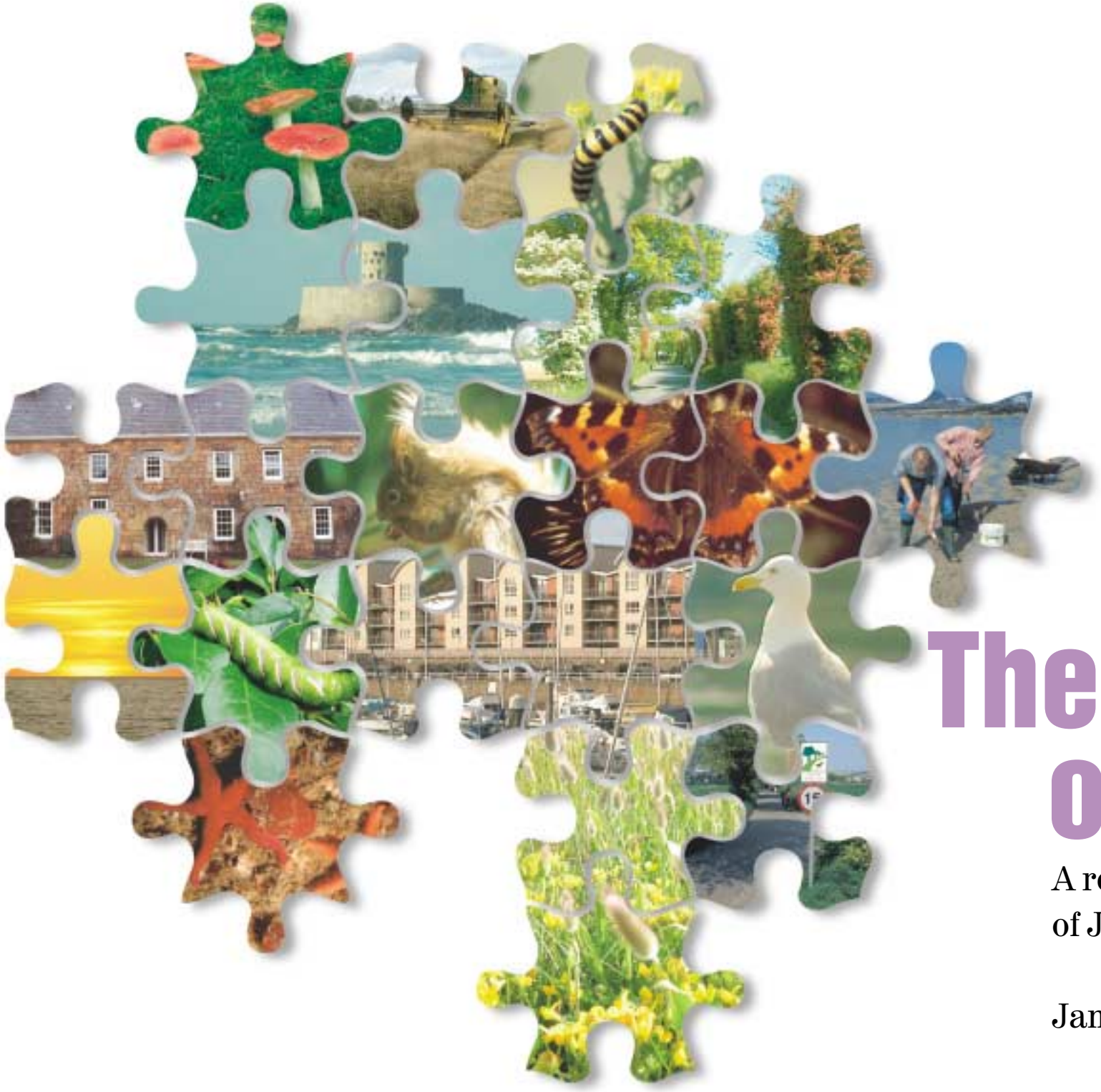
States of Jersey



The State of Jersey

A report on the condition of Jersey's environment

January 2005

Foreword

Our natural environment is more precious - and fleeting - than any of us truly realise. In Jersey, we are particularly well blessed to live on an island of such breathtaking natural beauty - but that splendour brings with it an onerous responsibility.

It is our collective duty to make sure we preserve and enhance our natural environment for future generations.

The quality of our environment is absolutely fundamental to our lives - often in ways that we aren't aware of until it's too late.

We must all play a part in ensuring that together we make decisions that give equal weight to long-term environmental, social and economic issues.

With our small size and our affluent, well-educated population, we have a unique opportunity to show the world that economic and environmental success can work together; if we can't work it out, nobody will.

"The State of Jersey" is truly a landmark document that draws a line in the sand for our shared Island environment.

Senator P. Ozouf
January 2005

'The State of Jersey'
A Report on the Condition of Jersey's Environment January 2005

EXECUTIVE SUMMARY

Introduction

This is a summary of the first ever 'State of the Environment Report' for Jersey. We have outlined our current and future responsibilities towards the Island's environment, categorizing them into twelve 'environmental perspectives'. Using these perspectives, we have identified five 'environmental priorities' and the key actions needed to address them - and examined how we can best monitor our progress in doing so. To successfully assist change and achieve the key actions we have outlined six 'guiding principles' (Figure 1).

One of the key aims of the Strategic Plan for Jersey of 2005-10 is to protect the natural environment. Whilst welcoming economic growth, the strategic plan recognises that *"the pressures placed upon the Island's infrastructure and the effect that these changes have on the environment are acknowledged as consequences of economic growth. These are managed by the introduction of government policies designed to minimise the impact of this growth and help to enhance the existing environment."*

The "State of Jersey" is a foundation for a cohesive environmental strategy for the Island - and a gauge with which to measure environmental policy henceforth.

The statutory responsibility for environmental protection lies with the Government, but to be successful in protecting and improving our natural environment, we all need to live our lives in an environmentally accountable manner.

Environmental perspectives for Jersey

There are many ways to look at and categorise the environment. We have chosen to consider the environment from its broadest (global) to smallest (individual) perspective.

Imagine that you are seeing Jersey from space in its global position; as you approach the earth, you see the Island-wide level, moving ever closer until you eventually land and are able to assess the physical and biological environment at first hand. This is a useful approach that allows us to consider both our overall ecological position in the world and individual factors specific to our Island.

Scale ~ Global

1. Climate change

There is increasing evidence that man-made emissions are accelerating global climate change. Locally, this will affect sea defences, water resource availability, disrupt ecosystems and alter conditions for agriculture and human health.

Scale ~ Island wide

2. Air quality

Although air quality in Jersey is generally good, pollution can arise locally from traffic congestion and from the ageing incinerator at Bellozanne and from further afield via long range transportation processes. Poor air quality can adversely affect ecosystems and human health.

3. Jersey's position in contributing to global biodiversity

Jersey's position makes it an important refuge for many species - particularly those making migratory movements or those with large home ranges such as birds, bats and marine mammals.

4. Land-use patterns

Jersey's landscape is a fine scale mosaic of (sub) urban, agricultural and semi-natural landscapes which contribute to the familiar character of the Island. Changes in land use can impact upon the very soils that we rely on for growing food. They can also result in the loss of semi-natural habitat or alter its character.

5. Contaminated land

The use and development of land can be restricted by contamination which can create direct risks to human health, property and the wider environment.

6. Freshwater quality and availability

The Island is reliant on its surface and ground waters for drinking water, irrigation, industry and recreation as well as for sustaining a vital natural habitat. The appropriate management of this resource is, therefore, vital both for human and ecosystem health.

7. Marine water quality

The local marine habitat is exceptionally rich in species and water quality is generally considered high. However, there is still a threat, particularly from anthropogenic (man-made) sources of pollution. High quality marine waters are vital in underpinning both tourism and the fisheries industry.

8. Waste management

Municipal solid waste production in Jersey has increased by 3% per annum in recent years and the incinerator at Bellozanne needs urgent replacement. Population growth, changes in consumer behaviour and advances in manufacturing technology mean more waste and a more complex waste stream to deal with. This trend is set to continue unless steps are taken to encourage the prevention of unnecessary waste and continue the introduction of more sustainable methods of dealing with unavoidable waste materials.

Scale ~ Habitats

9. The biodiversity of Jersey's natural and semi-natural habitats

Jersey has a myriad of habitat types which support unique, diverse and important ecosystems. However, they must be properly managed and protected from degradation due to the pressures from land use practices, development and pollution, or the introduction of new or alien species.

10. Land management regimes

Jersey's land surface has traditionally been dominated by a farmed rural landscape. However, the agricultural industry is changing in the face of economic pressures and this may cause changes in the character of the Island's countryside. Government support is likely to shift from supporting production to delivering greater environmental benefits.

Scale ~ Species

11. The conservation status of key biological populations

Jersey supports a richness and variety of wildlife that is not matched, area for area, anywhere in Europe. Our natural resources require a high level of protection to ensure their survival given the pressures that arise from human activities.

Scale ~ Individual

12. The quality of life for Islanders

A key factor underpinning the high quality of life in Jersey is a high quality environment. Each of us has the opportunity to help by living in an environmentally responsible way in order to help maintain the Island's environment now and for the future.

Measuring Progress

We will closely monitor each of these 12 perspectives using the *Pressure-State-Response* (P-S-R) model to devise the most appropriate environmental indicators; outlining the *Pressures* facing Jersey's environment, the *State* of the environment and the *Responses* in place to meet these changes.

Our environmental priorities

This model is based on a concept of causality; human activities exert *pressures* on the environment through development, energy generation, transport, industry, agriculture and other activities - which induce changes in the state of the environment and natural resources; air, water, land and nature. Society then *responds* to these changes through environmental, economic and other policies to change behaviour.

By carrying out monitoring within this P-S-R framework, we can assess over time whether our actions are improving Jersey's environment across 40 key indicators.

Jersey has a high quality of life sustained by a good quality environment, but there is no room for complacency. We have identified the five key environmental priorities that arise from this report. In each case, we have summarised the main action points necessary to tackle these environmental priorities.

1. Climate change

Jersey has a high reliance on private cars for local transport, and a dependence on fossil fuels for industrial and domestic uses contributes to local emissions of greenhouse gases.

In order to address this we must:-

i. Reduce our dependence on fossil fuels and introduce energy efficiency measures which will decrease the Island's contribution to climate change and its effects.

ii. Further consider the potential for renewable energy.

iii. Prepare for the local effects of global climate change: different rainfall regimes, rising sea levels, increased stormy weather and the impacts of this on our sea defences and flood prevention systems.

2. High levels of waste production

Excessive waste generation represents a misuse of resources and causes pollution. Jersey's municipal waste has risen by, on average, almost 3% for the last five years and our levels of recycling are not as good as have been shown possible in other European countries. Emissions from our present incinerator fall well short of accepted agreed standards.

In order to address this, the Environment and Public Services Committee has developed a draft Waste Strategy which calls for:-

i. The urgent replacement of the inadequate waste disposal facility at Bellozanne.

ii. Strict adherence to be paid to internationally agreed standards in future waste management planning.

iii. Improvements in recycling rates.

3. Pressure on the quality and quantity of our water resources

The replenishment of local water resources is from rainfall - a finite resource. The quality of these waters is affected by diffuse pollution (such as nitrates from fertilizer applications and soakaways) or point source pollution (such as oil spillages from heating tanks). Around 90% of the Island's population receive their water from the public water supply which is predominately collected from streams.

In order to address this:-

i. Basic controls are necessary to ensure equitable distribution of this scarce resource. The draft Water Resources Law addresses this issue.

ii. We must continue to enforce measures that minimise the occurrence of pollution from point source or diffuse sources.

iii. We must continue to reduce the legacy of pollution. To do so, we need good land management practices to minimise any further contamination.

4. Transport

Jersey has the world's highest car ownership ratio as well as a dependence on air transport for external travel. This results in:

- local congestion and an associated reduction in economic efficiency
- high carbon dioxide emissions which contribute to the greenhouse effect
- localised air pollution that occasionally breaches internationally agreed standards and has risks to health
- the fragmentation of natural habitats by the road networks, airport and harbour development.

In order to address this:

i. The Environment and Public Services Committee is developing a Sustainable Travel and Transport Plan that will be delivered in 2005

Guiding principles

ii. We will tackle congestion and encourage fuel efficient vehicles through fiscal mechanisms.

5. Changes in the countryside and our natural history

The Island is experiencing declines in the populations of common species such as toads, butterflies and farmland birds like goldfinches. To confirm the actual levels and explain the causes of these declines, we need robust, long-term scientific evidence.

Nevertheless, the main causes of change in marine and terrestrial biodiversity are likely to be:

a) Encroaching development; Development of previously undeveloped land causes a gradual sub-urbanisation of the countryside and coastal zone.

In order to address this we must:

i. Adhere to the policies guiding development control as laid out in the Jersey Island Plan 2002.

ii. Encourage landowners to preserve Jersey's natural habitats on their land; for example, wildlife friendly gardening helps prevent the fragmentation of natural habitats.

b) Change through habitat succession; although habitats change naturally, man's influence distorts nature's process and continuity.

In order to address this we must carefully manage naturally occurring habitat succession to maintain biodiversity.

c) Changes in the rural economy; traditional and long-term management of the countryside gave us today's familiar landscape. But economic pressures and changing practices have led to local water pollution and changes to our traditional methods of land management.

In order to address this we must re-engineer the rural economy to create a profitable working countryside with diverse rural activities that sustains our rural landscape and the habitats it supports.

Our aim is to be a catalyst for change where this is most needed to address negative environmental trends and to help prepare the Island for a sustainable future. We have picked out six guiding principles that will help engender positive change:

1. Back ideals with actions

Provide firm, fair, transparent and effective statutory regulation, taking a precautionary approach. Use fiscal mechanisms to change behaviour if necessary.

2. Evaluate our progress

Carry out, and report on, effective environmental monitoring to chart our progress, identify priorities for action and carry out effective management planning to make wise and measured use of public money.

3. Work in partnership

Consult, communicate and establish open relationships between organisations, stakeholders and partners to make decisions, target funds and share expertise. This will enable Jersey as a whole to gain maximum social, economic and environmental benefits.

4. Educate and empower

The state of our environment is a collective responsibility. To help improve understanding of environmental issues and to foster better environmental practices in all walks of life, we will make environmental information easily accessible for individuals to assess the issues, participate in debate and make better informed personal choices and actions.

5. Use finite resources efficiently

We must manage the critical and limited resources of water, soil and land wisely to underpin economic success and health.

6. Act now - plan for the future

Consider the future consequences of our current polices and actions. We must plan to ensure that we pass on our environment to future generations in as good as, or better condition than it is now.

Further Information

To receive a copy of the full report -

" 'The State of Jersey', a report on the condition of Jersey's environment, January 2005" - or to request other information on any aspect of this executive summary, please contact

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JE3 5JP
Jersey C.I.

Tel (01534) 866200

Or visit www.environment.gov.je

Figure 1 The approach taken in the development of the 'States of Jersey' report

1. The 12 environmental perspectives

Jersey's environmental themes were categorised from the global to individual scale and 12 environmental perspectives were identified. These subjects are critical themes that must be addressed if we are to maintain local environmental quality. They are:

1. **Climate change**
2. **Air quality**
3. **Jersey's position in contributing to global biodiversity**
4. **Land use**
5. **Contaminated land**
6. **Freshwater quality and availability**
7. **Marine water quality**
8. **Waste management**
9. **The biodiversity of Jersey's natural and semi-natural habitats to global biodiversity**
10. **Land management regimes**
11. **The conservation status of key biological populations**
12. **The quality of life for Islanders**

2. Measuring our progress

The Pressure-State-Response model was applied to help identify key environmental priorities and define critical issues and the best indicators with which to monitor and report on them.

Five key environmental priorities were identified:

1. **Climate change**
2. **High levels of waste production**
3. **Pressure on the quality and quantity of our water resources**
4. **Transport**
5. **Changes in the countryside and our natural history**

3. Guiding principles

To assist in addressing the environmental priorities we will use 6 Guiding principles:

1. **Back ideals with action**
2. **Evaluate our progress**
3. **Work in partnership**
4. **Educate and empower**
5. **Use finite resources efficiently**
6. **Act now, plan for the future**

Contents

1.0 What is the 'State of Jersey'?

1.0 What is the 'State of Jersey' ?

1.1 Introduction

'State of the Environment' reporting brings together environmental information and provides a baseline from which we are able to measure changes and chart our progress. Everyone recalls how when they were children the summers were longer, the birds sung louder and it snowed properly in the winter! However, without long-term measured data how do we quantify and evaluate changes and, more importantly, how do we find solutions when we see things are going wrong ? This report is an attempt to identify the state of Jersey in 2005. It draws together what we know about the condition of the environment to date and puts much of it into historical perspective.

The quality of our environment is fundamental to the quality of our lives yet many pressures are placed upon it which bring about often negative changes in its condition or state. It is generally accepted that we face many challenges ahead if we are to achieve the overall aim of maintaining and improving the quality of our environment but how are we to know if we are successful in this aim if we do not have a baseline to measure from?

This is just the first step though - successful state of the environment reporting requires a continual review and update of environmental trends so we can prioritise our actions in order to truly maintain and improve the quality of our environment. Over the next five years the Environment Department will be reporting on changes in 40 key indicators so that in 2010 we will be able to report back in a more streamlined way when it will be clear if we are meeting the challenges the Island must face.

The quality of life that we enjoy in our Island is underpinned by the natural environment around us. Whether we take an active interest in wildlife or more simply enjoy walking on the beach or just carrying out our favourite sports in pleasant surroundings, our environment provides the foundation and context for our everyday activities. More than this though, clean air and water and the ambience of the places we call home are fundamental to our personal health and wellbeing.

To put it in the wider perspective, Jersey exists for more than just itself. For example, the Island offers a refuge for migrating birds and animals and clearly our fish stocks rely on more than just local water quality. Importantly we are not isolated from changes in the global climate nor the world economy. For these reasons Jersey strives to recognise and comply with international standards often through becoming signatories to International or 'Multi-lateral Environmental Agreements' (MEAs).

1.2 A mission statement for Jersey's environment

The value of the environment has been confirmed by the States Strategic Plan 2005-2010 when it was stated as an overall aspiration to ensure that Jersey:

> **'Is an Island where people enjoy a good quality of life because of a high-value, prosperous economy which supports a pleasant environment and an inclusive society.'**

The Strategic Plan 2005-2010 is the blueprint for the States to achieve the goal of a secure future for Jersey in an increasingly global community. It describes a vision for Jersey's future and to achieve that vision, nine key Strategic Aims have been identified as priorities that government must deliver to secure a prosperous, sustainable future whilst retaining the Island's environmental and cultural heritage :-

Strategic Aims :-

- **Aim One -** To create a strong and competitive economy
- **Aim Two -** To maintain a sustainable population
- **Aim Three -** To enhance quality of life
- **Aim Four -** To protect the natural and built environment
- **Aim Five -** To invest in Jersey's youth
- **Aim Six -** To promote pride in Jersey
- **Aim Seven -** To develop Jersey's international personality
- **Aim Eight -** To reconnect the public and the States
- **Aim Nine -** To balance the States' income and expenditure and improve the delivery of public services

For each of these aims, a number of objectives and actions have also been identified which are considered key to achieving the aims. These are set out in the Strategic Plan, along with their criteria for success.

The Strategic Plan poses the question 'What will Jersey look like in 2010 if the objectives of the plan are achieved?' Whilst 'welcoming economic growth' it is recognised that:

> **'The pressures placed upon the Island's infrastructure and the effect that these changes have on the environment are acknowledged as consequences of economic growth. These are managed by the introduction of government policies designed to minimise the impact of this growth and help to enhance the existing environment. The emphasis is placed firmly on retaining quality of life for the resident population and revitalising the vibrancy of the Island's unique culture and character.'**

The report suggests that this will be achieved by among other things:-

- The planning regime will encourage re-investment of development proceeds to maintain the character of Jersey countryside and attractions;
- A complete review of the current transport links and investigation of alternative possibilities, which will be critical for economic expansion and to maintain the quality of life for local residents;
- An increase in the housing stock of no more than 1,750 units. This is achievable through a review of current planning procedures and the Island Plan to investigate more efficient use of urban areas and to encourage regeneration of land;
- Investment in, and integration of, policies to improve the management of existing infrastructure to minimise the environmental impact of any increase in population and to relieve the pressure it places on the Island's biodiversity and countryside.

This most recent commitment has built on the mission statement made by the States of Jersey in 1996:-

> **"The States will promote the conservation and sustainable use of natural resources and will minimise environmental pollution in all of its own activities. It will seek, through its influence, the achievement of the same objectives by other sectors of the community. The States will review all of its policies, programmes and services and undertakes to act wherever necessary to meet globally accepted standards."**

In 1995, underpinned by the drive for sustainability, the States of Jersey adopted the following objectives:-

- **To ensure that the development and management of natural resources does not limit choices in the future;**
- **To integrate pollution control and waste minimisation to prevent environmental deterioration;**
- **To enhance the quality of the shoreline, the rural and the urban environment;**
- **To reduce consumption of non-renewable energy;**
- **To preserve open land while recognising and responding to the need to provide for the Island's economic and social policy objectives;**
- **To discourage development in the rural environment;**
- **To reduce the detrimental impact of traffic on people's lives;**
- **To avoid over-exploitation of the Island's mineral and water resources;**
- **To conserve and protect the marine environment;**

- **To limit the use of resources through mechanisms which do not impose increased costs for those with relatively low incomes;**
- **To protect the best of the Island's architectural and archaeological heritage;**
- **To protect the Island natural ecosystems and conserve their associated flora and fauna;**
- **To adopt an agricultural policy that does not impact adversely on the environment;**
- **To limit the impact of noise and other nuisances;**
- **To ensure compliance with international commitments;**
- **To raise levels of environmental awareness and responsibility.**

1.3 Whose responsibility is it to achieve this environmental vision?

The objectives and mission statement adopted by the States since 1995 provide an 'Environmental Vision' for Jersey that is relevant now and in the future. Clearly the States of Jersey have a statutory responsibility to develop policy and strategy in order to achieve this vision. It serves to regulate, manage and monitor its own departments, industry and others in their activities and services.

Although government holds the statutory responsibility, its decisions and actions are supported and enhanced by invaluable collaboration with non-governmental organisations, stakeholders and individuals.

Finally, and perhaps most importantly, each and every one of us has the responsibility to make informed decisions on how to live our lives in the most environmentally accountable manner.

Effective communication is essential if the important role that everyone plays in achieving this Environmental Vision is to be fulfilled.

1.4 Twelve environmental perspectives for Jersey

There are many ways to look at and categorise the environment. Imagine you are looking through a series of windows that first show Jersey in it's global position, another smaller window shows the Island wide level whilst more smaller windows take us through to the level of the individual inhabitant of the Island. This 'global to personal' approach has identified twelve environmental perspectives for Jersey.

Scale ~ Global

Atmospheric quality

1. Climate change

There is increasing evidence that man-made emissions are accelerating global climate change. Locally, this will affect sea defences, water resource availability, disrupt ecosystems and alter conditions for agriculture and human health.

2. Air quality

Although air quality in Jersey is generally good, pollution can arise locally from traffic congestion and from

Scale ~ Island wide

the ageing incinerator at Bellozanne and from further afield via long range transportation processes. Poor air quality can adversely affect ecosystems and human health.

Biodiversity

3. Jersey's position in contributing to global biodiversity.

Jersey's position makes it an important refuge for many species - particularly those making migratory movements or those with large home ranges such as birds, bats and marine mammals.

