionDocuments/Environment%20and%20greener%20living/R%202014%20Bathing%20Water%20Report%20Exec%20Summary%20(size%20248kb)%20DM%2020140414.pdf

Areas designed to protect economically significant aquatic species

This category is important in the coastal waters of Jersey which support an important shellfish industry. Areas used for the production of bivalves (e.g. clams, oysters, mussels and scallops) and gastropod (e.g. ormer, whelks etc.) molluscs have been identified as requiring priority protection. These areas are contained within the waters around the Southern and Eastern Coastline coastal water bodies (see Figure 28).

The current status classification of the Southern Coastline coastal water is Moderate, and the status classification of the Eastern Coastline coastal water is not currently assessed. These assessments do not consider microbial water quality and there is no specific water quality monitoring undertaken at the shellfish water locations (although it is understood that tissue samples are subsequently taken to protect human health as appropriate).

In the freshwater environment, fishing is not considered economically important in the same way as in the coastal environment as it is only undertaken on a small scale within some stocked reservoirs.

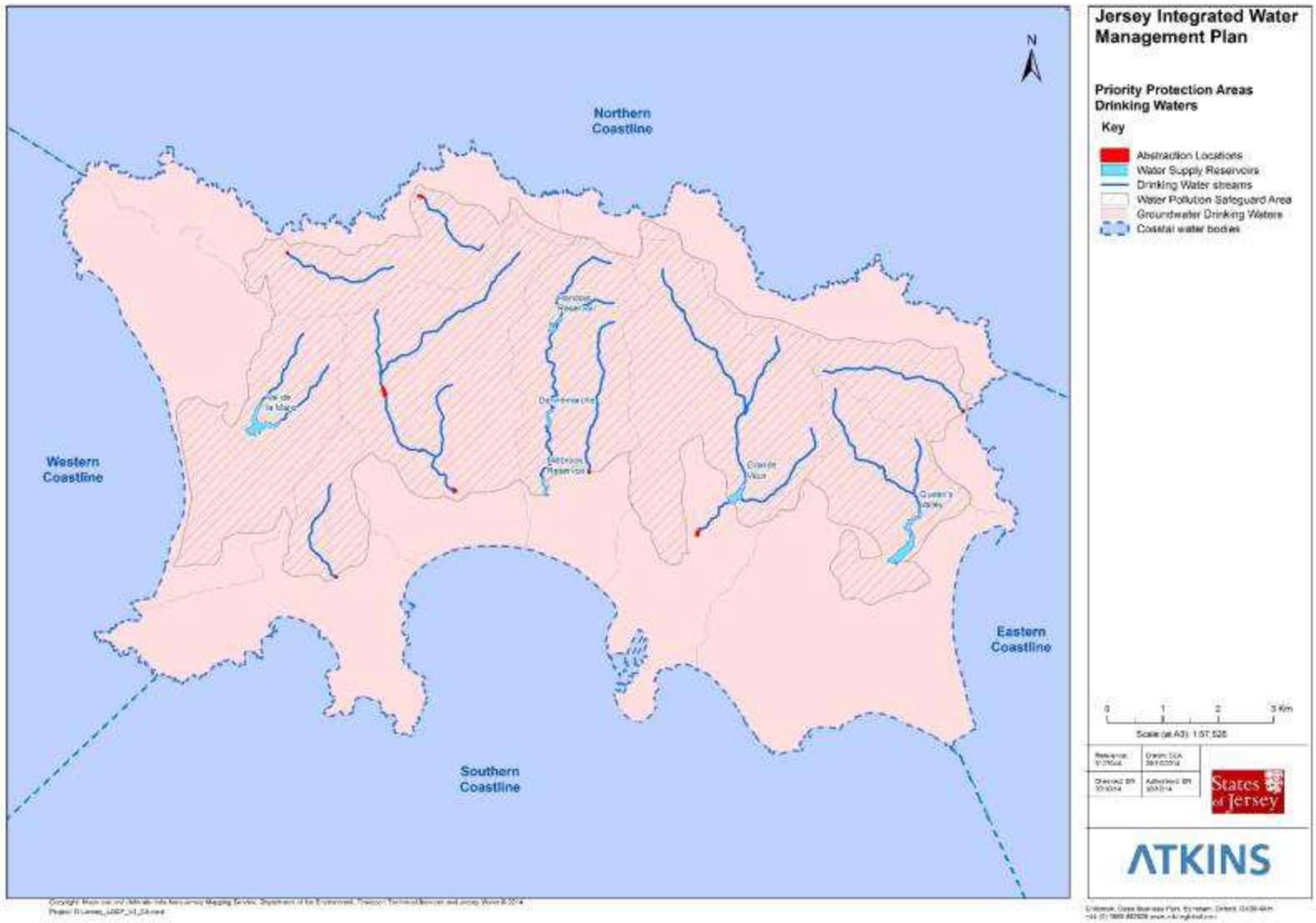


Figure 24: Priority Protection Areas for Drinking Waters

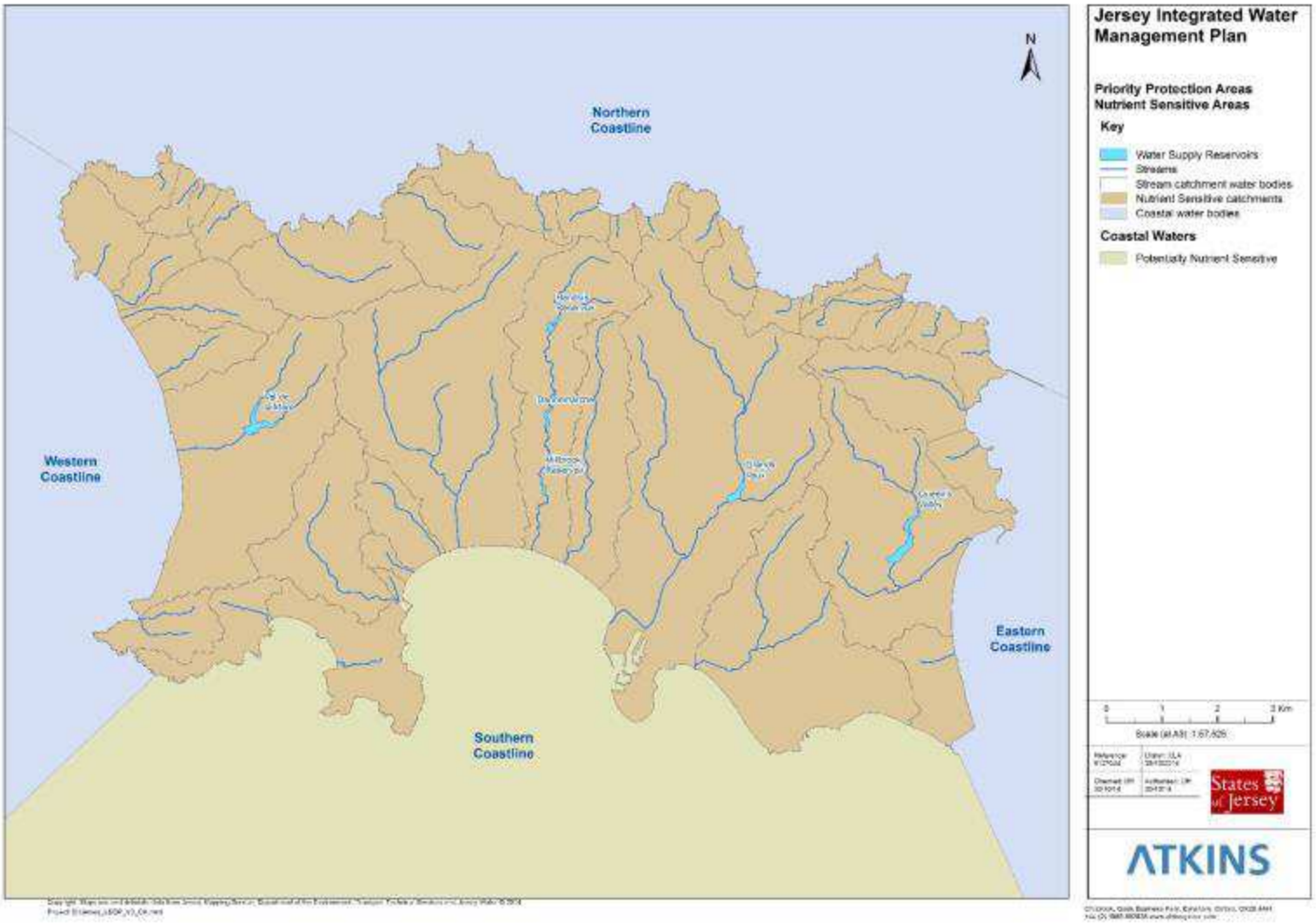