Land

4. Land use

Jersey's landscape is a fine scale mosaic of (sub) urban, agricultural and semi-natural landscapes which contribute to the familiar character of the Island. Changes in land use can impact upon the very soils that we rely on for growing food. They can also result in the loss of semi-natural habitat or alter its character.

5. Contaminated land

The use and development of land can be restricted by contamination which can create direct risks to human health, property and the wider environment.

Water

6. Freshwater quality and availability

The Island is reliant on its surface and ground waters for drinking water, irrigation, industry and recreation as well as for sustaining a vital natural habitat. The appropriate management of this resource is, therefore, vital both for human and ecosystem health.

7. Marine water quality

The local marine habitat is exceptionally rich in species and water quality is generally considered high. However, there is still a threat, particularly from anthropogenic (man-made) sources of pollution. High quality marine waters are vital in underpinning both tourism and the fisheries industry.

Waste

8. Waste management

Municipal solid waste production in Jersey has increased by 3% per annum in recent years and the incinerator at Bellozanne needs urgent replacement. Population growth, changes in consumer behaviour and

advances in manufacturing technology mean more waste and a more complex waste stream to deal with. This trend is set to continue unless steps are taken to encourage the prevention of unnecessary waste and continue the introduction of more sustainable methods of dealing with unavoidable waste materials.

Scale ~ Habitats

Changes in biodiversity

9. The biodiversity of Jersey's natural and semi-natural habitats.

Jersey has a myriad of habitat types which support unique, diverse and important ecosystems. However, they must be properly managed and protected from degradation due to the pressures from land use practices, development and pollution, or the introduction of new or alien species.

Land management

10. Land management regimes

Jersey's land surface has traditionally been dominated by a farmed rural landscape. However, the agricultural industry is changing in the face of economic pressures and this may cause changes in the character of the Island's countryside. Government support is likely to shift from supporting production to delivering greater environmental benefits.

Scale ~ Species

Conserving changing populations

11. The conservation status of key biological populations.

Jersey supports a richness and variety of wildlife that is not matched, area for area, anywhere in Europe. Our natural resources require a high level of protection to ensure their survival given the pressures that arise from human activities.

Scale ~ Individual

We are what we do

12. The quality of life for Islanders

A key factor underpinning the high quality of life in Jersey is a high quality environment. Each of us has the opportunity to help by living in an environmentally responsible way in order to help maintain the Island's environment now and for the future.

1.5 Monitoring the state of the environment and the Pressure-State-Response framework

Defining the twelve environmental perspectives is just the first step; how are we to know if we are successfully addressing all the angles of these critical themes? Monitoring is about identifying changing trends and signals that action is needed. It is essential if we are to have an informed basis for assessing the priorities of our actions, charting our progress and planning for the future.

Of course, monitoring is not new. Many Governmental departments and non-governmental organisations have been monitoring environmental parameters to different degrees and for different periods, some for over 100 years. However, what we are providing here is a collated report on many different environmental issues with examples of some of the monitoring that has been carried out to date.

Much of the existing monitoring has been carried out to achieve many different and disparate objectives and has often been successful in this aim. In order to monitor environmental conditions and changes in these conditions efficiently and economically, single issues or events are often used as indicators.

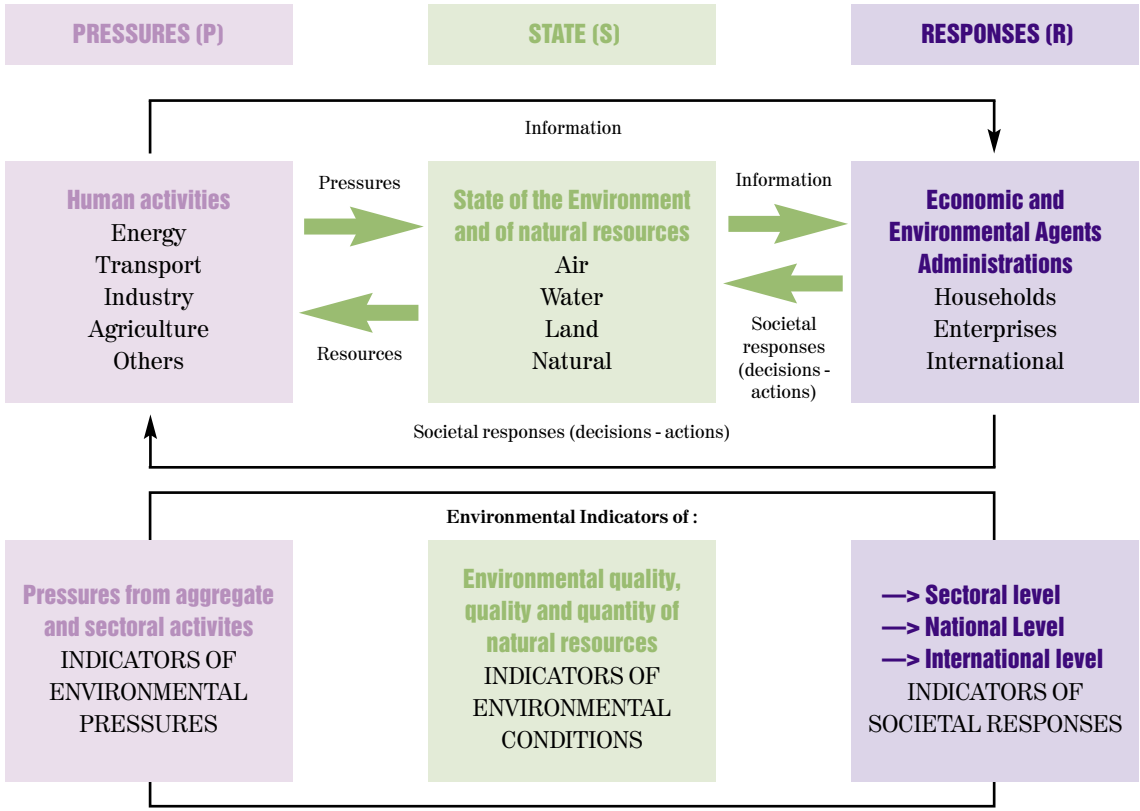


Figure 2 The P-S-R framework as defined by the Organisation for Economic
Co-operation and Development 1993
Source: 'OECD Core set of indicators for Environmental Performance Reviews'. OECD 1993

1.6 About this report

However, environmental processes are often complex and inter-related so identifying the appropriate indicators can be difficult. One approach is the Pressure-State-Response model (P-S-R; Figure 2). This framework is based on a concept of causality: human activities exert ***pressures*** on the environment which can induce changes in its ***state***. Society then ***responds*** to these changes through environmental, general economic and sectorial policies. By carrying out monitoring within this P-S-R framework we can, over time, assess whether our actions are having the desired effect.

In the production of Jersey's first 'State of the Environment Report' we contribute to Strategic Aim Six, as set out in the Strategic Plan 2005-2010, 'To Promote Pride in Jersey'. The States pledge to promote involvement and a 'better understanding of the issues facing the Island today to encourage debate and aid informed choices' and 'ensure that information is communicated in ways which reach all members of the community'. This report uses the environmental perspectives posed in section 1.4 as the basis for identifying the pressures affecting our environment which are detailed in section 3. We then present information about the state of our environment in section 4. Clearly this report is not a complete inventory of everything we know about the local environment, instead we use example data sets to illustrate particular points and often refer to more detailed documents that may expand on particular points.

Moving on from the condition of the environment, we examine the responses the States of Jersey are making to the pressures and consequent changes in state. As so many aspects of the environment are inter-related, some of the responses we propose in section 5 address more than one of the twelve environmental perspectives. Using a P-S-R analysis of Jersey's environmental perspectives we have identified the most appropriate indicators to monitor in order to report back on our progress in meeting the challenges ahead. Often the data is already being collected in one form or another and we can simply report back on it in a co-ordinated manner. Alternatively some indicators have required new or updated projects to collect the required information.

In creating projects to collect indicator data, we have looked to use community resources as much as possible. For example, an invertebrate monitoring programme steered by the Environment Department that uses butterflies as biodiversity indicators was begun in 2004. With the necessary training, 18 dedicated volunteers were able to collect information on 28 sites Island wide and provide a level of coverage impossible to achieve through Governmental resources alone. Alternatively, the highly specialised process of monitoring air quality is steered by the Health Protection Unit (Department of Health and Social Services) and carried out in consultation with specialists in the field.

After carrying out the P-S-R analysis of the environmental perspectives and identifying appropriate indicators to measure our progress, five environmental priorities have been defined. These are the critical issues which must be addressed and in section 6.2 we outline the key actions associated with the environmental priorities.

In section 6.3 we outline the six guiding principles that will assist us when we address the environmental priorities.

2.0 Background

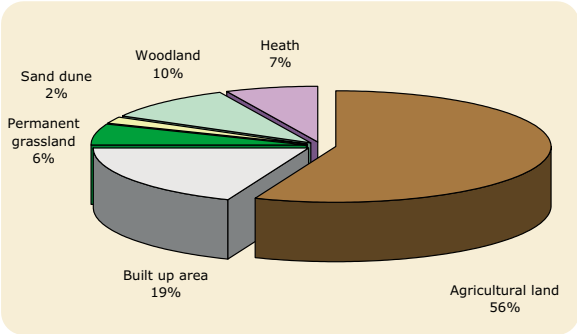


Figure 3 Jersey's land cover as estimated from Landsat satellite mapping data. Note how agricultural land and the built-up area comprises 75% of the Island's area leaving only one quarter for semi-natural habitats. Even part of the habitat defined as 'permanent grassland' is land under pasture used by the dairy industry.
Source: 'Aggregation of Jersey Land Cover Map Data' Smith, 1998.

2.0 Background

Jersey is positioned where two temperature regimes merge and this distinctive climate contributes much to its special character both in terms of the types of plants that can thrive as well as creating the familiar characteristics of the landscape such as the exposed, windswept character of the north and west. The Island clearly is influenced by the ocean being warmed by the Gulf Stream. However, its sheltered location in the Bay of St. Malo means there is also a continental influence. The combination of these two forces and how they come together within an insular environment creates Jersey's climate and distinguishes it from other Channel Islands and the mainland of France and the UK. Prevailing winds are from the west to north-west during the Summer, southwest or westerly during the Winter and Autumn and northeasterly during Spring. These salt laden winds are responsible for the open exposed character of St. Ouen's Bay and the harsh north coast, characterised by species tolerant of the salt spray and exposure. Jersey's geographical position and favourable climate allow many species normally restricted to either Britain or the European continent to extend their range, resulting in a mixture of animals and plants found only in the Channel Islands.

Although small, only 117 square kilometres in size, Jersey has a variety of different semi-natural terrestrial habitats ranging from marsh to wood, cliffs to sand dune (Figure 3). Thanks to the Island's position and geomorphology it hosts a mosaic of semi-natural habitats and, along with our isolation from Continental Europe, this has led to a unique flora and fauna with some unusual species groups augmented by accidental introductions. For example, of the 2 500 species of wild plant on Jersey, 100 are probably accidental introductions.

A 12 metre tidal range means the marine environment is no less complex and a study carried out in 1995 (Kindleysides 1995) identified 38 intertidal biotopes locally compared to 87 in the entire UK. The fishing industry plays a significant role in Island life and the maintenance of the marine habitat is important to safeguard nursery grounds and feeding areas for commercial species. Jersey's location at the confluence of the cold and warm temperature marine biogeographical region together with the warming influence of the Gulf Stream results in important groups of animal and plants associated with the warmer waters of southern Europe as well as species associated with the cold, northern waters of the UK.

Man's association with Jersey's landscape has been long-standing with evidence of people visiting the area that is now our Island for some 250 000 years but it was approximately 5000 years ago that man began to heavily impact the Island with his farming activities and forest clearances. The subsequent grazing of sheep, growing of orchards, more recent farming activities and building developments have meant that the Island we see now is a result of the interaction between human and natural influences over thousands of years. Currently, about 80% of the Island is classified as 'rural' with about 56% of this being used for agriculture, so that locally this industry has an impact out of proportion to its contribution to the Island's economy.

Furthermore, the future of Jersey's landscapes and biodiversity is critically linked to that of the agricultural industry.

This biodiversity is the essential element of our treasured coastal and countryside landscapes that have long been regarded as one of the Island's most important assets underpinning strong economic, leisure and tourism interest. Intertwined with our rural heritage and natural beauty is Jersey's status as a holiday destination. Although in recent times Jersey's popularity as a destination has reduced, some of the Island's most successful recent tourism events have revolved around outdoor pursuits such as walking festivals, encouraging visitors to enjoy the Island's natural heritage. Even the current promotion of Jersey for active sports is supported by a high quality environment.

In 2003, Jersey was home to 87 500 people - this classifies the whole Island as suburban. The ever-growing built environment and economic drive for intensification in farming methods has put immense pressures on our natural heritage. Furthermore, the resources we require must often be sourced locally and the need for drinking water, stone for building and areas to dispose of our waste have eroded the extent of the semi-natural habitat and changed the nature of our countryside.

Although the Island's status as a Crown Dependency gives it autonomy over domestic affairs, it has a responsibility beyond its shores and the inter-dependence of ecosystems knows no political boundaries. Migratory species such as birds and marine mammals visit the Island. Migratory birds depend on habitats in Jersey for 'refuelling' along their migratory route. The Island's contribution to the welfare of migratory species may be critical. Their welcome and valued presence here is dependent on the continued existence of suitable ecosystems on their migratory paths, thus demonstrating our shared responsibility on a global scale.

3.0 Pressures on the environment

3.1 Natural forces

Figure 4 Maison St. Louis 10 year rolling annual mean temperature anomaly from the 1971 to 2000 (30 yr) period average
Source: Jersey Weather and Climatological Report 2000 - Jersey', Meteorological Department .

3.0 Pressures on the environment

The pressures on Jersey's environment can be divided into six main categories; natural forces, societal influences, releases and discharges, abstractions and removals, waste and illegal practices and incidents :-

3.1.1 Climate and climate change

Jersey has an equitable climate with mean daily air temperatures of 12°C; this provides theoretical year round growing conditions although there are sometimes interruptions by occasional ground frosts between November and March. This mild temperature regime is enhanced by the Island's topography sloping downwards from north to south and, since Jersey receives more annual sunshine, on average, than the southern coast of the UK, crops ripen early by comparison with those in England.

Despite these somewhat idyllic weather conditions, anthropogenic factors such as the emissions of greenhouse gases and their consequent rise in concentration in the atmosphere are known to cause changes in our climate that is occurring at a rate not seen in at least the past 1,000 years. The 'greenhouse effect' is one originating naturally - the earth's temperature is maintained as a balance between energy arriving in from the sun and energy being emitted from the earth to space. Not all of the outgoing radiation is lost; some is absorbed by naturally occurring 'greenhouse gases' *e.g.* water vapour. Without this natural warming, the earth's temperature would be approximately 33°C lower than at present. However, since the beginning of the Industrial Revolution, concentrations of the persistent 'greenhouse gases' in the atmosphere - carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O), have risen as a result of human activities. At the same time, changes in global climate have occurred and work by an international body of scientists to establish causal links has detected a strong human signal.

In 2001, the Intergovernmental Panel on Climate Change, reported that 'there is new and stronger evidence that most of the warming over the last 50 years is attributable to human activities'. Long-term monitoring carried out by the Jersey Met Office has observed an increase in mean annual temperature rises since recording began locally in 1894 (Figure 4).

In recognition of this alarming trend the Convention on Climate Change, which was agreed at the Earth Summit in 1992, proposed the reduction in emissions of greenhouse gases to 1990 levels by 2000. Jersey is a signatory to this. In December 1997, the Parties to the Framework Convention on Climate Change adopted the

Parameter	Summer	Winter
Average Temperate	▲ 3.8°C	▲ 2.4°C
Frequency of hot summer days	▲ x4-5 fold	
Frosts	▼ 70%-80%	
Snowfalls	▼ 100%	
Wind speeds	▲ 8-10%	
Precipitation	▼ 45%	▲ 24%
Heavy precipitation	▼ 40-50%	▲ 30-50%
Net sea-level	▲ 74cm	
Height in 50 year storm surge	▲ 50cm	

Figure 5 Predicted change in Jersey's climate under a medium-high scenario for future emissions.
Source: UK Met Office, 2003.

Kyoto Protocol. Under this protocol, the UK has agreed to reduce emissions of a 'basket of six greenhouse gases - CO_2, CH_4, N_2O, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6) by 12.5% below the 1990s level by the period 2008-2012.

Future emissions of greenhouse gases will depend on socio-economic issues such as population growth, energy use, economic growth and the introduction of new technologies. Although CO_2 is less potent than the other 'greenhouse gases' on a ton by ton basis, the quantity of emissions is so large that it remains the main contributor to global warming. Carbon dioxide is mainly generated from the combustion of fossil fuels such as oil, gas and petroleum products. CO_2 emissions are increasing in most EU countries and have gone up in most recent years in the UK, but are still well below 1990 levels.

In Jersey in 2000, 93% of our greenhouse gas emissions originated from CO_2 (Coley and Romeril 2000) and CO_2 generation actually increased overall between 1990 and 2000. Locally, carbon dioxide arises from the combustion of fossil fuels particularly as a result of our previous dependence on oil-fired electricity generation, high levels of private car usage and the incineration of municipal rubbish. However, although more recent data is not yet available, a decline in CO_2 emissions is expected due to the closure of the La Collette oil-fired power station in 2000. This has resulted in nearly 30.000 tonnes less oil being burnt for electricity generation in 2003 than in 2000 (see Section 3.2.3). Nevertheless, the level of car ownership in 2001 locally was higher than anywhere else in the world and in one year a car can produce four times its own weight in carbon dioxide.

A recent study carried out by the UK Meteorological Office used high resolution climate models to predict how climate change could affect Jersey. These models attempt to address all the many relevant factors and are the most credible and self-consistent data available (Figure 5).

Predicted increases in sea levels and increases in the height of the 50-year storm surge are particularly relevant to Jersey with its 90 km coastline. Damage to coastlines and inundation is caused mainly by short-lived, extreme, high-water levels in storm surges due to the effects of wind and low pressure particularly around the time of high tide when they can be most damaging. We only need to look at the south coast of the Island, where many properties, built on or close to natural or man-made sea defences, are at risk.

Overall, even though we are uncertain exactly how climate change will affect the Island, it is clear that even with conservative estimates of change the Island must be forward thinking in order to adapt to different climate regimes and their consequences. Under the scenarios shown, we can expect significant implications for the Island's biodiversity in the medium term (*i.e.* by 2050). As we have seen, Jersey's unique flora and fauna is a result of the Island's situation on the interface between the warm temperate and cold temperate biogeographical regions. Thus conditions for species associated with Mediterranean climates could improve, whilst species associated with temperate climates may decrease. The potential for the Island to be colonised / re-colonised by new species will be limited because of Jersey's insular nature and also restricted by

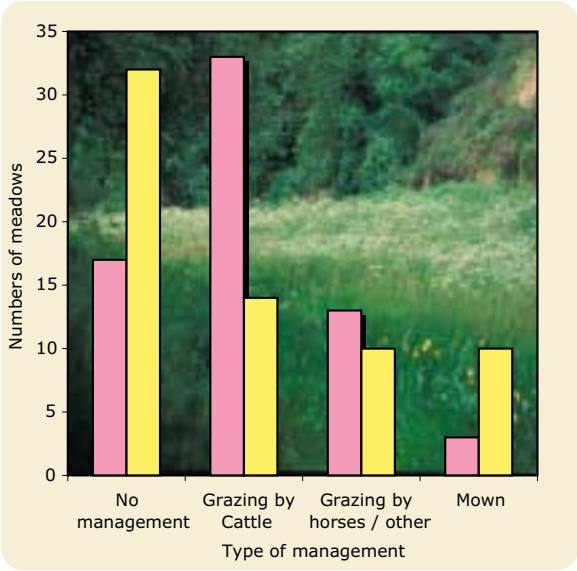


Figure 6 The type of management recorded in 65 wet meadow sites Islandwide in 1983 (pink bars) and 2003 (yellow bars). Note how in 1983 far more meadows were managed, particularly by cattle grazing. **Source :** 'Jersey Wet Meadow Survey 2003', Penny Anderson Consultants.

fragmentation of semi-natural habitats locally. Furthermore, the predicted rate of climate change exceeds the rate at which ecosystems are capable of change. These predictions underline the importance of allowing wildlife as much flexibility as possible by preserving and enhancing the Island's biodiversity and by reversing habitat fragmentation.

3.1.2 Biological factors

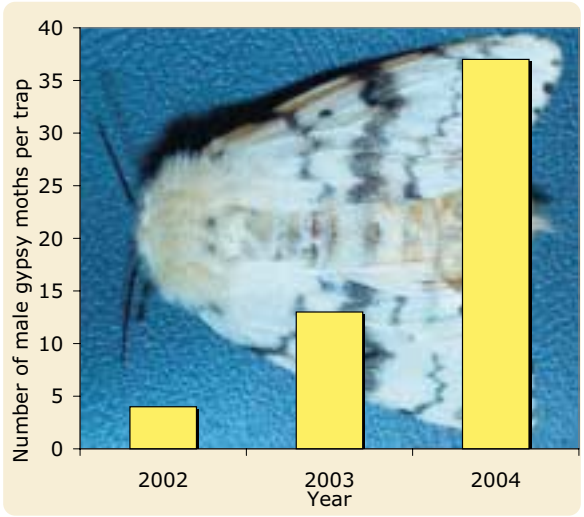
Habitat change

The face of Jersey is a product of its isolation and climate as well as its land management practices over many centuries. Much of what we see and value is a snapshot in ecological time and left unmanaged would revert to another habitat type. Our heathlands for example are man made artefacts of past land use, and are extensive due to their importance in a subsistence farming regime. The natural vegetation was altered thousands of years ago, and the heathland which developed has played a major part in the Island's economy, providing a rich source of fuel, bedding and pasture. Hundreds of plants and animals depend on these conditions, yet this traditional management no longer takes place as our standard of living has risen. Without management, grasslands become rank and woody plants start to grow on them, areas of scrub revert to woodland, soil conditions change, and if we wish to maintain the diversity of species that depend on these habitats, we need to maintain the anthropogenic conditions that we created thousands of years ago. Other habitats will undergo similar changes - wet meadows, for example, are species-rich habitats preserving a seed bank and habitat for varied invertebrates and those further up the food chain. However, changes in the practices of the dairy industry make it difficult for these fields to be effectively grazed - yet without grazing or cutting they will eventually scrub over and revert to woodland, substantially altering the valuable biodiversity they presently support (Figure 6).

Alien species

Species colonisation or extinction is a natural phenomenon but generally these processes occur over long periods. In addition, plants and animals have been moved around either deliberately or accidentally by human activity; many of our most familiar plants, though they did not originate here, are now totally naturalised. Fossils and peat beds can indicate the historical development and change of the flora and fauna since the retreat of the ice of the last glaciation about 15-20 000 years ago. Debates about which plants are native or non-native are ultimately sterile, but certain guidelines can be used to help make management decisions. Some species are more easily identified as non-native than others. Birds, amphibians, mammals and reptiles are represented in Jersey by relatively few, well documented species. It is therefore much simpler to determine what is native in these groups. For example, the red squirrel and the hedgehog were both reintroduced in the late 19th Century, they were most likely present here before the Island was isolated from the Continent, and again they are now considered part of our native fauna.

Figure 7 An increase in the average number of male gypsy moths caught per trap from 2002 to 2004. Males are attracted into pheromone traps believing them to be the flightless females they seek for mating as pictured behind the graph.
Source: Unpublished data from the Environment Department.



A general presumption is adopted against any new attempts to introduce, re-establish or artificially maintain populations of birds, amphibians, mammals and reptiles, which are not accepted as native by recognised Island authorities. Determination of the native status of plants and insects is more problematical. Nature is ever changing and it is pointless as well as potentially damaging to take an over-controlling position. However, when considering appropriate management of non-native or species naturalised in Jersey three categories can be identified:

- **Naturalised or non-native species,** which can be detrimental at times. Management decisions need to be made on the control of certain species in the light of factors such as whether the plant is likely to impoverish a habitat by becoming too dominant. An example is sycamore, which can at certain stages of woodland development diminish the diversity of the ground flora and lower canopy.

- **Robust non-native sub-species.** Other introductions of robust sub-species of native species such as Oxeye daisy should be discouraged. The flora of the Island is well recorded, and continuous monitoring of changes in species composition is important for this reason as well as being essential for monitoring the status of local floral diversity.

- **Very invasive non-native species.** The ease with which some animals and plants can assimilate themselves into new areas can cause problems to the existing ecosystems. Non-native species, which are shown to threaten the survival of habitats or species, should be eradicated if possible. For example, Hottentot Fig which dominates sections of the south-west coastal cliffs to the detriment of the native habitat and species.

Pest and diseases

In a predominantly agricultural environment the advent of pests or diseases is a constant threat. The quality of the crop produced or the cropping pattern may be impacted or the natural flora and fauna of the Island could also be seriously affected. For example, the establishment of Colorado beetle, a devastating pest of potato, would lose the Island its pest-free status and prevent it from exporting potatoes into the UK. Additional serious plant pest and disease threats to the Island which could potentially affect trees, vegetation and crops, are gypsy moth, ramorum dieback (also known as sudden oak death which can affect a wide range of plant species), and maize beetle, among others. In the case of gypsy moth low numbers of this serious pest have been recorded for many years, but in the last three years numbers have risen sharply (Figure 7). In the 1980s Dutch elm disease, a fungal disease spread among trees by the Dutch Elm Beetle caused the death of 200,000 elm trees reducing the extent of the Island's hedgerows. That, along with the storm of October 1987, has substantially reduced the Island's woodland area and the connections between them.

3.2 Societal influences

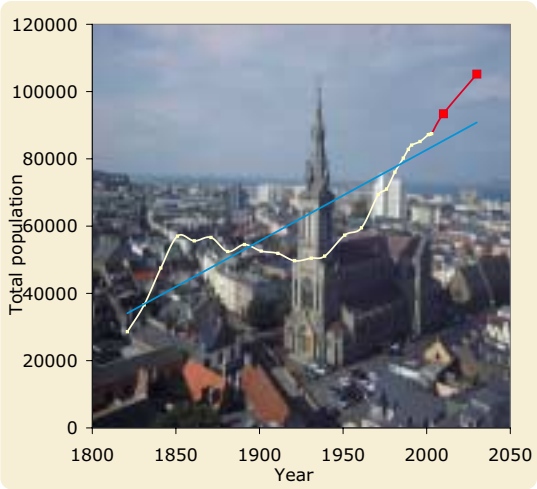


Figure 8 Jersey's population from 1821 to 2001 (yellow line). The blue trend line shows a dramatic population increase. The red line shows the projected population increase under a scenario of 400 net immigration per year (population rises to 106,180 by 2031). **Source:** 'Report on the 2001 Census', States of Jersey Statistics Unit.

3.1.3 Radioactivity

Background natural sources of ionising radiation are by far the bulk of exposure that people may encounter locally on the Island. Radon is a naturally occurring radioactive, colourless and odourless gas formed by radioactive uranium, which is found globally in small quantities in all soils and rocks. The gas can move through the subsoil and into buildings and it is known that exposure to high levels, for long periods, increases the risk of developing lung cancer. Recent work by the Health Protection Unit (Department of Health and Social Services) has shown that 12% of Jersey properties tested have been at or above the recommended action level of 200 Becquerels per square metre. The areas in Jersey of particular concern are those on the granite boundaries/borders and where the boundary is with the rock diorite
These areas of possible higher levels are:

1. Around the granite north-west shoulder of the Island;
2. Around the diorite boundary with granite throughout the south-east of the Island;
3. Possibly on the edge of the granite south-west shoulder around Corbiere.

3.2.1 Population

Jersey's population continues to rise. Whilst on census day in November 2001 the population was 87 186, at the end of 2003 the resident population in Jersey (excluding short-term visitors) was estimated at 87 500 (Figure 8).

The average annual percentage growth in population between 1991 and 2001 was 0.37% and with more than 730 people per square kilometre, the Island is classified as suburban with one-third of the Island's population living in St. Helier. Jersey's population density is approximately twice that of England, which at 380 people per square kilometre, is one of the most densely populated countries in Europe. Despite this Jersey's population density is 20% less than Guernsey and in 1991 in Hong Kong there were 6,450 people per square kilometre, more than nine times that of Jersey. It is projected that net immigration of 400 per annum will produce a population of approximately 106,000 by 2031. However with nil net immigration an initial rise in the population is predicted, followed by a slow fall to 88,000 by 2030. These scenarios have implications for the quality of life, economic progress and the integrity of sustainable environmental goals for Islanders.

Approximately 500 of the overall increase in the population during the last three years is due to natural growth (*i.e.* the excess of births over deaths). Overall migration has been outward with 300 more people leaving the Island than arriving in 2003. This is considered to reflect the fall in private sector employment during the calendar year, notably in the finance and construction sectors from a previous situation of a stable labour market. Nevertheless local people follow the trend of increased longevity observed across the developed world and we face an aging society.

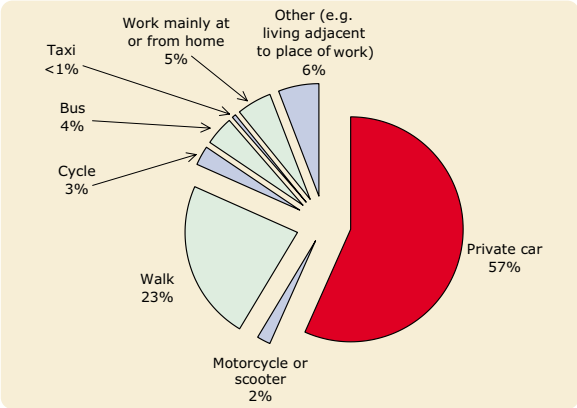


Figure 9 The usual mode of transport to work. Of the 47,082 economically active adults (aged 16 and over) in employment at the time of the 2001 Census, considerably more than half (57%) travelled to work by private car. Almost a quarter (23%) walked to work.
Source: 'Report on the 2001 Census Jersey', States of Jersey Statistics Unit.

3.2.2 Transport

Private car is the main form of transport on the Island and the Report on the 2001 Census recorded the total number of cars and vans owned/used by private households as 52,557 which is a 14% increase from that of 1996 (46,291 cars and vans), which itself was a 9% increase from 1989 (42,395). Car ownership is higher in Jersey than anywhere else in the world; 1.48 cars/vans per private household in 2001. At the time of the 2001 Census, there were 47,082 economically active adults and more than half of this number travelled to work by private car (Figure 9). Clearly, increased car use increases road traffic flows and contributes to urban air pollution, carbon dioxide emissions and noise pollution.

Growth in road transport has a significant effect on biodiversity. As well as new road construction, overcutting of roadside vegetation and culverting of roadside streams significantly damage wildlife habitats. The fragmentation of habitats by roads, combined with the loss of verges due to management practices affects both the potential range of a species and its breeding and social activities such as dispersal. Increases in the size of the airport and harbour also diminish diversity by destroying habitat.

Travel to and from the Island is dominated by air passengers; the 2001 Census Report records that there were just over 1.5 million movements. These comprised almost 1.3 million from the UK and almost 0.2 million from the other Channel Islands. Recently, there has been a picture of decline; and air passenger arrivals fell by 6% (53,000) from 2000 to 768,000 in 2001. Arrivals from the Continent showed the largest decline of 20% between 2000 and 2001. The reason for travel was mostly leisure although business passengers comprised about one fifth of travellers. Overall, in recent years, the total number of passenger and air arrivals has declined and air routes have been lost. In contrast, sea arrivals in 2002 were 2% higher than in 2001 and the total number of sea passengers (arrivals and departures) for all routes was 919,000, which was the highest figure recorded since 1997.

The Island's needs are served by sea freight but the number of commercial vessels entering St. Helier fell by approximately a fifth between 1995 and 2001. A contributory factor to this reduction in number has been the introduction of larger vessels able to carry greater volumes of passengers and freight. The exhaust fumes from the diesel engines of vessels contribute to air pollution and boat traffic such as tugs and ferries create noise pollution that can carry long distances on land or through water. Continuing rises in underwater noise pollution is believed to affect the sonar of many cetacean species causing difficulties in their ability to hunt for food, find mates or communicate with each other. The deterrent effect of noise on marine mammals is well known since noisemakers are used to deter marine mammals from fishing nets and fish pens. Locally resident marine mammals such as bottlenose dolphins must attempt to co-exist with the daily movements of shipments of freight and passengers to and from the Island.

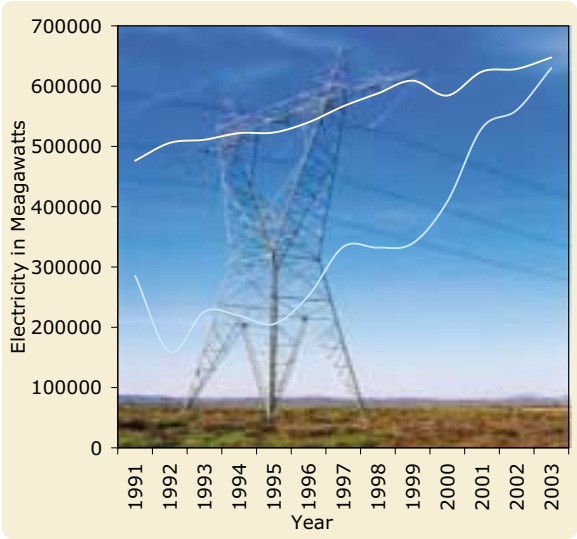


Figure 10 Total electricity supply (yellow) and imports of electricity (blue) consumed from 1991 to 2003. The most dramatic change within the electricity sector has been the growth in imports since the connection to the French supply.
Source: 'Jersey Energy Trends' 2004, States of Jersey Statistics Unit

3.2.3 Energy

In 2003, 99% of Jersey primary energy needs and in particular 97% of electricity was imported. By international standards this is a very high level of import dependency.

Jersey's energy demands are primarily met through petroleum products and electricity. Electricity demand in Jersey has grown steadily over the past 12 years by an average of 2.5% per year (Figure 10). All petroleum products are imported whilst electricity is mainly supplied from France via two submarine interconnectors, with some local oil-fired generation and a small amount generated from waste to energy plant at Bellozanne. In 2003 581,000 Mega watts per hour (MWh) were consumed compared to 476,000 in 1991; this is enough to keep an electric fire running for 24 million days. Nearly a half of all electricity is consumed within homes with government consumption accounting for 30%.

With the decrease in oil-fired electricity generation seen recently in Jersey, electricity prices here have become more insulated from increases in oil prices and as a result, electricity prices have remained unchanged since October 2000, although increases have been announced for January 2005.

Two thirds of all energy used is a kind of petroleum product, with road fuels (petrol and diesel) accounting for a quarter of final energy demand. With our energy needs being met primarily by petroleum products (gas used in Jersey is largely manufactured gas made from Liquefied Petroleum Gas) and electricity, Jersey exhibits quite a low level of diversity by European standards, and is consequently vulnerable to global price fluctuations in oil.

The main changes in energy use over the past 10 years are (Figure 11):

- a rise in consumption of electricity and imports of electricity;
- total road fuel use remaining fairly level with unleaded replacing leaded fuels;
- a reduction in coal consumed.

Sustainable energy polices seek to conserve non-renewable fuel resources and reduce associated emissions. The EU has set a target of 12% of energy consumption to be derived from such sources by 2010. As yet Jersey is not exploiting any of its natural resources contrary to what has been achieved in the UK and some other European countries.

Imported electricity is over 90% free from fossil fuel emissions both at the points of production and use. However, there are other environmental implications associated with the French link, notably France's high reliance on nuclear power and the related issue of nuclear waste disposal. This once again emphasises that

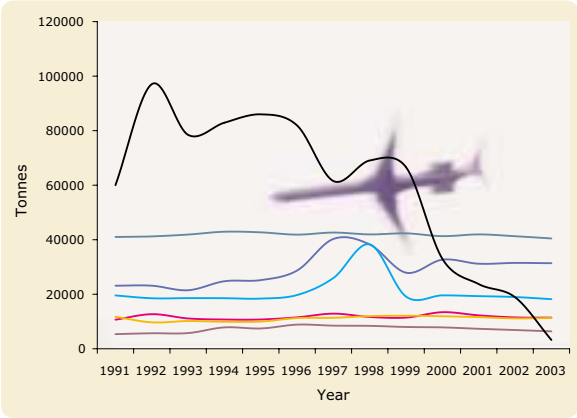


Figure 11 Final consumption of petroleum products. Oil for electricity generation (black), LPG (orange), Kerosene (royal blue), gas oil (light blue), road fuel (green), aviation fuel (pink, Fuel oil (purple).
Source: 'Jersey Energy Trends 2004', States of Jersey Statistics Unit.

most systems for producing, transmitting and using energy have a direct or indirect impact on biodiversity and the ecosystem which we inhabit.

3.2.4 Development

The future of Jersey's landscapes and their associated biodiversity is critically linked to population and development pressures as well as agricultural activity. Jersey's unique marine environment is as important. Continuing reclamation of the foreshore is a serious threat to marine habitats and wildlife as well as posing physical impacts and so is not a sustainable option for the future.

The four maps below show the urban areas of the Island which have risen substantially since 1935. (Source: Jersey Island Plan 1987 and Environment Department)

1935

1965

1982

2002

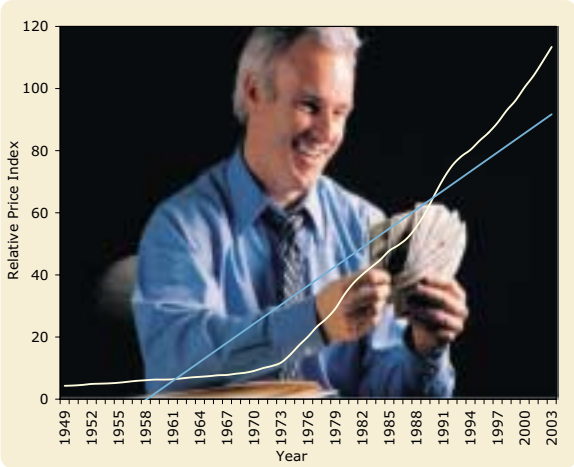
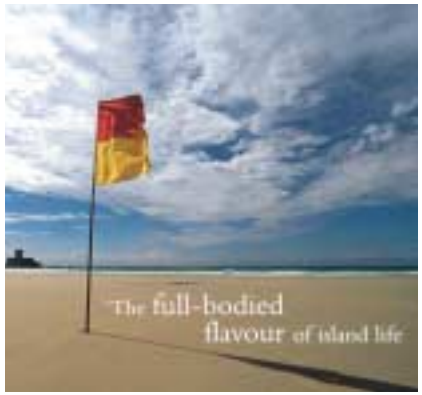


Figure 12 Annual average Jersey Retail Prices Index (yellow line) from 1949 to 2003, the blue trend line shows a marked increase over the period. The Jersey RPI increased by 5.6% in the twelve months to September 2004, in the UK in September 2004 the RPI was 3.1%.
Source: States of Jersey Statistics Unit



House prices in Jersey are expensive; in June 2004 the average house price was £335,000. House prices as measured by the House Price Index rose consistently between 1985 and 2001 and nearly doubled between 1995 and 2001, since then they have remained fairly stable. General inflation continues to rise on the back of international and local price pressures, although underlying inflation as measured by RPI(X) has been increasing more slowly over the past 18 months (Figure 12). Rising inflation and high house prices combine to put pressure on land for development purposes and make construction an attractive way to invest money.

Given high house prices, there continues to be a demand for affordable first-time buyer properties. 'Planning for Homes 2004', a report published jointly by the Environment and Public Services Committee and The Housing Committee, points out that balancing the need for new homes with land availability is complex and must be addressed by the planning process. In order for this to be successful, it is acknowledged that the States must 'continue to maintain and develop increasingly accurate and up-to-date estimates of housing requirements and records of housing land availability'. The Island Plan 2002 proposes 11 sites to be used to meet these requirements and this most recent review suggests that it appears that the current housing land availability situation is healthier than for some years and there is a general balance of demand and supply. This is attributed to the substantial supply of new homes built during 2002 and 2003, which is set to continue for the next few years. Given this situation, it appears that there is no compelling need to change the current planning policies at this time and/or release additional land for housing purposes. The Committees conclude 'indeed, any such considerations might justifiably be regarded as premature, in advance of the major political debate to come in relation to housing and immigration'.

3.2.5 Industry and commerce

Throughout its history Jersey has maintained a number of diverse industries including cod fishing, knitting (the Jersey sweater), ship-building, cider-making, agriculture (Jersey Royal Potatoes and the Jersey Cow), tourism and, more recently, offshore finance.

Finance

To date Jersey's economy has been mostly healthy with local residents enjoying a good standard of living which is delivered primarily by the finance industry. The development of the financial services industry has led to a steady growth in the value of the Jersey economy and economic yield per worker is very high in this sector - for example, in 2003 Jersey's Gross National Income per capita was £34,000 compared to around £19,000 in the UK. Despite a recent downturn in the financial sector, currently approximately a quarter of the workforce is employed within the financial services sector. Jersey is fortunate that this wealth is delivered from this 'low footprint' industry which has minimal demands for land and other natural resources.

Tourism and recreation

Tourism and recreation are central to Island life. The existence of a successful tourism industry helps to

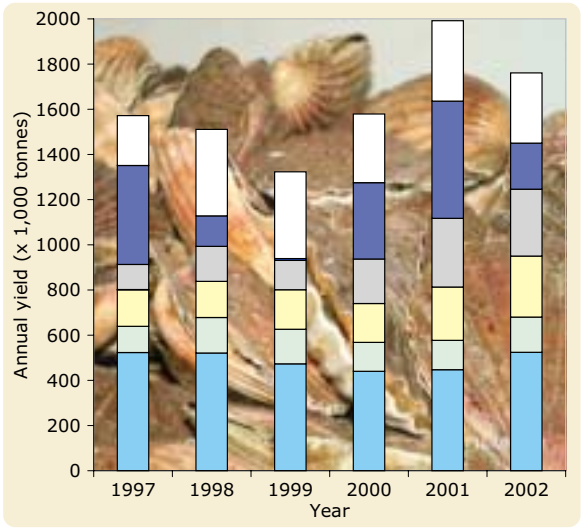


Figure 13 Annual yield of capture fisheries from 1997 to 2002; brown crab (light blue), lobster (green), spider crab (yellow), scallops (grey), whelk (dark blue), wet fish (white). The relative proportions of each catch have remained fairly constant annually, although 1999 was a bad year for whelk exports due to a dip in global markets.
Source: Department of Agriculture Annual Reviews 1997 to 2003.

support a wide range of local facilities and services such as shops, restaurants, leisure and transport facilities. In the 1950s there was a waiting list to come to Jersey but tourism numbers in the Island have been in decline since the mid-1980s and have decreased sharply since 1988: in 2001 and 2002 the total number of staying visitors fell by 8%, to 429,700. All months, with the exception of January, showed declines in visitor number, notably June to September. As the market has declined, hotels have been sold for other uses (principally residential) thereby reducing the number of beds by approximately 7,500 (27%) between 1980 and 1999. A further 1,600 bed spaces were lost for the 2000 season. Despite these declines the hotel and restaurant sector remains important to the economy, employing about 12% of the workforce in June 2004.

Travel to and from the Island has environmental costs as well as increased pressure on the transport infrastructure locally. However, due to the decline in the number of visitors to the Island, The Jersey Statistical Review notes that the number of hire cars has declined by half over the last 10 years and the number of operators by more than one third during the past 5 years.

It is increasingly recognised that the most important part of the tourism product is the Island's natural beauty. Nevertheless it is accepted that the current strength of sterling and the relative high cost of transport to the Island make it an expensive destination compared to some. Encouragingly, the Island is beginning to show potential to gain market share from both the business/conference sectors and the short break activity/sport/recreation tourism and cultural tourism markets, by promoting its natural qualities. These are growing sectors and, because they are relatively high value, are more sustainable sectors of the industry both economically and environmentally.

In contrast to the changing demand for tourism in the Island, the demand for recreation and cultural activities has been steadily growing over recent years as people increasingly desire 'value for time', greater self improvement and a healthier lifestyle. There are Island-wide benefits to be gained from the provision of recreational facilities: better health, social benefits (by providing a sense of personal and community well-being) and the provision of dual facilities for schools. Despite these benefits, there needs to be careful balancing of conflicting land uses to take account of this.

Fisheries

Fishing has always been an important use of Jersey's coastal and marine environment. Today, activity focuses around the 210 vessels which are licensed to fish the 800 square miles of Jersey's territorial waters. In addition, under bilateral agreements, 100 French vessels per annum regularly fish in Jersey waters and there is also active recreational angling from boat and shore as well as low-water fishing activity. The exploitation of Jersey's marine resources contributes significantly to the Island's economy: the commercial fleet lands 1,342 tonnes of shellfish and 363 tonnes of wetfish per year, which is worth about £9 million per annum (Figure 13); the fish farming sector contributes another £1m per annum to the economy along with all the associated industries and businesses (Figure 14); and it is estimated that anglers from the shore or vessel as well as low water fishermen collectively spend between £0.75 - £1 million annually on this pastime. Fishing is

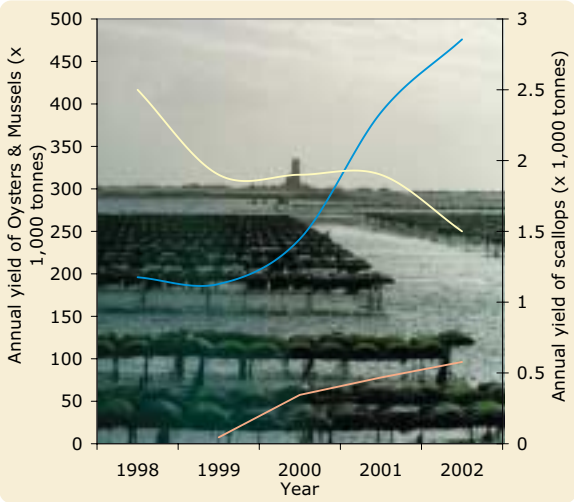


Figure 14 Annual yield from aquaculture from 1998 to 2002; oysters (blue), mussels (pink) and scallops (yellow) on the second axis. The scallop yield has recently declined due to the lack of available seed for farmers to purchase.
Source: Department of Agriculture Annual Reviews 1997 to 2003.

also an important part of Jersey's past and existing cultural and social heritage, especially low water fishing for ormers and other species.