Figure 25: Priority Protection Areas for Nutrient Sensitive Areas

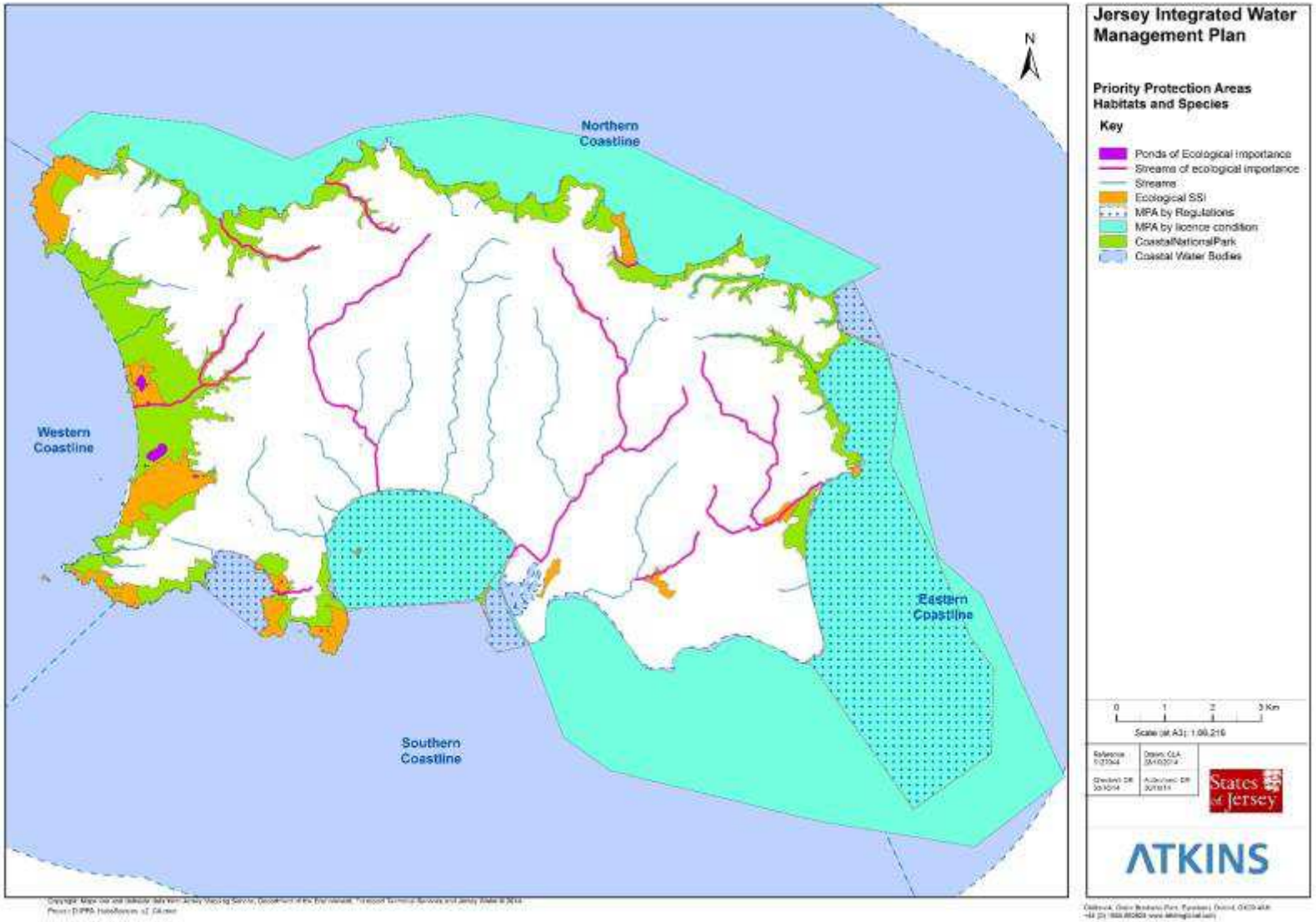


Figure 26: Priority Protection Areas for Habitats and Species

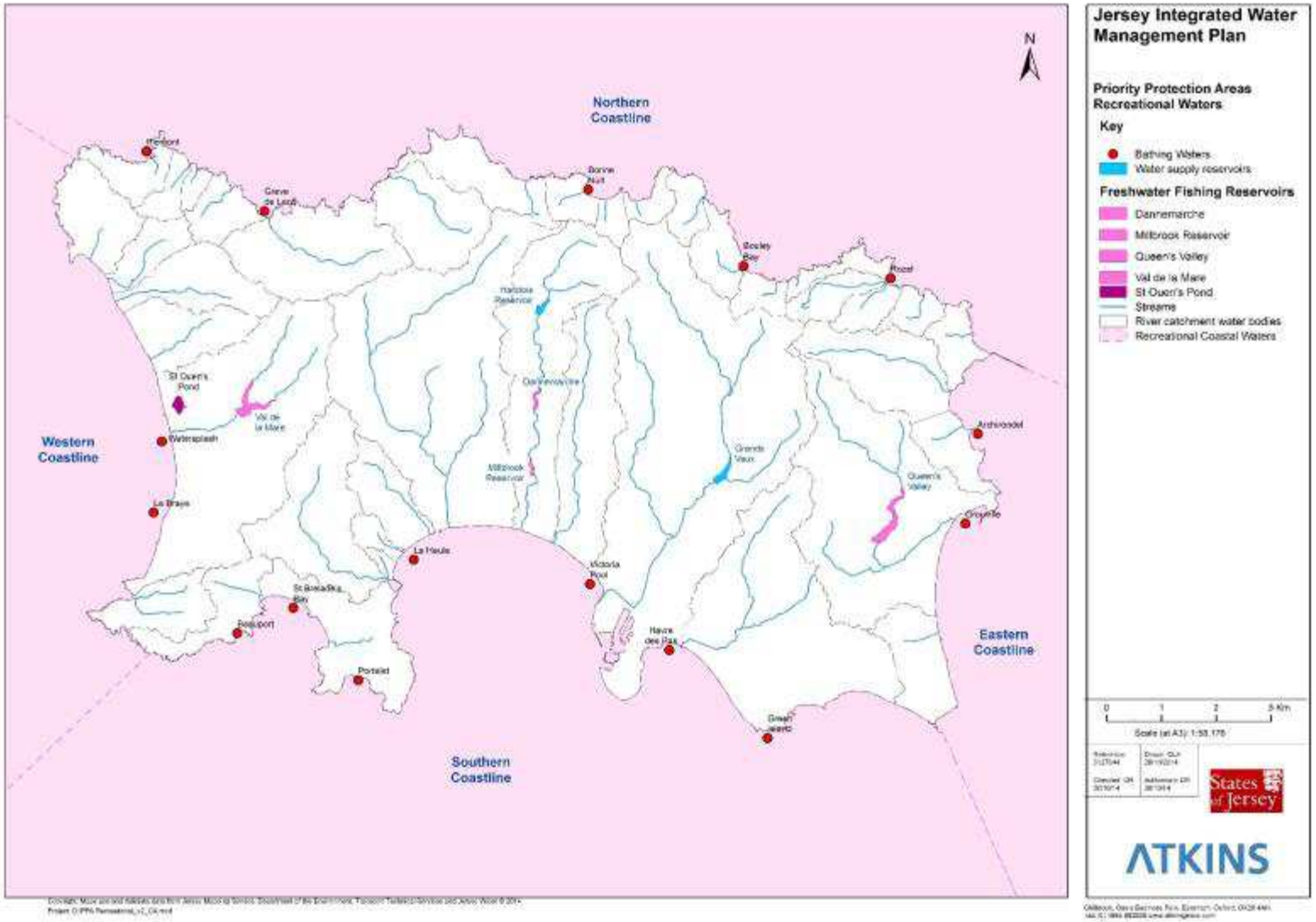


Figure 27: Priority Protection Areas for Recreational Waters

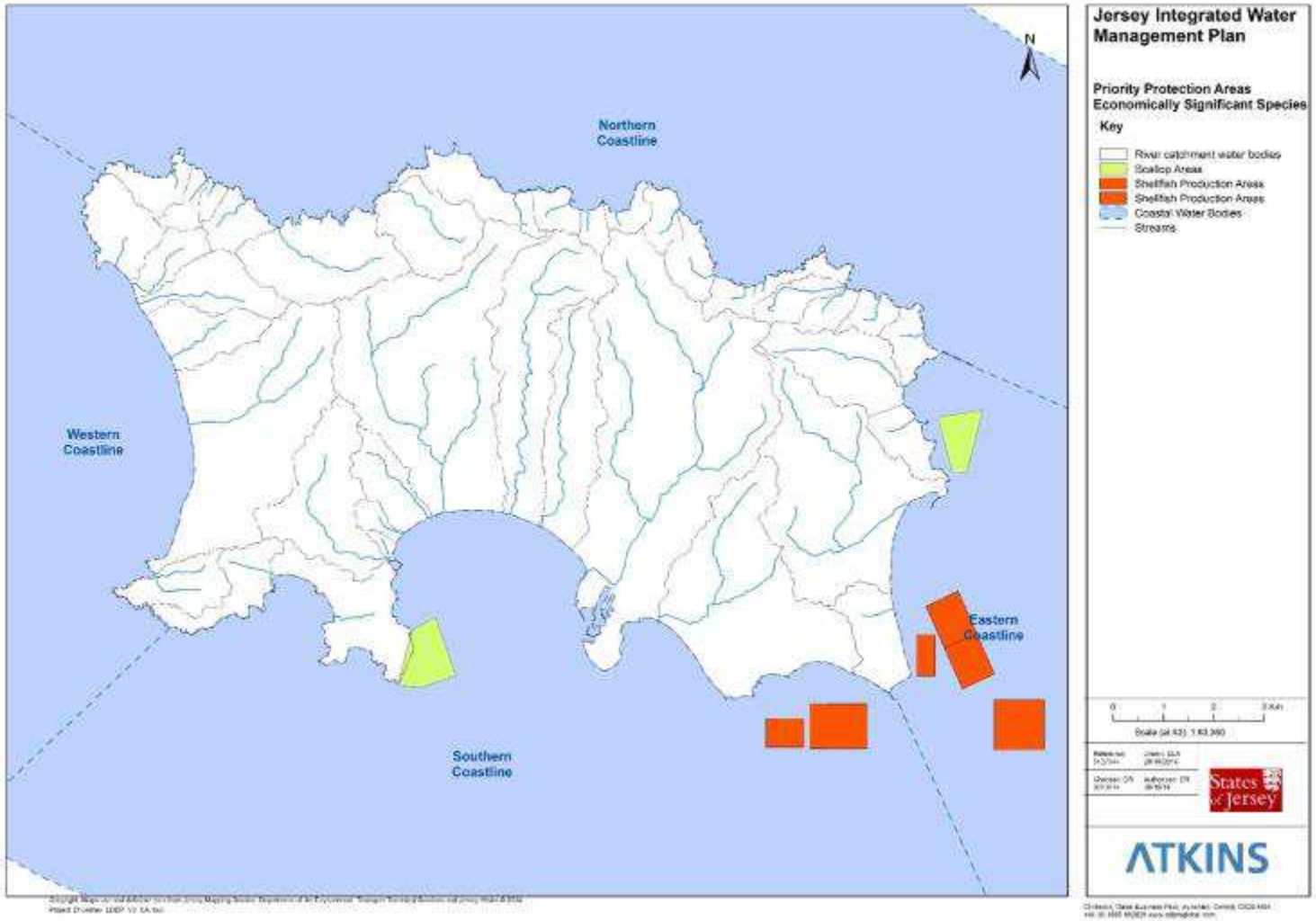


Figure 28: Priority Protection Areas for Economically Significant Species