Recent years have seen a widespread public focus on the environmental impacts of fishing, with reports of crises in fish stocks etc. Fishing intervenes directly in the coastal ecosystem affecting target fish species, those caught accidentally, and those damaged by the passage of fishing gear. Fishing gear is also one of the main sources of litter on beaches, predominantly from plastic ropes and net. The type of gear used plays an important role in the environmental impact of the activity. Fishing off Jersey targets a variety of catches; the main catches are:

- Crabs & lobsters: caught in pots and to a lesser extent tangle nets, these are the staple catch for many of the boats in Jersey. The environmental impact of the static gear i.e. pots is fairly low as they specifically target the species, produce very little by-catch and do minimal damage to the seabed. Jersey was also one of the first areas to introduce 'escape gaps ' in parlour pots, which allows undersized crustaceans to avoid capture. There has been an increase in the use of tangle nets for capturing spider crab in recent years.

- Wet-fish: the wetfish catch is dominated by sea bream with bass, conger and flat fish such as plaice and sole all playing an important role. The main method of catch used are trawls, mesh nets and trammel nets, which run over the seabed targeting bottom-dwelling fish. Trawling, by its nature, is less targeted in the species it catches up and so particularly the heavier gear has the potential to be damaging. The Joint Advisory Committee is moving legislation to ban larger beam trawlers from the Baie de Granville.

- Other shellfisheries include scallops, which are both dredged (80%) and hand-picked by divers (20%), and whelks, for which pots are used. Dredging can be highly damaging for the seabed. The environmental impact of the diving activity on the seabed is minimal and in addition, limitations of the length of dives at depth and the imposition of a size and bag limit on recreational divers helps to sustain this fishery. The capture of undersized whelks has been a problem in the past, but active enforcement has helped resolve this issue.

The future of the industry relies on continued self-sustaining populations of fish, which means that fishing activity must be at levels which the fish populations can support. At present, stocks levels in Jersey appear healthy, although a lack of data for some species makes objective assessment of the health of the stocks very difficult, if not impossible, particularly of non-commercial species.

Arable and horticulture

Agriculture has been and continues to be a fundamental shaping force of Jersey's landscape. It has given rise to our heathlands, the pattern of field boundaries and sunken lanes and has largely created the habitats

available in today's Island - creating arable fields and grazed pasture and meadows but reducing woodland and wetlands through clearance, drainage and infilling. Mankind has been farming the Island's soils since the Neolithic period and, over these thousands of years, different industries have taken precedence, all making their impact on our landscape. Tree clearance for agriculture, wool production, ship building, cider production, dairy and arable farming, have all, over the centuries, combined to create the rich mosaic of fields, boundaries, lanes and the open landscape for which the Island is justly renowned.

The relative profitability and stability enjoyed by the cropping industry was achieved through the success of the early Jersey Royal Potato culminating with the award of a PDO (Protected Designation of Origin) under the EU protected food name scheme in 1996. Currently however, Jersey agriculture is under pressure from increased competition to both of the Island's major crops; Jersey Royal Potatoes and glasshouse tomatoes. This pressure comes from other EU producers as a result of improved transport links with the UK coupled with changing consumer demands and governmental policies both in the EU and in Jersey. Agriculture and horticulture have never been static industries and have had to adapt to these factors in order to survive. However it is recognised that the costs of production in Jersey are higher than most (if not all) of its competitors mainly due to Island economics; production costs are high due to the scale of farm units, high input costs and shipping.

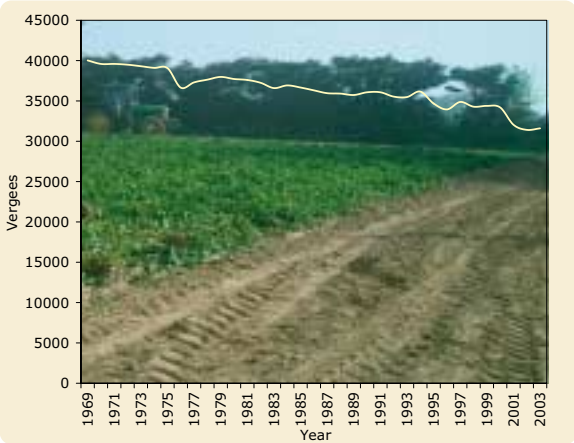


Figure 15 The decline in area of land farmed between 1969 and 2003. **Source:** Annual returns of the Jersey Agricultural Census, Economic Development Department.

According to the latest Agricultural Statistics (2003) the last 10 years has seen the area of land used for farming decrease by 13% (Figure 15), the number of holdings fall by 39% and the labour force shrink by 37%. But in the same period the average holding size increased by 43% and the industry has become more efficient. It is not possible to apportion the causes of this decline in detail but it is suggested that much of this loss can be attributed to development, the reversion of marginal land or change of use for community projects.

Jersey's countryside is well understood to be a strategic asset, both in attracting tourism and creating an ambience to the Island that makes it an attractive place in which to locate and staff businesses. Despite significant annual subsidies from Government, profitability has fallen in both the arable and dairy sectors leading to a contraction in agriculture and the area of land it occupies. Land rents are falling and parcels of land are becoming untended - the reliance on profitable agriculture to manage the appearance of the countryside can no longer be taken for granted. Glasshouse units have been abandoned in several locations and are becoming derelict and unsightly but policies requiring the removal of such glass and the restoration of the site are not backed up by an appropriate fiscal mechanism. Calls for relaxation of development controls are being made to allow landowners to bolster their falling incomes by selling off land for development.

At the same time requirements relating to environmental performance and animal welfare in farming practice are becoming more stringent as customer demands in UK and European marketplaces are passed on through the supply chain. In addition, there are domestic requirements for better practices to protect water quality from pollution. It is now widely accepted that the majority of water pollution comes from agricultural sources, from the historical application of nitrate fertilisers to the Jersey Royal crop and from disposal of slurry from

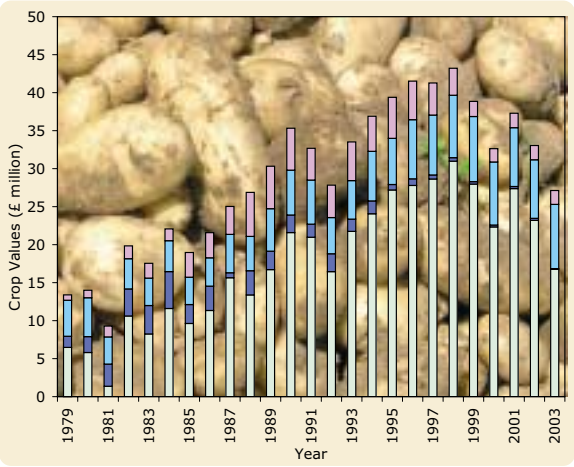
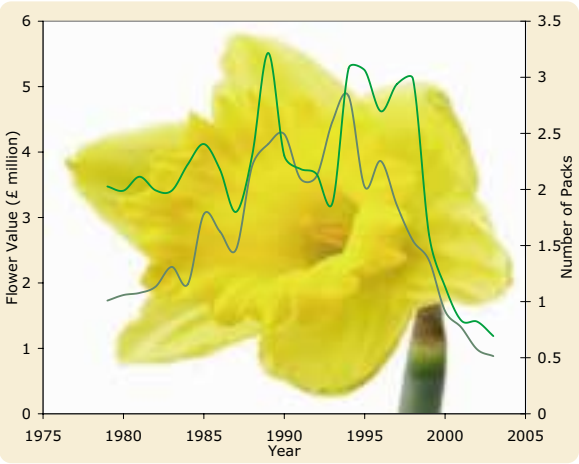


Figure 16 Vegetable export value for potatoes (green), cauliflower (blue), tomatoes (light blue) and other vegetables (lilac) from 1979 to 2003. Note the highest export values were in the late 1990s. Recently crop values have declined and the winter crops are no longer produced in any quantity.

Figure 17 Export values of cut flowers (dark green line) and total number of packs exported (light green line) from 1975 to 2003. Note a decline in the export market, this is due to a reduction in the area of daffodils grown and glasshouse produced flowers for export. An increase has been seen in flowers produced for sale in the local market.

Source: Department of Agriculture and Fisheries, Annual Statistics Reports from 1979 to 2003.



dairy cows. However, a small but significant percentage of pollution also originates from private drains systems (soakaways) as well as atmospheric deposition.

Although there is volatility within the marketplace, gross export values in 2003 have almost halved from their 1998 values of £31 million. Traditionally brassicas followed potatoes in the rotation but again the areas of these traditional crops have collapsed. Markets are unpredictable and can change from year to year (Figure 16 and 17). Glasshouse tomatoes have seen a slow decline in the area grown with export values relatively static. However increasing costs, especially fuel, and the recent enlargement of the EU to include Poland, which is developing its modern glasshouse industry, has put this particular sector of the industry under even greater pressure.

The Dairy and livestock industry

Mixed farming has always played a significant part in forming the Island's landscape, when people have been able to afford stock. Larger smallholdings kept livestock, such as pigs, cattle, sheep and goats. Those living in properties within certain fiefs had, and still have, the right to collect fodder and bedding and to graze stock on areas of 'shared' ownership - Communes. This management regime has been fundamental in shaping the Island's heathlands. These marginal areas, and others, such as the wet valley floors and sand dunes, were managed by grazing for millennia because the soil conditions were poor for arable farming. The vegetation communities and the animals and insects that they support have developed because of the centuries of this management, and now are becoming degraded as the management regime no longer occurs. Low growing heather and gorse scrub gets taller, and grasslands change in species composition as they are no longer harvested by man and his animals. Large areas of open grassland, become ranker and plants such as bracken, bramble and gorse spread, and alter the soil characteristics and reduce the species diversity of the habitats. Whilst cattle still play a fundamental part in Jersey's agricultural industry, changes in economics and modern agricultural practice mean that it is not viable to graze as extensively as it has been in the past, and the marginal areas of our Island now suffer from neglect, causing habitat change and impoverishing low growing plant species and the diversity of fauna they maintain.

The dairy industry based on the world famous Jersey Cow has been a fundamental part of Jersey agriculture for many centuries. The unique qualities of the Jersey breed were first recognised by an Act of Legislation in 1763 prohibiting the import of cattle from France. This was followed by several amendments by the States of Jersey culminating in all cattle imports being prohibited in 1878. The Jersey Herd Book was founded in 1866 which enabled the Jersey breed to make faster genetic progress in bodily conformation and milk production than other breeds in other countries. The Jersey breed has been widely exported over the last 200 years with thriving populations in the UK, USA, South Africa, Australia, New Zealand, Denmark and many other countries around the world. Numerically, the Jersey is the second largest breed of dairy cattle in the world with the Island being recognised as the "home of the breed".

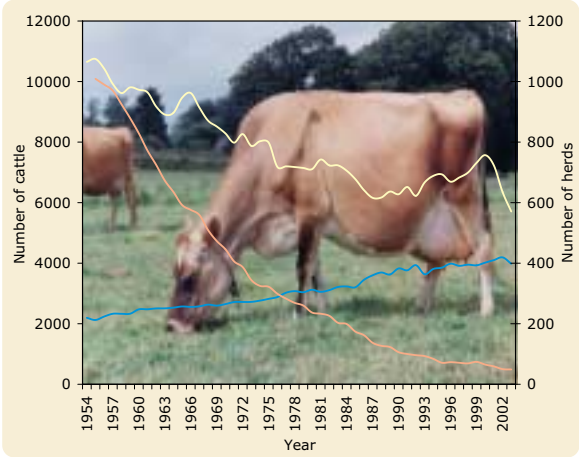


Figure 18 The decreasing number of cattle (yellow line) and number of herds (pink line, second axis) compared with increasing average annual yield per cow (blue line) from 1954 to 2002
Source: Department of Agriculture and Fisheries, Annual Statistics Reports from 1954 to 2003.

Yet the shape of the industry has changed substantially (Figure 18). Up to the year 2000, it enjoyed stable milk pricing and a level of financial assistance from Government which generated reasonable profits for the majority of dairy farmers in Jersey. Over the last decade of the 20th century milk production in the Island grew considerably with Jersey Milk able to maintain returns to dairy farmers because of their monopoly on liquid milk supplies and an ability to export any excess milk as mini pots to the UK on a profitable basis. However in 2001 the export of mini pots came under considerable pressure due to increased competition in the market leading to reduced returns at Jersey Milk and lower milk prices for Jersey dairy farmers.

Recently, two restructuring schemes offered farmers an exit opportunity with financial incentives; these were financed jointly by Government and Jersey Milk. This resulted in the removal of four million litres of milk and 1,000 cows from the Island milk supply in 2002. The above, plus efficiency improvements on individual dairy farms and major restructuring at Jersey Milk, including a change of name to Jersey Dairy, has led to recent milk price increases resulting in a marginal improvement to on-farm profitability. This recovery in profitability in 2003/4 has yet to reach the level of return enjoyed historically. However further improvements in profitability are due to the introduction of a new range of value added products by Jersey Dairy (*e.g.* cheese and ice-cream) and an ever-increasing level of efficiency on individual dairy farms.

3.2.6 Public perception of the environment

Overall there is a positive outlook to the unique quality of Jersey's 'natural' environment within the community. Its value and importance are consistently high on the agendas of public debate; it is strongly featured in primary education and its value to the community is underlined by the number of non-government organisations actively working to increase public awareness concerning a variety of environmental issues. However, a report commissioned to assist in the development of The Sustainability Strategy (Romeril 2001) noted that while the groups exhibited a strong aesthetic appreciation of the Island's landscape and natural beauty, "there was little awareness of the ecological importance of any of the habitats on Jersey, nor was there much concern about nature conservation expressed by the groups. Maintaining and enhancing biodiversity, a fundamental element of sustainable development strategies, was not salient for group members."
This disappointing conclusion suggests that despite the general perception, a significant amount of educational work is required to raise this issue among the general public.

Recent trends during the past few decades of growing prosperity, increased car ownership and more leisure time have heightened interest in the natural environment resulting in greater pressure on an already limited resource. Such pressure, including 'economic development', has resulted in the loss of vital habitat during the last two decades. Examples include the increase in the size and number of golf courses, extensive land reclamation, and the construction of a new marina, extended mineral excavation licensing and the development of green field sites for housing. Nevertheless, despite the ecological impact of these developments, the vision for the future within the Island's 'Strategic Plan 2005-2010' allows for some

optimism in that there is recognition of the importance of a healthy environment to underpin economic success. This is reflected in a number of the States' Key Strategic Aims detailed in the document.

There appears to be stronger awareness and concern for 'natural' environmental issues than for 'green' issues generally. Although the public perception of waste and recycling, energy conservation, water quality and traffic pollution and density appears to be positive, stated views are not always reflected in actions. Jersey's community is still largely a 'throw-away' consumer society, possibly due to self-interest and a resistance to change among individuals and industry. It may be that the only way to attain a full state of awareness in these areas, recycling for example, would be through legislative or fiscal measures introduced at parochial or government level as in other countries.

Jersey also lacks the range and nature of public voluntary bodies that exist in the UK and offers them no financial support which would otherwise enable them to provide more extensive informed comment on Government policy, act as conduits for Government-funded education and carry out awareness-raising campaigns. Nevertheless, although it will always be on a different scale, non-governmental organisation activity in Jersey can and has contributed significantly to the awareness raising process and study of local species.

3.2.7 Recreation

The public has unrestricted access to 97 km of footpaths and 500 hectares of habitats, including wetlands, woodlands, maritime heath, sand dunes and dry grassland. With more leisure time and easier access to nature reserves, maintaining a sustainable balance that will enable future generations to enjoy Jersey's wild areas *and* maximise the diversity of species, is a vital and on-going task.

St. Ouen's Bay is an example of an area that typifies the contradictions that can arise. A sense of remoteness and the quality of the natural environment make it a popular destination for residents and tourists seeking quiet and informal recreational pursuits such as walking, bird-watching, fishing, surfing and beach activities. Yet the presence of older commercial buildings as well as occasional sand racing, car sprints and powerboat racing, causing noise and air pollution, is completely out of character with the Bay and sends a confusing message to residents and tourists in a place set aside on account of its uniqueness and undeveloped character.

Similarily, on the heathland at Les Landes, deep rutting has occurred on and off the footpaths which increases erosion. This damage takes many years to heal. La Mielle De Morville was restored from a municipal waste disposal site in 1978 to take recreational pressure away from Les Blanches Banques (the sand dunes), an aim which has undoubtedly been achieved. There is still, however, an erosion issue on Les Blanches Banques due to activities such as sand surfing, which in turn create blow outs resulting in a net loss of vegetation cover and sand from the area.

3.3 Releases and discharges

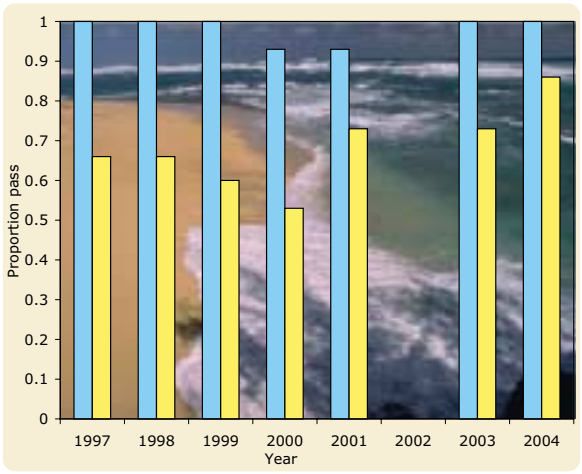


Figure 19 Jersey's bathing water compliance with EC imperative standards (blue bars) and the more stringent guide standard (yellow bars). 2002 is absent due to analytical problems.
Source: Environmental Protection Unit, Environment and Public Services Department.

3.3.1 Discharges to water

Bathing waters

The quality of bathing water around Jersey's coast is important for a number of reasons:

- The health of the public swimming and those involved in watersports
- Pollution of the environment
- Jersey Tourism prides itself on having some of the cleanest beaches in Europe
- Aquaculture such as farming of oysters and mussels etc.

In general local bathing water quality is good and in 2004 all 14 sites tested achieved the Imperative Standard of the EC's Bathing Water Directive and 12 sites achieved the more stringent guide standard (Figure 19). However, waters are at risk from diffuse or point source pollution arising from the land and washing out onto the beaches.

In the past, samples taken at First Tower, which is close to the combined outlet of the sewage treatment works and the stream draining the Bellozanne catchment, have failed for both total and faecal coliform organisms *i.e.* bacterial load. Sampling at other bathing sites Islandwide has demonstrated a decrease in bacterial water quality at some sites following rainfall. These sites are usually subject to run-off from land. This would indicate that the bacterial loading arising from the surface water catchment is the principal bacterial input reaching the First Tower outfall at both high and low flows, as opposed to the effluent produced at the STW at Bellozanne which is treated by ultra-violet to a very high standard.

Freshwater

Drinking water is available from either the public water supply provided by Jersey Water (formerly The Jersey New Water Works Company) or privately from domestic bores and wells.
Bores and especially wells are subject to possible pollution from pesticides, harmful bacteria, microscopic parasites such as Cryptosporidia and Giardia and also may be high in nitrates arising from farming practices and seepage from private soakaways. Private water supplies are also most vulnerable to pollution from agro-chemicals (e.g. herbicides, fungicides and insecticides) and bacterial run-off from fields where slurry has been spread. The extensive use of pesticides, especially herbicides, Islandwide has meant they are detected in the Island's water supply and some consider that the health effects from these chemicals may be of more significance than nitrates. There are five major routes by which pesticides can pollute watercourses :-

- Run-off from a crop or treated area,
- Spillage of concentrate
- Leaching through the soil
- Spray drift falling outside the crop area
- Incorrect application techniques

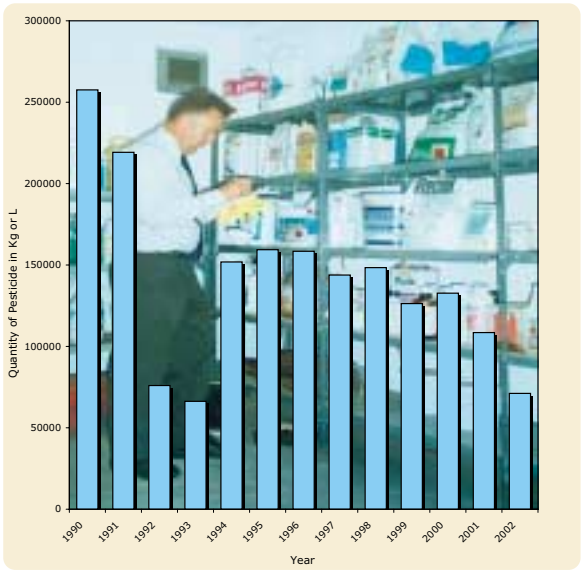


Figure 20 Import levels of pesticides (fungicides, herbicides, insecticides and nematicides) from 1990 to 2002 showing an overall decline over the recorded period. Please note, that due to data collection problems, 1992 and 1993 do not show complete data sets. **Source:** Department of Agriculture and Fisheries, Annual Statistics Reports from 1990- 2003.

The quality of the public water supply is also a matter of concern with nitrate levels arising from diffuse pollution occasionally in excess of 50 mg/l (EU and World Health Organisation Standard).

A record of the amount of fertiliser and pesticides imported into Jersey is provided by the agricultural merchants on a voluntary basis. Fertiliser recommendations are given to the industry based on crop requirements according to standards of best practice (Figure 20).

Recent changes in dairy practices have impacts on the environment with the modern dairy herd usually being housed from mid October to mid April and grazed for the remainder of the year. During the housing period, slurry, manure and dirty water is produced and should be collected and stored. This product has the potential to be used as a fertiliser according to crop need rather than as a waste product in need of disposal. However, a feature of modern economics-driven farming is the concentration of cattle into fewer and bigger herds; this trend is seen in nearly all developed countries and Jersey is no exception. It means that although there is less slurry and manure to spread on land, because of the increased numbers in each herd there is a need for investment in storage facilities on some dairy farms whilst others have already constructed adequate facilities.

3.3.2 Emissions to air

Polluted air harms human health, causes damage to buildings and generally reduces our quality of life. It particularly affects the most vulnerable in society - the very young and the old. On a global scale, some of the air pollutants we produce concentrate in the Earth's atmosphere causing acid rain or contribute to the greenhouse effect.

Transboundary air pollution

Given the lack of heavy industry on the Island and the distances to other large land masses, local contribution to acidification and transboundary air pollution is not considered to be an issue of the highest importance. Nevertheless, Jersey must work towards meeting its obligations under the Convention on Long-range Transboundary Air Pollution. This requires the reduction of pollutants associated with the deposition of acidifying species, for example sulphur dioxide and nitrogen dioxide which can undergo chemical reactions in the atmosphere to produce acid rain. The adverse effects of acid rain are widely recorded, often falling far from its point of origin after being transported sometimes long distances through the atmosphere, before being precipitated.

Local air pollution

Managing local air quality is a priority for the States of Jersey. Car exhausts are the most common origin of local pollutants. Jersey has one of the highest car ownership levels in the world (Figure 21). The number of vehicles per kilometre of road, and traffic flows continue to increase annually and approximately one third of

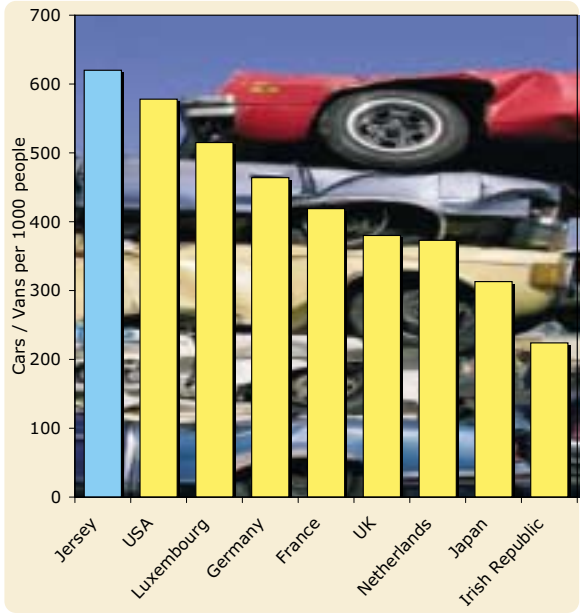


Figure 21 The number of cars/vans owned per 1000 people in Jersey (blue bar) compared with other countries (yellow bars).
Source: 'An Air Quality Strategy for Jersey', AEA Technology 2003.

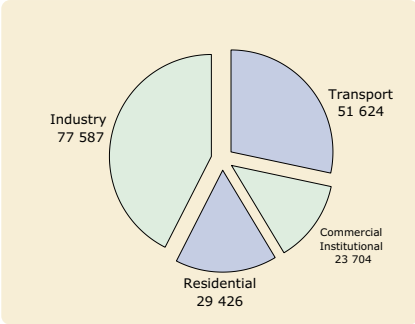


Figure 22 The main contributors of carbon dioxide emissions for Jersey in 2000. Figures are annual tonnes of carbon produced.
Source: 'Greenhouse Gas Inventory, Jersey 2000', Coley and Romeril 2000.

Jersey's greenhouse gas emissions arise from vehicular activity. It is an inescapable fact that a reduction in car usage and cleaner fuels and vehicles will be essential to meet our international obligations. Aside from carbon dioxide (CO_2), nitrogen oxides (NOx), carbon monoxide (CO) and small particles are also formed by the high temperature combustion of fossil fuels in car engines.

In the report 'An Air Quality Strategy for Jersey' (AEA Technology 2003) the principle air pollutants of concern are nitrogen oxides and particulates which are respiratory irritants that may exacerbate asthma and possibly increase susceptibility to infections. In the presence of sunlight NOx reacts with hydrocarbons to produce photochemical pollutants such as ozone. AEA Technology (2003) attribute approximately 68% of the total local emissions to road transport sources and note that because many of the streets in St. Helier are canyon type streets, air pollution takes longer to disperse and is less affected by wind speed and direction than say an open site. They point out that in 2001 approximately 30% of vehicles were over 10 years old and the UK Automobile Association has stated that 50% of carbon monoxide emissions are produced by just 10% of vehicles with poorly adjusted engines.

Small particulates or PM_{10}s (with a diameter less than 10μm) have well documented impacts on human health, including effects on the respiratory and cardiovascular systems, asthma and mortality. They are comprised mainly of carbon resulting from primary combustion processes such as from car engines, the municipal waste incinerator, the crematorium and the power station stack. PM_{10}s also comprise secondary particles from other chemical reactions in the atmosphere as well as natural particles e.g. wind-blown particles and biological e.g. spores.

Further reactions can produce ozone which at ground level is a pollutant that reacts easily with biological material. Volatile organic compounds (VOCs) arise from evaporation of chemicals, paints and during the transfer of petrol whilst lead arises from car exhausts and various industries. In 1999, AEA Technology (2003) estimated that the aircraft and shipping movements to the Island equated to emissions of approximately 47 tonnes of VOCs per year.

We have already shown that one third of carbon dioxide emissions arise from local transportation (Figure 22) but air travel to and from the Island and onward is equally, if not more, damaging. For example, a return air trip from London to Rome uses 160 kg of fuel per passenger and the total greenhouse gas emissions per passenger is estimated to cause a warming effect equivalent to 1,500 kg CO_2.

Previously, sources of emissions included the now largely unused power station at La Collette. In 1999, despite not operating to capacity, its emissions were estimated at 384 tonnes of NOx whilst the municipal waste incinerator emitted 464 tonnes of NOx in 1999 (AEA Technology 2003). It exceeds EU standards of emissions and even more stringent emission legislation are enforced throughout Europe by the end of 2005. The emissions of both sources will be dispersed seawards during certain weather conditions.

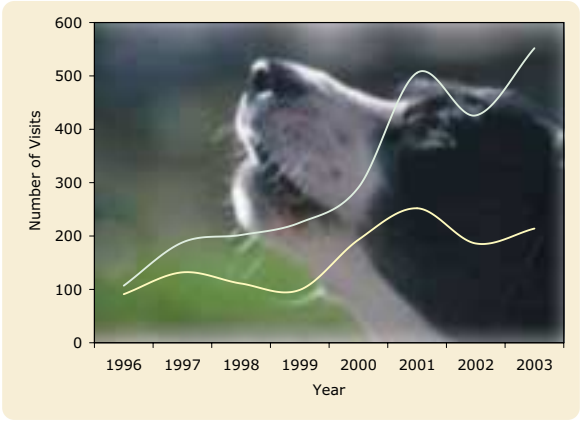


Figure 23 The number of visits made by the Health Protection Unit in response to noise complaints (mint line) and other nuisance complaints (yellow line) between 1996 and 2003.
Source: Health Protection Unit, Health and Social Services Committee.

Noise

As well as being disruptive and annoying, noise can damage health, yet overall noise levels appear to increase with economic development, particularly in association with increased construction and maintenance of infrastructure such as road works. It is widely accepted that high levels of noise in the workplace can induce hearing loss, with particular occupations at high risk. Furthermore leisure time activities can also expose people to potentially hazardous noise and instances of preventable hearing loss in children and young adults are reported. Biodiversity can also be affected by consistent low frequency noises *e.g.* marine mammals and low frequency boat engine noises or terrestrial wildlife and unexpected noises such as firework displays.

In 2002, the Health Protection Unit made 426 visits to assess noise; around 4 visits per 1,000 population. This was a reduction from the 2001 figure of 501 visits (Figure 23). The department receives complaints regarding excessive noise from a range of sources:-

- Domestic noise: barking dogs, loud music, parties etc., poor sound insulation between dwellings;
- Industrial and commercial noise: from machinery, such as air conditioning fans or compressors, industrial processes for *e.g.* cutting of steel, noise from licensed premises etc.
- Construction site noise;
- Aircraft noise: aircraft over-flying, landing, taking off and ground noise;
- Road traffic noise.

Action can be taken against individuals or companies/organisations that cause unreasonable and persistent nuisance under The Statutory Nuisance (Jersey) Law 1999, which came into force in June 2000. The Health Protection Unit already deals with many of these complaints through mediation without recourse to legal action.

3.3.3 Discharges to land

Slurry

Ideally, organic manures would be utilised as a resource being spread on fields as a fertilizer according to crop needs. However, the main problems associated with their management is the lack of storage on some dairy farms, which can lead to the application of manures during the autumn and winter periods when crops are not growing actively. Applying slurry and dirty water to bare, saturated or compacted land can result in runoff into local surface waters and /or a loss of nutrients through leaching into underground waters. A reduction in water pollution problems and the application of fewer purchased inorganic fertilisers could be achieved by those dairy farms that currently do not have at least four months effluent containment investing in increased storage facilities, erected to meet UK building standards.

Sewage sludge

There is a need for disposal of the main by-product of the Sewage Treatment Works in Jersey, *i.e.* the solids that are settled out to form sludge. At present once this sludge has been decomposed further it is either spread as a liquid that is injected under the surface of land or spread on the surface; this latter practice will cease in 2005. Approximately one third of the sludge is currently spread to land, but changes in current practices and environmental standards are leading to this being discontinued in the medium to long-term. During the decomposition process 'bio-gas' is also produced: some is used to produce electricity, a proportion of which powers the plant whilst some is sold to the Jersey Electricity Company (approximately 1.5 million units were produced in 1997); some is used as a source of fuel to dry sludge in the sludge drying plant and some is used as fuel in boilers, which heat the digesters providing the right conditions for micro organisms to break down organic matter.
The plant, commissioned in 1991, can treat both settled and digested sludge and normally it dries 127 tonnes of digested sludge every day. This produces approximately 750 tonnes annually of the granular end product which is used as an agricultural soil conditioner.

Agro-chemicals

There are a number of ways that the countryside can be affected by pesticide use, by spray drift reaching hedgerows, and affecting non-target plants and animals. Birds and mammals are particularly at risk from pesticides in granular or pellet form. Fertilisers containing nitrogen, if applied through unguarded spreaders, could reach the bottom of hedges so indirectly having a detrimental effect on natural flora and fauna.

Agricultural waste

Prior to 2002 green waste was disposed of at the Crabbé site, St. Mary. However, due to a pollution incident, Crabbé was closed and currently agricultural waste is disposed of on agricultural land according to guidelines provided by the Environment Department. This practice should ensure that the rate applied does not exceed the allowed annual nitrogen input to land, and is applied in a manner to ensure pollution does not occur. Over time this practice may prove to be unsustainable due to the build up of plant pests and diseases. The Island's green waste is now processed at the La Collette site in St. Helier.

Contaminated land

Land becomes contaminated when it contains substances that when present in sufficient concentrations, may harm humans, flora and fauna or the environment. Jersey is fortunate to not have a history of heavy industrial uses which in many other countries have left a legacy of contaminated sites. However, a number of key sites in Jersey are affected by contamination and certain historic and current practices have caused and have the potential to cause contamination of land. Contamination can also occur naturally. In many cases land has in the past been used to legally or illegally dump hazardous waste which is then built on. Examples of industrial or commercial operations which may result in contaminated land include:

Type of operations	Possible contaminants
Old gas work sites	Cyanides / phenols / polycyclic aromatic hydrocarbons
Scrap yards	Metals, hydrocarbons, asbestos
Petrol stations	Petrol / diesel from leaking underground storage tanks, fuel additives
Reclaimed land filled with domestic / hazardous waste / incinerator ash	Heavy metals, leachate, methane
Land fill sites	Heavy metals, leachate, methane
Industrial plant waste storage or treatment facilities	Heavy metals, hydrocarbons, asbestos

For a site to meet the definition of contaminated land, a pollutant linkage must be established. A pollutant linkage consists of three parts:

i. A **source** of contamination in, on or under the ground
ii. A **pathway** by which the contaminant is causing significant harm (or which presents a significant possibility of such harm being caused)
iii. A **receptor** of a type specified as follows *i.e.*

Human beings	
Eco-systems	Local nature reserves Sites of Special Interest Any other Ecosystem identified in a biodiversity action plan
Property	Buildings Conservation areas Ancient/scheduled Monuments All crops Produce grown domestically or on allotments Livestock Park or garden of special historic interest Owned or domesticated animals
Water	Ground waters - major aquifers Inland waters (lakes, rivers, streams - including the bed if dry) Drinking water abstractions - public and private Non drinking water abstractions - industrial and agricultural

Source (Contamination) → **Pathway** (Pollutant linkage via air, soil or controlled waters) → **Receptor** (Target)

If the three components of the pollutant linkage exist, a risk assessment must be undertaken to determine the likelihood of harm being caused, and the likely nature and extent of the harm caused if the predicted event actually occurred.

3.4 Abstractions and removals

Developers who purchase land not knowing it is contaminated may find it becomes worthless or uneconomic to develop. Depending on proposed usage it may be necessary to clean/ remediate it to an agreed standard set by the regulator(s). If clean up/remediation is insufficient, house sales may be delayed until the lending institutions are satisfied there is no future liability. It is important therefore those considering purchasing land satisfy themselves it is not contaminated or can be remediated and mostly this cannot be assessed visually. This can be done by instructing the services of a company or consultant who specialise in this type of work.

3.3.4 Radioactivity

There are three known potential sources of man-made radioactive nuclides and monitoring has determined these provide minimal risks (section 4.5.4). The UK government disposed of 28,500 barrels of radioactive waste from 1950 to 1963 in a part of the English Channel known as the Hurd Deep which lies in UK territorial waters north of the Alderney. Up to 1982, disposals of packaged solid waste of low specific activity were made to an area of the deep Atlantic Ocean.

Cap de la Hague is a commercial nuclear reprocessing plant run by Cogema on the coast of France some 22.5 km from Jersey. Spent nuclear fuel is shipped and transported terrestrially to the site where plutonium is separated from the spent reactor fuel and the waste radioactive effluent is discharged into the sea via a pipeline. Dispersal means that the manmade radioactive isotopes are spread more widely over a larger area and some of them reach our shores. The nuclear power station at Flamanville, France is also a source of man-made radiation and there remains the legacy of weapon test fallout from the 1950s.

3.4.1 Water

Jersey Water provides a public water supply from a network of reservoirs. The reservoirs collect water from rainfall and from groundwater abstraction. There is only a certain amount of recharge, all derived from rainfall into groundwater each year, and of this recharge, some is needed to support connected ecosystems (whether they be surface water bodies or terrestrial systems such as wetlands). Under good management, only that proportion of the overall recharge not needed by the connected ecosystems should be abstracted. This proportion is the sustainable resource and best practice limits abstraction to that quantity. There is currently little information on the quantities of surface or groundwater utilised, nor are there any restrictions on water abstraction.

The Island is dependent primarily on the amount of rainfall received for its water supply. For example, a long, hot, dry summer in 2003 led to the need for Jersey Water to bring the Desalination Plant into use at full capacity to augment natural resources and to reduce the rate of decline of the reservoir's water levels. Finally the Water (Jersey) Law 1972 was invoked and the use of water for non-essential purposes was prohibited.

This is in contrast to 2002 when rainfall was recorded at close to long-term average levels and all the reservoirs were full and the streams were running to capacity by early December. Despite this dependence on the prevailing weather and predicted changes in rainfall patterns as a result of global warming, water demand continues to rise.

Approximately 10% of the Island's population rely on a private water supply for their drinking water. This is primarily abstracted from groundwater via boreholes, which are particularly at risk from diffuse pollution from a variety of sources.

Water is not only a crucial commodity for the human population of the Island; it forms a habitat for important components of local biodiversity. The maintenance of high quality water resources is therefore fundamental to the Island. Biodiversity can be affected by over-use of water and by water pollution. In Jersey, over abstraction has affected wetland habitats such as L'Ouaisné Common (a breeding site for the agile frog), Grouville Marsh and St. Ouen's Pond. Pollution of water from overuse of agrochemicals and from domestic sources is affecting amphibian populations throughout the Island. Inappropriate engineering work in watercourse management such as culverting of streams can also affect the wildlife by removing habitat and also by channelling surface water into the sea instead of allowing the water to accumulate and filter back into the local water table. The general lowering of water tables by over-abstraction affects the diversity and composition of species which depend on wet conditions. This can have important effects throughout the food chain, as many invertebrates have larval stages which are dependent upon fresh water, in addition to the rich invertebrate populations which inhabit freshwater habitats for their entire life cycles

3.4.2 Agriculture

In order to sustain economic yields high intensity farming methods are used, which have led to diffuse pollution from agrochemical applications (fertilizers and herbicides). The reducing number of dairy farms and increasing number of cows in each herd has led to some farms having inefficient slurry storage with application methods being used which could have effects on the Island's freshwater (See Releases and Discharges). Water is abstracted for irrigation commonly on the light sandy soils in the parishes of St. Ouen and St. Peter especially on early potatoes.

Vraic, which is mainly serrated and bladder seaweeds (Le Maistre 1976), is used as an organic fertiliser and a source of organic matter. It also suppresses potato cyst nematode (PCN) levels in fields where potatoes are grown as well as having a positive effect on flavour of the Jersey Royal Potato. However, the cost of collection and application is expensive and depends on the prevailing weather conditions for availability which can be uncertain at times. It is estimated that the amount of vraic used is now less than when it was subsidised by the States of Jersey, yet it represents a locally available alternative to inorganic fertilizers.

As well as their usefulness as a fertilizer these seaweeds provide a valuable habitat on the shoreline. Studies carried out in Swansea Bay (Llewellyn, P.J. and Shackley, S.E. (1996)) concluded that "mechanical beach cleaning has a serious deleterious effect on overall strandline-related species diversity and population abundance. It appears to be the only additional physical factor affecting those areas with low biodiversity."

It is important to realise, though, that these studies referred to shores with mainly brown fucoid seaweeds (primarily serrated and bladder wracks), and not the green algae *Ulva lactuca* and other red-brown algae found mainly in St. Aubins Bay. The piles of brown seaweed washed ashore, most often on less intensively used beaches like St. Ouens, La Rocque, and Fauvic do provide important habitat and food for many important species of amphipod (*Talitrus* sp. sand-hoppers) and insects. These in turn provide an important source of nutrition for shorebirds (*e.g.* turnstones, sanderlings and dunlin), migrants (*e.g.* swallows) and residents (*e.g.* rock pipit) and for juvenile fish (*e.g.* bass and mullet).
Large amounts of rapidly decaying sea lettuce and similar species probably produced from increased nitrates and phosphates entering coastal waters are undesirable to all beach users. It does not seem likely that such large anoxic rotting masses provide habitat or a food source for species important in any naturally occurring food chain; hence bulk removal of these algae appears desirable. Unfortunately the sea lettuce is not useful for fertilizer, so disposal creates another problem.

3.4.3 Fisheries

The current licensed commercial fleet consists of approximately 200 vessels engaging in capture fisheries, ranging from large trawlers to small angling vessels. Decapod crustaceans (i.e. lobsters and crabs) form the mainstay of the commercial industry with other molluscs (including scallops and whelks) also being important as well as certain wet fish stocks, including bass, sole, conger and bream.

In addition the fish farm industry utilises 54 hectares of the intertidal zone and 100 hectares subtidally. Main species currently farmed are pacific oysters and mussels. Other species include scallops, clams and ormers raised experimentally. Turbot are the only wetfish species farmed in the Island. The value of the fish farm industry at first sale was approaching £1 million in 2003. Jersey has European Union disease-free status with respect to fish farming and so water quality is extremely important to this industry. It is equally important to ensure that fish farming activities do not have a detrimental effect on environmental quality particularly with respect to visual impact, traffic generation or other disturbance from noise, light or odour pollution. The waste generated by the fisheries industry can lead to disposal problems. For example, the dumping of whelk shells at the end of St. Catherine's Breakwater was halted in 1997 due to the smothering of a site of at least 500 square metres of seabed at the dump site. A thick blanket of up to 80cm of shell and waste organic material effectively rendered the area anoxic and all benthic marine life in these areas was temporarily lost. Over time this material has now dispersed but such events could be repeated without very careful controls and mitigation measures in place.

3.4.4 Mineral aggregates

Four quarries provide sand, gravel and stone for the local construction industry (Figure 24) and in 1999 these local operators had a total output of around 450,000 tonnes, which was supplemented by local recycling and, occasionally, the importation of rock armour and beach replenishment materials.

Figure 24 The four local quarries

Quarry name, site	1999 output	Products	Theoretical life expectancy	Comments
Ronez Quarry, St. John	220 000 tonnes per annum	Stone used widely including for concrete blocks, wrapped products, graded dry aggregates, asphalt and pre-mix concrete.	20/30years	Future needs are to obtain maximum depth abstraction. It will be necessary to extend to the west of the quarry and this would extend its life to 36/51 yrs. The alkali-silica reactivity of stone means it is not suitable for all end uses.
La Saline, St. John	2000/2500 tonnes per annum	Only local quarry producing building stone and some exports to Guernsey	Unknown given present small scale	Could continue under present regime into the short to medium term. There are no plans to expand.
La Gigoulande Quarry, St. Mary	150 000 tonnes per annum	Stone - 50% is loose aggregate and rest is used for pre-cast products, blocks and ready-mix concrete	Few months	Theoretical life expectancy with rezoning of field 961 St. Mary extends lifespan to 13/20 yrs
Simon Sand and Gravel Ltd, St. Ouen's Bay	74 000 tonnes sand per annum	Sand that meets grading specification for general use in mortars but not directly as a fine aggregate in concrete or pavement construction	60 years available resource but limits permit in place until 2018.	Difficulties in extension due to ecological sensitivity of adjacent SSI. Current planning permission is conditional on detailed restoration as dictated by an Environmental Impact Assessment
LE J Moon, St. Ouen's Bay	10 000 tonnes sand per annum	Sand for niche markets. Yellow sand used for concrete products (esp render and brick mortar); inferior black sand for back filling of trenches.	This quarry is now closed	No scope for expansion or plans for the future

Clearly mineral extraction makes a vital and major contribution to the economy of the Island, but there is no doubt that such quarries make a substantial impact on the environment. Potential adverse environmental impacts include damage to the landscape, wildlife, water resources and countryside character. In addition mineral extraction has the potential to generate nuisance for local residents in relation to noise, dust, water pollution, heavy traffic movement and other disturbances including vibration and shock waves from blasting. On our small, densely populated Island these problems are exacerbated. Presently there are clear indications that there will be significant additional pressures to release land for sand working and stone quarrying in the Island in the next 10 - 15 years. The three main mineral operators have all expressed a desire to expand the area of their present operations, either immediately or in the near future.

About 5,000 tonnes of sand are imported per annum by Ronez Ltd. but there is no dedicated handling or storage facilities for aggregates at the harbour and current high port dues and stevedoring charges discourage a greater level of importation.

3.5 Waste

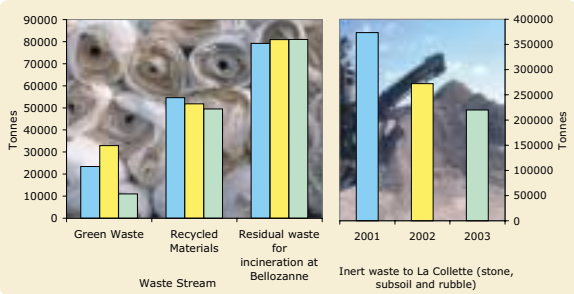


Figure 25 The solid waste arisings in 2001 (blue), 2002 (yellow), and 2003 (green). The 'other' category is comprised of recycled plastic (agricultural film), re-used textiles and recycled timber.
Source: 'Draft Solid Waste Strategy', Environment & Public Services Committee 2004.

A balance must be struck between the community's need for aggregates with the requirement to conserve mineral resources for the future and the need to prevent unacceptable damage to the environment. The Environment and Public Services Committee is responsible for licensing extraction and determining all planning applications for matters relating to such mineral operations.

3.5.1 Sources of waste

Currently Jersey generates about 400,000 tonnes of solid waste each year (Figure 25). Of this, approximately 300,000 tonnes is inert waste produced from the construction and demolition industry and is used to provide stability of the infilling of the La Collette reclamation site. The remaining 100,000 tonnes is largely biodegradable or combustible waste which comes from both household and commercial sources.

An evaluation of local household waste generation undertaken by the Public Services Department indicates that municipal waste for each person is approximately 475 kg per annum. The target set by the EU is 300 kg per person.

A major challenge for most communities is growth in waste production. Jersey is no exception with a typical annual growth in waste arisings of almost 3%. The Island's growing waste stream can be attributed to:

- The availability of more disposable and short-life products due to improvements in materials and manufacturing technology.
- The popularity of convenience foods which are often excessively packaged.
- A tendency to live in smaller family groups. The efficiencies of a large family living in one household are reduced, generating more waste.

The environmental pressures associated with managing waste are often very apparent. Collecting, storing and processing waste consumes natural resources through energy demands and occupies valuable land space. Operations for managing waste can also be a source of nuisance through heavy vehicle movements and the production of noise, dust and odours. Many other countries deal very differently with their waste products compared to Jersey who rely heavily on energy recovery (incineration) (Figure 26).

On a global scale, less sustainable waste management practices such as the landfilling of biodegradable materials have serious implications for the environment such as through the production of methane, which is one of the principal greenhouse gases thought to be contributing to global change.

The existing energy from waste plant in Jersey, which deals with the majority of the biodegradeable waste stream, no longer meets the strict emissions standards set for thermal treatment plants by the EU Waste Incineration Directive. This facility must be decommissioned as soon as possible and replaced with a compliant, state of the art plant.

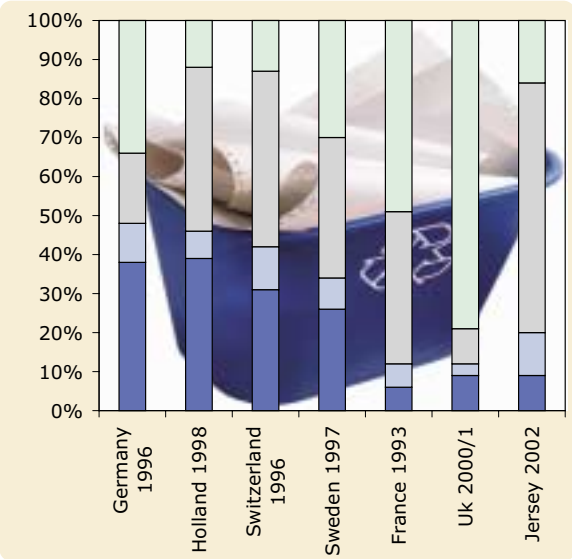


Figure 26 Data from several European Countries comparing data on recycling (dark blue), Composting (light blue), energy recovery (grey) and landfill (green). Note the reliance Jersey places on energy recovery / incineration and landfill with comparably little recycling.
Source: 'Dealing with Jersey's Waste', Environment and Public Services Committee 2004.

3.6 Illegal practices and incidents

3.5.2 Hazardous arisings

Although Jersey is not an industrial society, a significant quantity of hazardous waste arises in the Island each year. Examples include: -

- Pesticide waste from the agricultural industry, amenity areas and from domestic use, consisting of a range of pesticides.
- Assorted laboratory chemicals from schools, hospitals and other laboratories.
- Waste oils, engine cleaners, cellulose thinners and battery acid from the motor trade.
- Miscellaneous paints, resins, solvents, photographic chemicals and cleaning chemicals plus drums washed up onto beaches.
- Nickel-Cadmium (NiCad) and mercury batteries generated by the Public Services battery collection scheme.
- Asbestos waste.
- Local companies *e.g.* Jersey Electricity Company also generate waste of various categories.

3.5.3 The disposal of hazardous waste

There are some facilities for on-Island disposal of certain types of hazardous waste, including clinical waste, incinerator ash and small amounts of contaminated land. However, some hazardous waste has had to be exported to the UK for specialist disposal by high temperature incineration or landfill. The NiCad batteries are sent to France, via the UK, for recycling. Jersey is not a signatory to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposals. Therefore we could not ship waste for disposal to parties to that Convention (All EU member states are parties) without a Memorandum of Understanding (MoU) which has allowed us to export our hazardous waste. However, this MoU expired on December 31st 2002 and was not renewed, so Jersey has been unable to export any hazardous waste from the Island since January 1st 2003. Hazardous waste awaiting disposal has been stockpiled at Bellozanne since that time.

3.6.1 Compliance

The enactment of the Water Pollution (Jersey) Law, 2000 provided the legal mechanism for controlling pollution of the Island's controlled waters and bought the Island into line with the rest of Europe with regard to the protection of the aquatic environment from all forms of pollution. Under this legislation it is an offence to cause or knowingly permit the pollution of controlled waters. The Environmental Protection Section, Environment and Public Services Department investigate approximately 150 incidents annually (Figure 27) which occur in a variety of ways (Figure 28). There have been a number of successful prosecutions although enforcement can be via a variety of routes (Figure 29).

Figure 27 The number of pollution incidents from 1993 to 2004. Up until the introduction of the Water Pollution (Jersey) Law 2000, there was an increasing trend in the number of incidents annually but this trend has reversed since the introduction and enforcement of the Law. **Source:** Environmental Protection, Environment and Public Services Department.

When furze fires occur (usually in the Autumn), often as a result of badly discarded cigarettes or barbeques, large areas of heaths are razed to the ground, altering the future age structure of the gorse and heather and leaving little refuge for surviving animals. The vegetation does ultimately recover but often takes years to do so. Between 1998 and 2000 there were 35 individual furze fires in Jersey covering over 20 hectares of ecologically important land.

Fly tipping, as well as being unsightly and costly to remove, is also a route for the spread of alien and potentially invasive species. Historically, many plant species have escaped the confines of gardens this way, and some have become established in the countryside to the detriment of native species, and on occasion, ecosystems. One such example is the invasion of Japanese Knotweed.

3.6.2 Extreme incidents

Despite forward planning and the best of intentions, some actions have unpredicted outcomes. One such example occurred at the composting operation at the Crabbé site, St. Mary. Compost produced at Crabbé had been made using demolition timber which was found to have been treated with Copper Chromium Arsenate, a timber preservative. A wood-chip mulch from the Crabbé composting site was then used to form a track. Following heavy rainfall in the autumn of 2002, heavy run-off from this site was noticed by workmen working nearby. A subsequent analysis of the run-off revealed high levels of arsenic. As a result of this incident composting using demolition timber was stopped and ultimately the Crabbé site closed, and now green waste composting is carried out at La Collette. Agricultural waste, following the closure of Crabbé, is now disposed of back to agricultural land according to guidelines provided by the Environment Department which ensure that the rate applied does not exceed the allowed annual nitrogen input to land, and is applied in a manner that minimises the risk of pollution.

3.6.3 Illegal fishing

Catches of local stocks of both shell and wet fish, are controlled by legislation derived from the European Union, UK and local sources by either technical measures (*e.g.* minimum landing sizes, minimum net sizes) or effort control (*e.g.* licensing, total allowable catches). Legislation is enforced on all persons inside Jersey's territorial waters, local and foreign, commercial and recreational, on land (low water or landing) and at sea.

Jersey records several dead cetacean strandings annually, and although the local fleet is not implicated, some are considered to be 'by catch' from fishing fleets further up the English Channel. It is estimated that about 10,000 dolphins and porpoises die each year around UK and French coasts, many of them after being caught up in bass nets. More than 300 cetacean carcasses were found on UK beaches in the south-west region in the year 2002-2003. Locally stranded mortalities are sometimes common dolphins that have become entangled in

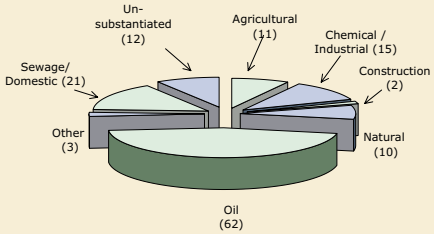
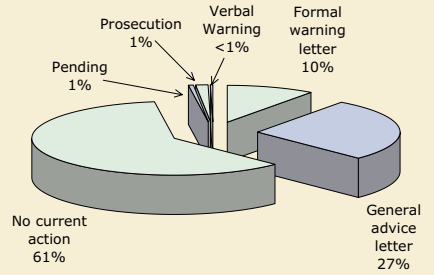


Figure 28 Pollution incidents by type in 2003. Consistent with previous years, oil related incidents cause the majority of pollution.
Source: Environmental Protection, Environment and Public Services Department.

Figure 29 Enforcement actions taken in 2003 - only the most serious cases are recommended for prosecution.
Source: Environmental Protection, Environment and Public Services Department.



fishing nets, commonly from pair trawling operations in the Channel. These animals subsequently drown since they cannot free themselves and reach the surface for air. Jersey contributes strandings data to the UK National Standings Scheme and continues to raise this issue through the forum of the British Irish Council.

4.0 State of the environment

4.0 State of the environment

In this section the condition or state of the environment is examined. Often in order to explain how the condition of a particular parameter is arrived at we need to explore the pressures or threats associated with it.

4.1 Countryside character and key habitat types

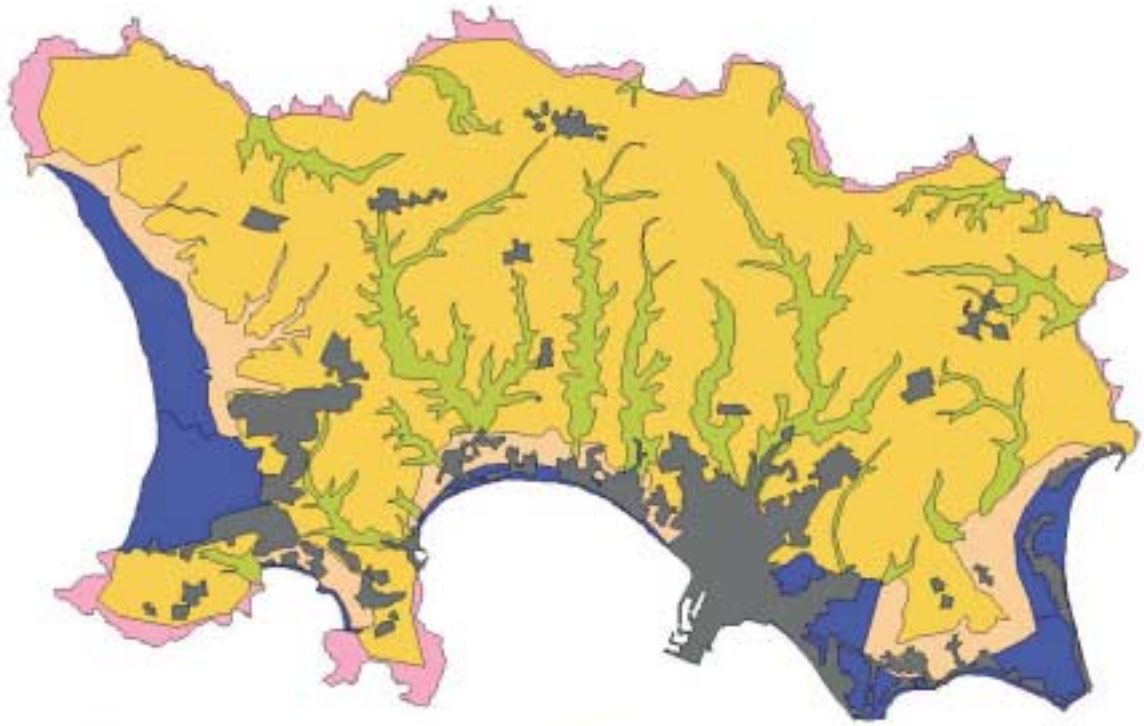
4.1.1 Countryside character features, their importance and the threats facing them

As part of the review of the Jersey Island Plan, a study was carried out in 1998 which aimed to develop an integrated holistic understanding of the Island's character (Jersey Island Plan Review: Countryside Character Appraisal 1999). Following a similar approach to the production by the Countryside Commission and English Nature of the Joint Map of England, the study aimed to provide a sophisticated assessment of the character areas which comprise Jersey's countryside. This was done in order to assist the production of appropriate planning policies and to inform development control decisions, to ensure that the revised Island Plan respected the distinctive character of the Island's countryside and avoided any detrimental effects of development.

To do this, countryside character areas were defined based on landscape and habitat qualities and historic cultural heritage. The forces for change affecting the various character areas having been identified, relative levels of protection and the capacity for development which would not unduly adversely affect the character were established and the countryside protection policy zones were redefined.

The resulting document is an essential pre-requisite for future development planning and policy formulation for the Island which will ensure that the distinctive and varied character of the countryside is respected, protected and enhanced.

Five "Countryside Character Types" were identified in the Appraisal, and the main features, which include the character of each area, the importance of each area and the threats facing them are summarised here.



Cliffs and headlands

This landscape type comprises the geologically important elevated cliffs and headlands that occur on the harder igneous and volcanic rocks, in the south-west, north-west, along the north coast and the low wooded edge to the north-east. As well as being internationally important for their complex geology, the cliffs and headlands provide some of Jersey's most spectacular coastal scenery.

The narrow coastal heathland which extends along the north coast from Les Landes in the north-west to Rozel in the north-east is a key habitat type (Biodiversity - a Strategy for Jersey 2000), as is the south-west heathland complex from Corbiére to Noirmont. Because the southern cliffs are warmer and dryer, the plants that grow there are different from those on the north coast. Historically these areas were very useful,

providing grazing, bracken for bedding and gorse for fuel. These uses also maintained a diversity of habitats for plants and animals, but today the habitat quality is threatened since the still valuable habitats are now only maintained by the effects of wind, sea spray and rabbit grazing.

The main threats today are anthropogenic; built development, associated fencing and inappropriate tree planting fragment and destroy valuable habitat and the sense of peace and wilderness, while "tall" structures like the desalination plant chimney and the transmitter masts together with developments like the holiday complex at Plemont, the shooting range at Crabbé and the model aircraft site at Les Landes all have a cumulative negative impact both visually and aurally.

Jersey's heathland cliffs and headlands contain some of the Island's most important environmental features (biological, geological and archaeological sites) with their importance being recognised at International and European levels. The highest levels of protection are recommended. There is, therefore, no capacity for any form of further development. The only acceptable changes are those arising from positive management regimes designed to conserve and enhance the unique and special character of these areas. Any change such as the creation of new footpath links should be subject to a full environmental assessment, as should any developments adjacent to the character area which could have a visual, aural or other impact on the coastal heathlands.

Coastal plains

The coastal plain character type comprises the flat apron of land which fringes the coastline in the south-east, south and west of the Island The underlying geology is very variable including both igneous rock and Jersey Shales. It is uniformly overlain by thick drift deposits of loess, blown sand, alluvium and peats. The alluvium and peats characterise the areas where the interior valleys wash out onto the plain, while the blown sand generally lies adjacent to the coastal edge. The area contains some of the most important habitats on the Island including freshwater marsh and salt marsh and sand dunes, while a large part of the plains have been built on.

Though once the coastal plains of Jersey were mainly sand dune with marshland behind, as can still be seen in the south-east, much of this land has long since been covered by buildings. Inland from St. Brelade's Bay, St. Aubin's Bay, Gréve d'Azette, St. Clements Bay and Grouville Bay the land is now urban, and only some street names and the soil type survive as indicators of the original landscape.

The three remaining sand dune areas are very vulnerable and are key habitat types as defined by The Biodiversity Strategy (2000). Areas of habitat have been lost to golf courses, residential development and sand quarrying, while factors reducing habitat quality in the remaining areas include anthropogenic pollution, drainage, fire and trampling. Threats to wetland, freshwater marsh and wet meadows include drying out from increased water abstraction, development including changes in water regimes resulting from edge development and pollution from agricultural run-off.

On the coastal plain, the level of protection and capacity to accept further change varies greatly between the individual character areas. The intact, comparatively undeveloped coastal plain of St. Ouen's, for example, deserves the highest level of protection, while more developed areas may have some further capacity.

A more detailed study of existing development edges will be required to determine precise capacity and generate design guidelines. For all areas of coastal plain the key habitats (sand dune and wetland) must be protected from the effects of further development and important 'open gaps' in the coastline retained.

Inland escarpments

The coastal escarpment represents the pre-historic cliff line of Jersey, which has been pushed back by comparatively recent accumulations of drift deposits of blown sand and loess of various thicknesses. The steep topography of the escarpment forms a backdrop to the flat, mostly developed coastal plain and is a very distinctive feature of the Island's landscape. The escarpment includes a considerable area of semi-natural habitats made up of woodland, heathland, scrub and gorse, while on the west facing escarpment of St. Ouen, heathland cover characterises the more exposed knolls - collectively, these areas provide a significant habitat resource, although management is required to realise their potential.

Prominent development along the scarp slope and top has breached the 'natural' skyline and there are opportunities to ameliorate this by planting. Trees, including pine shelterbelts and amenity planting along the scarp slopes and tops are particularly vulnerable and many have been lost or damaged in the storms of 1987 and 1990. Consideration should be given to maintaining and improving these features. The Neolithic and bronze age archaeological sites in this character type have suffered some damage from agriculture.

The escarpment has only limited capacity to accept change and a high level of protection is recommended. The 'open' sweep of the escarpment which provides visual and physical containment to the coastal plain must be conserved. Any new development must be very carefully located in relation to the existing urban areas. Further new development should not occur within open 'undeveloped' areas on the scarp slope and should not impinge on the skyline view.

Enclosed valleys

The deep incised landform of the lower end of the valleys becomes progressively more open towards the valley heads in the interior of the Island. These valleys introduce great variety and diversity into the character of the interior of the Island. All the inland valleys contain open water courses, and many include an interlinked system of wet meadows, some of which are still traditionally managed by summer grazing and provide important habitats. Changes in topography have arisen from development like reservoir construction including both large scale and small farm reservoirs. Some areas in the valley heads have been levelled and drained for agriculture.

Virtually all the Island's broadleaved woodland occurs on the sides of the valleys where the land is too steep to have been cleared for farming. The species composition of the woodland is very variable with Jersey's

woods being characterised by small blocks of single species like oak and sweet chestnut, ash and sycamore growing in close proximity. A wealth of woodland plants flourish in the shade and shelter of the valleys, including many species that are uncommon or rare in the British Isles. The woodlands also support Jersey's population of woodland breeding birds as well as providing refuge and feeding for passage migrants and winter visitors.

The differences in land cover, with open meadows and woodland create an interwoven patchwork of light and shade which, combined with the distinctive topography, forge an intimate and complex character.

Some broadleaved woodland has been lost to development but there has been a slight increase in woodland at edges as some côtils come out of agriculture. There is a danger of decline in habitat quality with impact of Dutch elm disease and increased dominance of sycamore, disturbance from intensive recreational use, road traffic and over-zealous land management, for example around reservoirs. Conversely, habitat quality will be enhanced as 'even-aged' structure created by wartime felling becomes more diverse over time.

Many mill buildings have been lost and there are some inappropriate conversions, nevertheless some good examples have been restored and conserved. Often leats and ponds associated with the old mills have been infilled or become overgrown and their value as landscape features/habitats has been lost

The wet meadows in the valleys may be drying out due to excessive groundwater abstraction and decline in traditional management and intensification of grazing regimes has led to loss of distinctive wetland flora and fauna. Some channelling straightening or culverting of streams along the valleys has damaged the biodiversity of these key local features.

The seclusion, peacefulness and tranquillity of the narrow, winding lanes is threatened by the impact of roads, traffic & development. Road widening, kerbing, erosion damage to roadside banks, verges and walls have had an adverse impact but at the same time the designation of Green Lanes has provided an additional recreation resource and helped to mitigate this damage in some areas.

Interior agricultural land

The enclosed agricultural land is located on the higher exposed land of the central plateau. It embraces all the main hard rock types on the Island, including the Jersey Shale Formation, the granites and the volcanic rocks. The central plateau is characterised by deep drift deposits of loess which create rich soils for farming.
The sheltered environment of this enclosed land has considerable ecological value. The intricate and dense hedgerow network is an important wildlife habitat and farmland birds such as skylark and cirl bunting have, until recently, been common. Intensification in farming practices has had a major impact on the biodiversity of the farmland and within this area the roadside walls, treed hedgerows, verges and banques now provide an important refuge for flora and fauna. A positive change has resulted from the recent increase in forage maize production providing an additional habitat used by migrants for roosting.

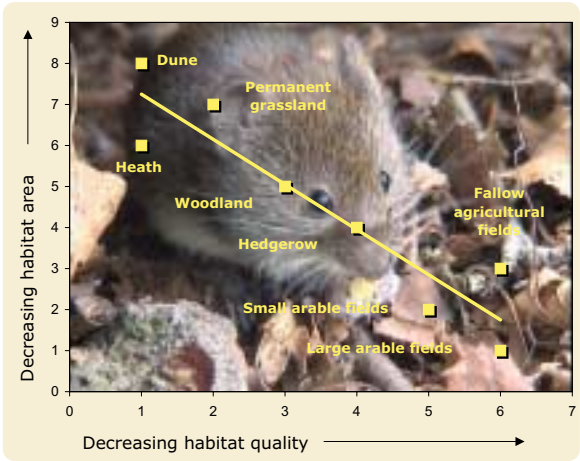


Figure 30 Using small mammal communities as indicators of habitat quality, research showed that the highest quality habitats were the smallest in size
Source: 'The Jersey Mammal Survey', Magris & Gurnell 1998.

Some 250,000 elms were lost to Dutch Elm disease in the 1970s and 1980s and the resultant hedgerow loss, plus severe management regimes have reduced their habitat value. Major planting schemes are starting to repair this loss.

Inappropriate conversions, extensions and replacements of traditional farm buildings have eroded the Jersey 'vernacular'. Substantial new buildings and infilling has disrupted the historic settlement patterns. Building habitat niches, such as roost sites for bats and house martin nests, are being threatened as older buildings/barn are converted.

The key characteristic of the interior agricultural land is the intimate landscape structure created by the mainly small fields bounded by hedges and walls. Although there is some capacity for change, any new development has to be sensitively located and careful attention should be paid to location, scale and design. It is important that any new development respects and enhances local character, and detailed appraisals should be made of capacity. To maintain the gaps and views across the rural hinterland further linear infill development should not occur, and large scale development which has the potential of major impact on the escarpment, dunes and coastal plain of St. Ouens Bay will require a full Environmental Impact Assessment.

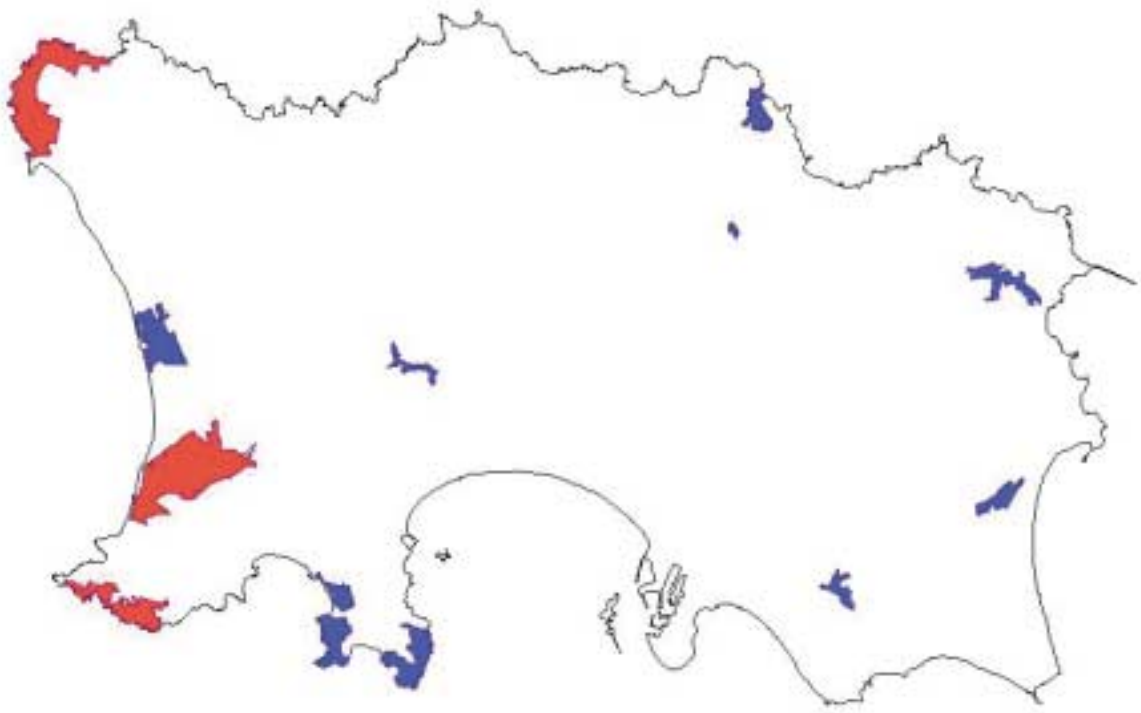
4.1.2 Conservation areas

Legal protection for important natural sites in Jersey is provided under the Planning and Building (Jersey) Law 1964 which gives protection to sites designated as ecological or geological Sites of Special Interest (SSI) using criteria that include diversity, naturalness, fragility, typicalness and potential value. 275 hectares of ecologically important habitats in Jersey are protected with SSI status and 10 additional sites, totalling 210 Hectares, are proposed SSIs of which over half are already managed for nature conservation by the Environment Department and the National Trust for Jersey. These areas, which include wetlands, woodland, maritime heath, sand dunes and grassland are among the most important sites for nature conservation in Jersey. Unfortunately the most valuable sites are often the smallest in area and are at risk from the many threats identified above (Figure 30). However many important species inhabit areas outside these managed and protected areas and therefore remain vulnerable to damage from many different sources, including, for instance, modern methods of management such as the use of flails and herbicide to carry out the branchage of roadside banks and hedgerows.

Three Sites of Special Interest are designated (shown below in red). Designation of the ten remaining proposed Sites of Special Interest (shown below in blue) should begin once the Planning and Building (Jersey) Law 2002 is adopted.

Les Landes

The increase in bracken is the largest current threat to the dwarf shrub heath and grassland vegetation communities on the heathland at Les Landes; over 3 hectares of bracken (c.3% of the site) are being



controlled within the site. Large areas of gorse are in good condition, as they are recovering well from large fires in 2000 and 2001. However there is little age structure, and in 2004, approx 1 hectare (c.1% of the site) of gorse scrub was in management to provide a range of age classes and structure on the site. The molinia bog and associated wet grassland covers an area of nearly one hectare. The grassland areas are reducing in extent due to the lack of cutting or grazing, becoming displaced to dwarf shrub heath, bracken / bramble scrub and ranker grassland.

Les Blanches Banques

Habitats at Les Blanches Banques SSI vary considerably in structure and species composition, providing conditions for a wide range of plants, insects and animals. The grasslands are maintained by exposure and rabbit grazing, but apparent decline of the rabbit population means that grazing is not as reliable an aid for management as it was, leading to habitat change. Areas of young, successional grassland, which are maintained by high grazing pressure, support up to 35 different plant species per square metre. As grazing pressure is reduced and the sward height increases, the diversity of plants declines, and the species composition changes. There are currently no figures available for the size and distribution of the wide variety

of grassland habitats at Les Blanches Banques, but these areas are declining in size and species abundance as other habitats, such as scrub, are increasing.

La Landes du Ouest

Large areas of La Landes du Ouest SSI are severely degraded due to two main issues; habitat change has led to bracken and scrub encroachment over approximately four hectares (c. 10% of the site) of the heathland, and hottentot fig, an introduced species which is naturalised on the south-west cliffs has covered an area of three to four hectares (c. 8% of the site), much of this in inaccessible areas. In addition, fire in the past three years has devastated almost three hectares (c. 7.5%) of the site. However, despite the labour intensive nature of the task, volunteer labour has helped to clear over one hectare of land (c.2.5%) of its 100% fig cover, and at least four hectares (c. 10%) of less dense fig has also either been cleared or is under management. The fire damaged areas are being managed to produce good quality heathland vegetation as they recover, and bracken and scrub management, currently over half a hectare, is programmed to increase over the next three years.

4.1.3 St. Ouen's Bay - a special place

There is a long standing recognition of St. Ouen's Bay as being a 'special place', as the only large coastal open space remaining in the Island. It was formally designated in 1978 and since that time it has been championed by the States of Jersey Les Mielles Sub-Committee (disbanded in 2003) and administered by the Planning & Environment Department. St. Ouen's Bay consists principally of the coastal plain and shoreline, which is contained by the long sweeping line of the fossil sea cliffs to the east. Its attractive landscape is the product of natural influences and management by people. The key components of the natural landscape are Les Blanches Banques dunes, the inter-tidal beach area, the coastal plain and the cliffs. Human occupation has produced small fields with raised boundaries, grazing land, woodlands, farmsteads and small villages. St. Ouen's Bay is valued for its sense of openness and remoteness and as a place for quiet enjoyment. St. Ouen's Bay is subject to processes of change and pressure imposed by human activity. These pressures need to be managed and controlled through the statutory planning process to reconcile conflicts and maintain an appropriate balance of land uses and interests. Among the changes that have most adversely affected the nature conservation interests in St. Ouen's Bay since its designation in 1978 are:-

- extent of sand extraction, with the loss of valuable dune grassland;
- expansion of golf courses, resulting in a loss of dune vegetation, coastal grasslands and gorse habitat and semi natural vegetation;
- car parks on the beach head which have eroded sea edge habitats to bare ground, with loss of important flora;
- loss of a small number of agricultural fields to bracken;
- loss of field boundaries;

Figure 31 The relatively stable number of herring gull nests recorded in St. Helier (blue line), against a declining number of calls of concern re gulls to the Environment Department (yellow line)
Source: Unpublished data, The Environment Department.

4.2 The marine environment

- loss of scrub and trees, due to the 1987 and 1990 gales and salt damage;
- minor losses as a result of new building and horticultural treatment of gardens

4.1.4 Urban areas

Urban areas cover approximately 20% of the Island. There may seem to be no room for wildlife there, but a birds-eye view of St. Helier reveals that there are many small adjacent areas like private back gardens and alleyways as well as public areas ranging in size from Howard Davis Park or Green Street Cemetery to small shrubberies, flowerbeds, grass verges and individual trees where wildlife can thrive. Birds or bats can live in buildings and can move and feed in a group of separate gardens which to them seem like a continuous stretch of habitat.

Good progress has been made in recent years in looking after these places to make them more welcoming for wildlife we want to encourage such as swifts, sparrows and butterflies. However this is a balance and we ensure, by using sensitive control measures, that wildlife we find a nuisance in urban situations like rats, mice and seagulls do not also flourish (Figure 31).

Approximately two thirds of Jersey's population live in the urban and suburban parishes of St. Helier, St. Saviour, St. Brelade and St. Clement and as we have seen in Section 3.2.4, the urban areas in the Island have increased greatly in the last fifty years. This need not mean that wildlife is extinguished in urban areas. By developing our knowledge of urban biodiversity and publicising things that everyone can do to encourage species they like to see, for instance use of properly designed feeding stations, urban areas can make a useful contribution to the overall biodiversity of the Island and increase public understanding and enjoyment of wildlife.

The exceptional marine environment of Jersey is an area of intense activity where complex interactions between physical, biological, social and economic systems are constantly taking place. The intertidal zone in Jersey is of international importance. The overall extent and character of the rocky reefs and intertidal sediment flats is found nowhere else in Europe (Kindleysides 1995). At low tide an extensive and biologically rich area of 3 210 hectares is exposed. The steep rocky coast, granite rocky platform and beach coast comprise the Jersey shoreline and are equally important, although better studied than the subtidal environment of predominately tideswept sands and gravels. Large reef systems surround the Les Écréhous and Paternosters and extensive areas of shallow water with mixed sediment habitats stretch southeast from the Violet Bank. Of special interest is the submerged Plateau des Minquiers, an area of water shallower than 10m covering over 100 square kilometres.

The conflict of interest between anthropogenic uses of the marine and intertidal environment and biodiversity conservation has given rise to a number of issues and threats including:

- reclamation and subsequent development with associated impacts of habitat loss, alteration of coastal processes, diminishing species diversity.
- Extraction of offshore aggregates for use as fill, increased pollution and generalised habitat degradation from activities linked to construction and maintenance such as tipping of spoil, large scale land reclamation, and altering coastal processes;
- Pollution and contamination including nutrient enrichment from treated and untreated sewage effluent and fertiliser run-off, effects of leachate from landfill sites, oil and chemicals etc.
- Coastal defence construction, maintenance or managed retreat particularly in respect of predicted rising sea levels and other possible effects of global warming.
- Over-fishing, general pressures on fish and their food supply and impacts on non-target species;
- Shoreline construction such as marinas;
- Human disturbance on remote reefs and islets;
- Large scale pollution from a shipping incident.
- Lack of baseline data on populations and coastal processes.
- Disposing of the massive production of rubbish has been addressed by filling a large area in St. Aubin's Bay and Havre des Pas, destroying the area with the highest recorded species diversity of all Jersey's coastal compartments (Kindleysides 1995).

The 1987 Island Plan began to address the problems of planning in a marine environment, notably by providing facilities for the fishing industry in the harbour and safeguarding of sites for potential shellfish cultivation.

The Countryside Character Appraisal identifies three primarily coastal character types (Figure 32) which are all key habitats as defined by the report 'Biodiversity: A Strategy for Jersey' (2000) :-

Edges of cliffs adjacent to deep sea

These areas include the north and south-west cliffs; hard igneous uneroded rocks remain upstanding as high cliffs, with a very small intertidal area which is rarely more than 10 metres wide and deep sea beyond. Along the north-east edge the Rozel Conglomerate creates a convoluted rocky shoreline with numerous coves, inlets and rock promontories. Along the north coast there are small bays with distinctive small harbours, granite piers and areas of sandy or shingle shore. The area contains a unique range of habitats including rock platforms and rock pools, supporting distinctive communities of plants and animals adapted to the exposure and large tidal range.

These cliffs are perhaps the most valuable characteristic of the Island; the views of the deep clear sea help reinforce an illusion of space and remoteness, rare qualities in Jersey. Because of the absence of sea walls and other development, the land-sea transition remains wholly natural. Although relatively little is known about the biodiversity and archaeology, indications are that the value is high.

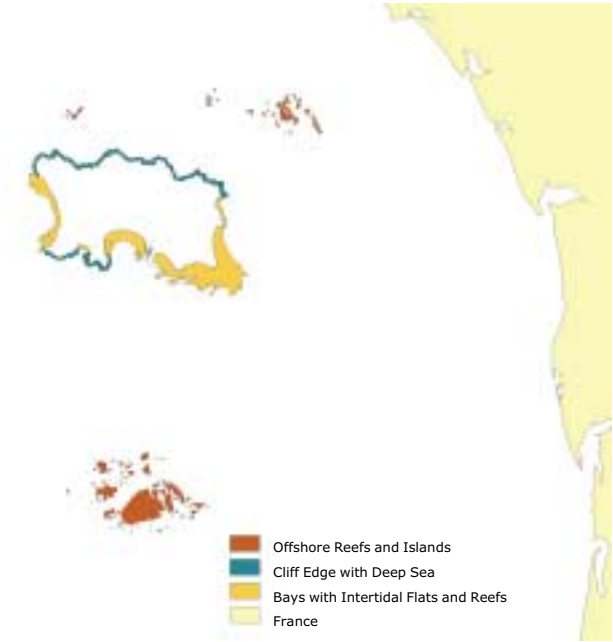


Figure 32 The coastal 'countryside character types'.
Source: 'Jersey Plan Review: Countryside Character Appraisal', States of Jersey 1999.

The capacity for change is therefore low, and the area is part of the marine protection zone. With a presumption against all forms of development, even minor developments such as beach kiosks, navigation aids and signs must be sensitively designed and located. The cliff edges must retain a remote, isolated character.

Bays with inter-tidal flats and reefs

The shallow shoreline gradients and the very large intertidal range that can extend for well over 2 km between mean high water mark and mean low water mark are the main distinguishing features of this intertidal character type. It typically includes sweeping sandy bays such as St. Brelade's Bay and St. Aubin's Bay, plus large areas of intertidal rocks and reefs exposed at St. Ouen's Bay and around the south-east coast. The combination of the large tidal range, shallow shore gradients and presence of intertidal rocks and reefs combine to create a seascape which is unique in Europe and possibly the world.

They support an internationally important population of turnstones and nationally important populations of sanderling, Brent goose, ringed plover and grey plover. At least 8 ,000 waders winter on the shoreline each year feeding on the rich diversity of marine organisms found in the wide range of intertidal habitats. Several of these marine species, like the ormer, are at the northern end of their range so are rare or absent from the British Isles .The extensive shallows provide a productive nursery area for the juvenile stages of many important commercial and non-commercial fish and crustacean.

The Jersey shoreline is identified as an Important Bird Area, with the south-east coast designated a Ramsar site.

Intertidal 'peat' deposits can be identified in a number of areas around Jersey's present coast and these have the potential to yield very important information about past sea level fluctuations and environmental change. Land reclamation is a major threat to this character type; approximately 50 hectares of intertidal land have been reclaimed in the last decade at St. Helier Harbour leading to losses of internationally important, non-recreatable marine habitat of intertidal sediment flats, rocks and reefs. Marine pollution could devastate these areas, and land-based pollution can also have deleterious effects, not least on the economically important shellfish farming in Grouville Bay.

The whole area is defined as a Marine Protection Zone. The south-east coast is a Ramsar area, and most of the rest of this character type should eventually be similarly designated. The bays, with their extensive areas of intertidal flats and reefs, contain a very significant part of the Island's key biodiversity and aesthetic value. It is recommended that they should have the absolute highest level of protection with a presumption against all forms of development.

There is no capacity for change apart from sustainable management of renewable natural resources. Even minor developments such as temporary beach kiosks, navigation aids, signs etc, will need to be sensitively designed and located.

It is recognised that some of the Island's sheltered sandy bays are important for commercial fish farming. Monitoring will be required to ensure that fish farming activities do not have a detrimental effect on environmental quality. It is recommended that any such proposals within the marine zone should be subject to a full Environmental Impact Assessment.

Offshore reefs and islands

Les Écréhous (including Les Dirouilles and Paternosters), and Le Plateau Des Minquiers are composed of ancient rocks which were formed before the principal granite rocks on Jersey. They therefore have high geological importance representing a distinctive and separate geological entity with a different origin to that of the main Island. Planed by the action of the sea over the millennia they are a largely submerged rock plateau with upstanding rocks and peaks projecting above sea level. Some of the larger islets retain a thin soil cover and support vegetation and have, in the past, been inhabited. The shallow gradients of the plateau combined with the massive tidal range means that at low tide a vast area is uncovered which, combined with the intertidal areas around mainland Jersey, effectively doubles the area of the Bailiwick. The solid rock is readily eroded and the submerged landscape includes substantial shingle and sand banks, some of which are only revealed on low spring tides.
The diverse and extensive intertidal habitats (including rock platforms, sand and shingle banks and sheltered shallows) are rich in marine life and play an important role in maintaining the diversity of marine life in the Channel. The huge intertidal areas are particularly attractive to waders and marine mammals; bottle-nosed dolphins and grey seals can frequently be seen.

The distinctive salt-tolerant flora of the islets is threatened by increased disturbance by humans *e.g.* colonies of sandwich terns used to nest on Les Écréhous until human activity disturbed them and this species is now largely absent from the reefs and their nests have not been seen since 1983. Damage and clearance of the vegetation on the islets has reduced the amount of cover available for breeding seabirds and migrant passerines. Recent planting of garden shrubs around the formerly inhabited areas may have a significant effect on the native flora by altering the make-up of the soil and native vegetation.

It is recommended that the whole area of Jersey's offshore reefs should have the absolute highest level of protection with a presumption against any new development. The Islands are included within the Marine Protection Zone and have been approved for designation as Ramsar sites.
The only building work that should be permitted is the sensitive repair and restoration of the existing architectural resource and even this will require strict conditions to ensure that the work does not have an adverse environmental impact (*e.g.* stockpiling of material or ground disturbance).

Capacity for change is limited to appropriate and sensitive management designed to sustain and enhance the environmental character of the offshore reefs and Islands. A policy and code of practice to minimise human impact and disturbance is a priority. It is strongly recommended that further research and survey is undertaken on all environmental aspects to provide a baseline for future monitoring.

4.3 Biodiversity - key biological populations

The States is committed to sustaining the Island's terrestrial and marine environment through the Convention on Biological Diversity framed at the Earth Summit in 1992 in Rio de Janerio. The local response to this important event and the ensuing International Convention - the Convention on Biodiversity, was the production of the document 'Biodiversity: A Strategy for Jersey' in 2000. The causes of loss in biodiversity have been identified by the Biodiversity Strategy as water, energy and climate change, transport, recreation and tourism and land use planning.

4.3.1 Key biological populations

The long timespans characterised by geological, geomorphological and climatic changes have allowed wildlife to adapt without necessarily becoming extinct. Throughout most of human history, changes were also slow enough to allow wildlife to continue to survive. For the last 200 years, however, the acceleration of the changes caused by human activities is outpacing the ability of natural systems to adapt. People are now the major regulators of the biodiversity that still exists. By causing relatively swift changes to the climate, and simultaneously restricting the natural movement of species through development whilst facilitating the introduction of species from other countries through trade and vastly improved transport, people are pushing wildlife to the limits of survival in many areas. It is therefore imperative that existing habitats are preserved and if possible enhanced. Conservation management is necessary to minimise the negative effects of human activities on wildlife and, if possible, restore habitats to functioning systems where needed.

Priority Species

Priority species, or species that were selected for priority attention in Jersey by a consultation process in 1995, were chosen using four criteria. The first was rarity - that is whether the species was included in the British red data book, which is based on IUCN criteria (IUCN 1994) - or was entirely absent from the rest of the British Isles. The second criteria was the species' potential for recovery, in other words that the population should increase if and when habitat conditions improve. The third was that the species should be easily recorded for monitoring purposes, and the fourth that the species had major public appeal. Although there are many other candidates, mainly on grounds of local rarity, the species selected were considered to be good indicators of the health of the key terrestrial habitats in Jersey (Biodiversity - a Strategy for Jersey 2000).

Agile frog *(Rana dalmatina)*

The agile frog is absent from mainland Britain but is widespread in continental Europe, yet locally its numbers have steadily declined locally since the 1980s now being reduced from 7 sites to just one - L'Ouaisné Common is their last breeding site (Figure 33). Habitat loss and fragmentation, an overall decline in groundwater quality, water pollution incidents, water shortages and predation from feral populations such as ducks and competition from introduced exotics such as the common frog are all reasons for the decline of this species. A recovery programme has developed and two approaches have been adopted. A captive breeding programme alongside wetland habitat management attempts to stabilise ex-situ stocks with the aim of re-

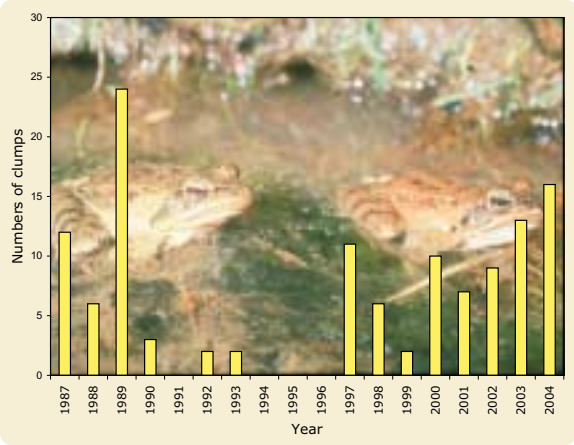


Figure 33 Spawning success measured in clumps of spawn recorded at L'Ouaisné Pond between 1986 and 2004. Note how few and variable are the numbers of clumps, ultimately making the population's survival uncertain.
Source: Unpublished data, The Environment Department & Agile Frog Group.

introductions into existing and potential new sites. These measures, along with the monitoring of water quality, habitat protection measures and education and publicity campaigns, are hoped to restore the agile frog back to favourable conservation status i.e. a self-sustaining population is achieved. Alongside the frog, the 'crapaud' or common toad is an iconic species locally from which the jovial term for local people arises. There are concerns that this formerly very common local species is in major decline for much the same reasons as the agile frog. An intensive study beginning in 2005 will attempt to investigate further.

Cirl bunting *(Emberiza cirlus)*

This is a British Red Data Book species but is relatively common in southern Europe. The decline of the UK population serves to increase the value of the Jersey population which is also in decline due to habitat loss and intensification of its agricultural niche. Monitoring carried out by La Société Jersiaise and reported in the Jersey Bird Report annually recorded the Cirl bunting as a breeding species until 2000, although it has been in decline since 1992 when 19 singing males were located.

Dartford warbler *(Sylvia undata)*

This is also British Red Data Book bird species (put on amber list now). Locally in 1992, 19 singing males were located. In 2003, this number had risen to 46. However its future success relies on the maintenance of suitable heathland habitat. Heathland habitats continue to degrade across the Island due to lack of management, and, as the habitat quality declines, so will the populations of animals and birds that depend upon them.

Blue-winged grasshopper *(Oedipoda caerulescens)*

This invertebrate is common throughout Europe but absent from mainland Britain and is probably at the northern most extent of its range in the Channel Islands. On Jersey it is restricted to a few sites and prefers hot, dry grassland including dunes and some cliffside dwarf heath communities. In one area (St. Ouen's Pond) it is showing evidence of an adaptation to its surroundings, whereby a small subpopulation inhabiting grassland near the sea wall is developing an almost black colouration in response to the dry, black seaweed thrown up over the sea wall (Murray 1998). Threats to it come from the degradation of grassland on some sites and recreational pressures. Conservation efforts need to concentrate on correct habitat management. The management of grassland habitats such as Les Blanches Banques and Ouaisné should ensure the future of this grasshopper, which may also benefit from changing environmental conditions due to climate change.

Jersey orchid *(Orchis laxiflora)*

This plant does not occur in the UK, but it is quite common in southern Europe and is at the northern edge of its range in Jersey. It is a terrestrial orchid, but is dependent upon wet soils, where it grows in grassland, usually managed as meadows, with a summer hay cut and with cattle grazing after the cut. It can grow in abundance in the appropriate habitat, and it is a good indicator of well managed, wet grasslands. It will persist in unmanaged grassland, but any drainage, soil enrichment with fertilisers or ploughing will soon destroy the habitat and the plant will disappear. The Jersey orchid is now only found at 2 sites in Jersey, which is indicative of the poor state of the Island's meadows.

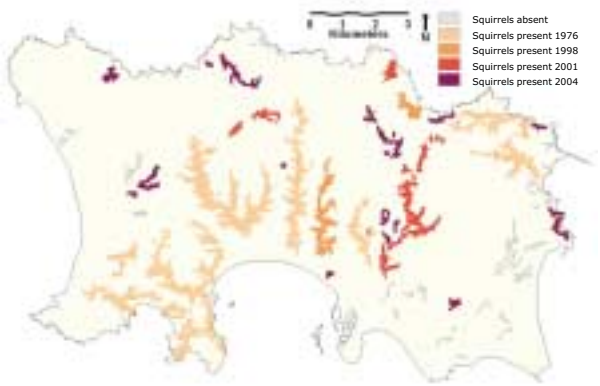


Figure 34 Expansion of squirrel populations in the Island's woods. The different colours represent the year when colonisation was recorded. The woods holding resident squirrel populations have increased by 32% since 1976.
Source: Unpublished data, The Environment Department.

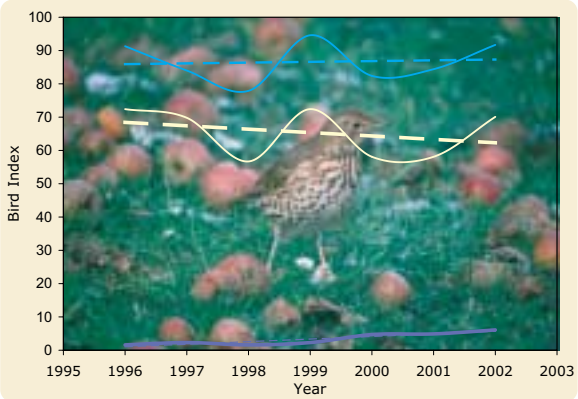


Figure 35 Stable and slightly increasing trend in woodland bird populations (light blue, linear trend line dashed) and the declining farmland bird populations (yellow line, linear trend line dashed) as recorded using the techniques of a national monitoring scheme designed and run by the British Trust for Ornithology to which Jersey contributes. Pheasant populations, although smaller, show an increased trend (dark blue line)
Source: Data collected by La Société Jersiaise Ornithology Section and collated for the Channel Islands by The British Trust For Ornithology

Jersey fern *(Anogramma leptophylla)*

This plant is found at a maximum of eight sites locally. It has an extensive distribution throughout the world but Jersey is the plant's only station in the British Isles. The Jersey fern is one of a only a few ferns in the world, known to have an annual life cycle, and its dependence upon disturbed, but stable habitats, limits its distribution. In Jersey the plant usually grows on road cuttings and dry stone walls - artificial habitats which are managed annually through the branchage. Luckily, the preferred habitat, growing amongst rocks on thin soils, ensures that flails cannot be used close to the soil, and this tiny fern is protected from the ravages of the branchage, unlike some of its roadside companions.

Red squirrel *(Sciurus vulgaris)*

Jersey's is one of the very few populations of this species which does not now live in competition with the introduced grey squirrel. They are a useful indication of the condition and health of woodland quality and connectivity. A detailed population study, completed in 1998, suggested conservation initiatives for the long-term survival of this species. Since then a species recovery programme has led to the planting of 35,000 trees reconnecting the Island's fragmented woodlands through increased hedgerow links and extending the length of the Islands hedgerow network by 10%. This management was steered by the Environment Department and carried out using community involvement. The benefits of connecting and extending the habitat are felt by all wildlife from invertebrates to their predators like insectivorous birds and bat populations. Furthermore, the recreation of the hedgerow habitat has benefits in acting as a physical barrier and reducing soil erosion as well as creating a wildlife corridor through the agricultural interior of the Island. Increased public awareness and the activities of the local community in supplementary feeding of the squirrels have helped to increase the population by approximately 50% from estimated 1998 levels of 400-600 individuals (Figure 34).

More common species

The stoat offers a cautionary tale in local wildlife biology. Stoats were historically relatively common small mammals locally although a survey in 1976 observed that they were slightly in decline (Le Sueur 1976). At that time, reasons for the observed decline could not be attributed and it was not considered significant; Le Sueur says 'the population is still viable and the stoat is not nearing extinction'. Despite this optimistic prognosis, a survey in 2000 (Magris and Gurnell 2000) could not find any evidence of remaining stoat populations and concluded they were probably extinct. Of most concern is the lack of understanding of the mechanisms of their decline. These are hypothesised to be: the vulnerability of stoats to the effects of anti-coagulant poisons used for rodenticide control; a dramatic decline in their prey, rabbits, as a result of myxamotosis; habitat loss and fragmentation and the spread of the feral ferret into the wild. It is of great concern that a relatively common higher mammal could become extinct locally in the last 40 years and without firm explanations as to the cause.

The distribution, abundance and changes over time in the populations of more common species are equally important in telling us about the state of our environment since animal communities are good indicators of the condition of the habitat itself. Common bird species and of butterfly populations are widely accepted as valuable indicator species.

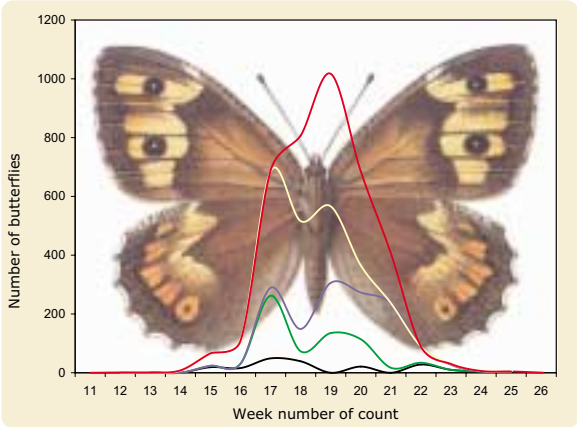


Figure 36 Counts of grayling butterflies in 1991 (red line), 1992 (yellow line), 1993 (blue line), 1994 (green line) and 2004 (black line). Data was collected using the techniques of the Butterfly Monitoring Scheme a national monitoring scheme run by Butterfly Conservation UK to which Jersey contributes.
Source: Unpublished data, La Société Jersiaise 1991-1994 and The Environment Department, 2004.

A study by BirdLife International (Birdlife 2004) points to a steep decline in the diversity of Europe's bird population, with 43% of species in decline as a result of intensive agricultural methods and alterations in habitat brought on by climate change. Using the available information from the Channel Islands (of which the majority comes from Jersey) we see that the yearly population variations between woodland and farmland birds are broadly similar but, whilst woodland bird populations are fairly stable, farmland bird populations are lower and in slight decline (Figure 35). Conversely populations of pheasants, an introduced but now naturalised species, are increasing probably due to the lack of ground predators on the Island.

Populations of many, once common butterfly species are declining rapidly in the UK and we see a similar trend locally. Data in the mid-1990s shows very healthy populations at Les Landes but the 2004 populations are considerably lower (Figure 36). It is only with time and further monitoring that we will know if this is a continuing trend.

Occasionally, direct species recovery programmes can be implemented. Most management however, is centred on habitat conservation with, perhaps, short-term measures to help whilst habitat recovery is underway. It is essential however that the long-term goal is to restore a self-sustaining population as a result of a healthy and complete ecosystem. An example of this would be the barn owl whose breeding success appeared to be nest-site limited due to the number of Dutch Elm Trees lost to disease in the hedgerows and the loss of traditional nest sites in barns. Erecting nest boxes has seen numbers of this nocturnal predator rise dramatically supported by the abundant communities of small mammals (Figure 37). In the long-term as replanted hedgerows mature it is hoped that owls will use natural sites once again.

Habitat management of publicly owned land is carried out by the States of Jersey Environment and Public Services Committee. Non-governmental bodies with land management responsibilities are The National Trust for Jersey who is the largest private land owner caring for approximately 180 hectares of land, 16 historic buildings and a number of lavoirs and pumps as well as organisations like the Men of the Trees who concentrate on woodland management.

Not only are biological populations key indicators for habitat health but they can often highlight changes in the environment. Phenology is the study of the times of recurring natural phenomena especially in relation to climate. Therefore it can measure the way in which our climate is changing. The 20th century has seen a steady increase in temperature with the 1990s being the warmest decade on record. The mean temperature for January-March in the 1960s was 4.2°C compared to 5.6°C in the 1990s. The mean temperature in the spring 1999 was 6.1°C. October 2001 was the warmest October on record with the average temperature for the month 3°C higher than usual. The global surface temperature for 2002 was the second highest on record, and 2002 in the UK was the fourth warmest year on record. Bud burst, spawning times, the behaviour of migrating birds and butterflies all exhibit phenological responses and can provide evidence of climate change. It is thanks to the diligent and long-term consistent efforts of recorders that we can study these changes.

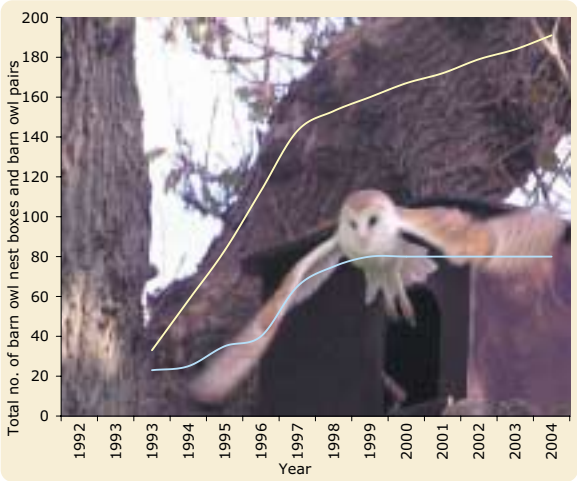


Figure 37 The number of barn owls (yellow line) increasing in tandem with the number of nest boxes erected (blue line).
Source: Unpublished data, Hawk and Owl Trust Jersey Branch 2004.

4.4 Resources

4.3.2 Fisheries

In recent years the local fleet has concentrated on harvesting crustacean and mollusc shellfish stocks: lobster, brown crab, spider crab, scallops and whelks. It is vital from a fishery and an ecological point of view that the health of these stocks is monitored and to this end fishers are required to supply statistics detailing catches and levels of effort. The data supplied is verified by independent stock assessments. These studies, carried out annually, assess the state of a stock using a technique known as catch per unit effort assessment (CPUE). In these trials all variables are minimised as much as is possible to enable changes in stock density to be seen. Currently annual lobster and whelk CPUE assessments are undertaken. The whelk population, whilst being susceptible to fishing pressure given certain biological characteristics, is currently in reasonable state. At present, there is a strong market in France for whelks with approximately 6,000 tons per annum passing through the port of Granville, although Jersey effort is low. In light of the French effort, together with the potential for an increase in local landings, continued monitoring of this stock is vital. All data on lobster stocks has indicated that the population is capable of withstanding current fishing pressure. However, should effort increase, management measures may be required to protect over-exploitation of the population.

Certain habitats are also critical for some life stages of various species. One such key habitat is the seagrass (eel grass) beds which provide a nursery area for a number of important commercial species together with a habitat for many non-commercial species for entire life cycles. The seagrass beds, which exist mainly to the south and east of the Island, have recently been extensively mapped and studied giving a detailed understanding of the ecology of this unique habitat and a thorough management strategy for the future (Jackson 2003)

4.4.1 Land contamination

It is not known in detail how much of Jersey's land may be affected by contamination, though a preliminary estimate has been made. This first estimate drew up 72 sites across the Island categorised in the following way: contaminated; contaminated and remediated; potentially contaminated. The total extent of land included within this preliminary register is 137 hectares. This is 1.13% of the Island's land area above the High Water Mark. However, international experience suggests that only a small proportion of potentially affected sites pose an immediate threat to human health and the environment. Two local examples are Beauport Bay and The Airport Fire Training Ground Sites:-

Beauport Bay

In July 1992 the then Department of Agriculture & Fisheries dumped 4000 tonnes of surplus potatoes in a field overlooking Beauport Bay. Due to ground conditions, burial on the site was carried out in a random manner wherever sufficient depth could be achieved; no records were kept. Leachate from the potatoes broke out in a small spring almost immediately, severely polluting the spring and a small stream leading to the Beauport Bay

tourist beach. A report was commissioned in 1993 leading to the current engineering solution, which involves channelling the leachate to a catchpit, pumping it back up to a holding tank, which is then emptied by tanker. Further incidents occurred in 2001/02 following bouts of heavy rainfall, resulting in additional works to prevent excess water entering the catch pit. Whilst the concentration of the leachate is reducing over time; it is predicted to require another 20 years before concentrations are of a low enough level to go directly to the stream.

The Airport Fire Training Ground

The Fire Training Ground (FTG) at Jersey Airport has been used for approximately 40 years to train airport fire crews. Waste oil products were collected from local businesses and used as fuel for a number of fires set in a tray on the site. Extinguishing these fires resulted in the dispersion of oil over the site surface. During the 1980's the use of foams was introduced for fire fighting training and in 1991 a training rig (fuelled by oil), replaced the former tray. Monitoring of the boreholes and surface water bodies "downstream" of the FTG identified the presence of foam constituents in the groundwater. The foams were found to contain fluorosurfactants, which are not readily biodegradable, contain persistent residues and are potentially harmful. Under the Water Pollution (Jersey) Law 2000 the Airport was obliged to take action to prevent further movement of the fluorosurfactants and hydrocarbons to groundwater and remediate the FTG.

A full investigation was carried out in 2002, including an Environmental Impact Assessment, resulting in the full remediation of the area through a combination of excavation, encapsulation, capping and isolation of the site and the re-development of the FTG to a state-of-the-art fire training facility.

4.4.2 Soils

Soil erosion by water and wind affects both agriculture and the natural environment, and is currently a serious environmental problem. Most local soils are derived from the extensive glacial drift deposits and it is only some of the steepest valley slopes that the soil is derived from the underlying solid rocks making them shallow and acidic. Nevertheless these soils warm up quickly in springtime providing the earliest land for potatoes. By comparison drift deposit soils are deep, generally well drained but moisture retentive, silty or fine sandy loams are very fertile making them attractive for agriculture. However they are weakly structured and are liable to erosion unless carefully managed and protected by the network of shelterbelts and hedgerows.

The physical effect of soil erosion from fields is easy to see, especially from the steeply sloping cotils, along with mud slides and collapsing banks. However, the hidden risk of this erosion is the loss of highly fertile soils which can go on to pollute watercourses. We have seen that nitrates are commonly added to soils as fertilizers and they are very soluble and so can easily travel through the soil and ultimately leach into groundwater and watercourses.

Conversely the majority of phosphorus added to soil is relatively insoluble and losses from agriculture tend to be associated with the loss of soil particles. This can occur by soil erosion through water or wind erosion or the loss of very small particles in drainage waters. Most watercourses have low concentrations of phosphorous and it is the limiting nutrient in fresh water. When the levels of either of these nutrients are out of balance, problems arise and eutrophication can occur. Eutrophication is an enrichment of water by nitrogen and/or phosphate causing algae and higher forms of plant life to grow too fast, disturbing the balance of the organisms present in the water and affecting water quality. Ultimately waters can become deoxygenated causing the death of fish and other aquatic organisms.

Whilst phosphates are present in fertilizers, they can also arise from wastewater rich in the soluble polyphosphates used in detergents. This could be particularly relevant locally where many homes are not on the mains drains system and water is disposed of through private soakaways instead.

Soil quality is extremely important if farmers are to have the option to shift into 'organic farming methods'. With one notable exception the major move into organics started in the Spring of 1998 following preliminary reports into organic production in 1996 and 1997. Areas of organic production were first recorded in the Agricultural Statistics in 2003 when 52 hectares of crops were recorded as being grown to the strict Soil Association Standards with a further 12 hectares in conversion. A more recent survey (2004) indicates that Jersey now has 66 hectares of land registered as organic with a further 7 hectares in conversion. This will give a total of 73 hectares of arable land registered as organic or 1.3% of the farmed area. Most farms will first need to go through a two year conversion period where the land is managed organically (*i.e.* without the use of artificial fertilizers or pesticides), but crops and livestock may not be marketed as organic during this time. Therefore, considerable efforts must be put into a conversion programme and economic returns must be considered carefully before conversion. The Jersey Organic Milk Scheme was initiated in April 1999 whereby contracts were signed between the then Agriculture and Fisheries Committee, Jersey Milk and four individual dairy farmers. The dairy farmers were contracted to convert their land, dairy cows and youngstock to organic production over a two year 12 week period. Governmental funds compensated the dairy farmers for their loss of income during the conversion process and Jersey Milk agreed to pay a premium for supplies of organic milk for a five year period which started on 1st July 2001. In November 2004 there were three dairy farmers producing organic milk under this scheme with approximately 200 organic dairy cows and an area of 122 hectares of fully organic land with a further 10 hectares under conversion.

4.4.3 Waste - landfill sites

Waste by definition represents a misuse of resources. Natural systems tend to operate in 'closed' loops with any waste quickly becoming a resource in another process. Many artificial systems associated with human activities are not closed and generate unwanted materials which in many countries are simply buried. In this respect, waste not managed effectively places numerous demands on the natural environment through the

consumption of finite material and energy resources, land space, and in the production of harmful emissions such as gases associated with global climate change.
Fortunately the large scale landfill of biodegradable waste ceased decades ago in Jersey but inert waste has, for many years, been used as fill for a series of projects to reclaim land from the sea, the latest being the La Collette Phase Two site which is expected to be completed by 2015. Although providing the benefits of expanding available land for development and providing a waste disposal facility, land reclamation from the sea results in the loss of areas of ecologically highly valued marine habitat and may have less predictable impacts such as on tidal flows and sedimentation patterns around the coastline. Other undesirable options for waste management include exporting waste, but this would probably be prohibitively expensive and against the principles of proximity and sustainability. Disposal of waste at sea is not an option either since it would be against the Convention on the Protection of the North Sea and North East Atlantic (OSPAR Convention) to which Jersey is a signatory. One possible option is the use of La Gigoulande quarry for landfill once quarrying is exhausted and with the ultimate aim of full restoration post dumping.

Currently around 35 hectares of land space are utilised by municipal waste management facilities in Jersey but improving the way we manage waste will inevitably lead to demands for more land space. Improving the collection, storage, recycling and other treatment will all require further suitable space.

Reconciling the need for land and managing waste with the associated pressures on the environment is a big challenge for Jersey in the future and it is vital these decisions are tackled as soon as possible.

4.4.4 Water resources

The Island's water resources include all surface waters and groundwater, much of which are used to meet Jersey's water demands. The British Geological Survey has undertaken considerable research into the Island's water resources and produced annual reports since 1989. One of the conclusions is that groundwater should be viewed as a finite, precious resource that is vulnerable to over-exploitation and pollution from a variety of sources. All the fresh water resources in Jersey are derived from rainfall falling onto the Island. Although some believe that underground water flows to the Island from France, this is no scientific evidence to support this theory.

Jersey Water obtains the vast majority of its public supply from surface water sources (approx. 97%). These supplies are augmented by boreholes in the St. Ouen's sand aquifer. In addition, at times it is necessary to use the desalination plant at La Rosiere to produce fresh water from seawater to meet the Island's water requirements. This works on the principle of reverse osmosis, which is more energy efficient and has a reduced start-up time than the technology previously used.

Environmental Protection monitors the quantity and quality of borehole water at various sites around the Island. Because of the complex geology of Jersey boreholes across the Island vary greatly in depth and yield.

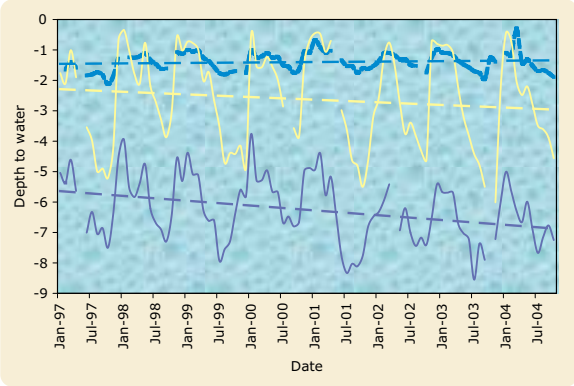


Figure 38 Borehole water levels in three wells, one in St. Martin (19.5m deep, royal blue line, stable trend line dashed), one in St. John (7.08m deep, yellow line, declined trend line dashed) and one at Trinity (11.7m deep, navy blue line, trend line dashed). Key issues in Jersey are the complexity of the Island's aquifer and potentially declining effective rainfall. The overall water body is replenished by rainfall as shown by the early spring peaks in groundwater levels.
Source: Unpublished Data, Environmental Protection Unit, The Environment Department.

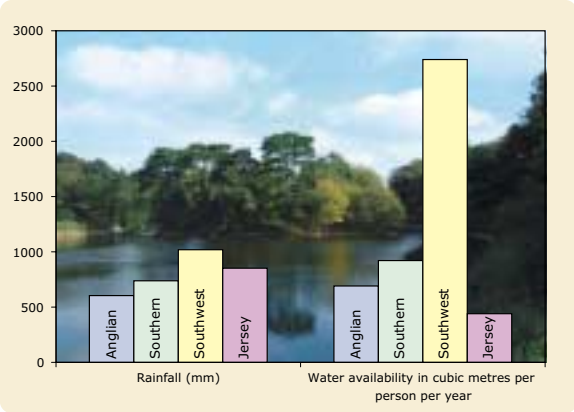


Figure 39 A comparison between rainfall (mm) and gross available water per head of population measured in cubic metres per person per year for three relevant regions of the UK and Jersey.
Source: 'Water Resources for the Future 2001', The Environment Agency.

Depending on the geology, height above sea level and water usage, borehole water levels vary on a seasonal basis and over time (Figure 38). Early in the year, borehole water levels are at their highest due to being re-charged by winter rainfall and are at their lowest in the autumn.

At present there are no controls on water abstractions and water conservation measures are only introduced in drought conditions. Most developed countries have legislation in place to manage water resources. Work is needed to raise public awareness on water abstraction to emphasise that sustainable use of fresh water requires that it be treated as a valuable and finite natural resource. Localised drying up of boreholes and wells could escalate through resource depletion. This could also lead to increased saline intrusion in certain areas of the Island. The total number of dwellings connected to mains water increased by 11% and the mains water consumption by 4% over the five years to 2001. In 2001 there were 32,600 dwelling units connected to the mains water supply. They were supplied with 7,300 million litres of water. Per capita demand for water continues to rise at approximately 1% per annum.

A widely used measure to give the gross average amount of water available to meet all needs can be calculated as:-

(Rainfall - Evapotranspiration) x Catchment Area / Population

Jersey Water has calculated this figure as 440 m^3/person/year for Jersey. As a result of the high population density and small surface area, the amount of available water is low when compared to relevant equivalent areas of the UK (Figure 39).

Evans (2004) points out that there are other factors which may exacerbate Jersey's water resource position, for example:-

- Seasonal variations (especially evapotranspiration) cause much water to be lost to the sea as run-off;
- Year on year variations can drastically reduce effective rainfall; rainfall in drought years is much lower than the average;
- Much rainfall around the coasts is lost as small flows to sea which cannot be economically tapped. Jersey's effective catchment area is therefore significantly less than it's total geographic area (This effect is proportionally greater the smaller the island);
- The remaining resource has to meet all the water needs, both of people and of the aquatic environment (including flora and fauna). In some parts of England and Wales the allocation of water to the environment is the largest 'single' user.
- The larger the 'region' the more scope there is for neighbouring areas to help each other out. Water transfer systems in England are highly developed. However if a drought occurs in Jersey there is nowhere else to turn other than perhaps expensive desalination.
- Holiday populations.

4.5 Compliance with environmental standards and targets

4.4.5 Sea defences

The Environment and Public Services Department plays an important role in maintaining the coastal defences of the Island. Jersey has 25km of sea walls and promenades which are exposed to some of the highest tides in the world - occasionally up to forty foot displacements are recorded. A combination of tide and harsh weather is continuously testing the walls that keep the sea at bay around Jersey. This constant battering of the Island's sea defences demands continual vigilance on the part of the Public Service Department Coastal Defence section. German anti-tank walls act as local sea defences in many places around the Island's shores. However, these walls were not engineered for the task and many need expensive repair works to keep them structurally safe and useful.

The power of the sea is enormous and common problems include the undermining of the foundations or the washing out of old concrete pointing. Even the landward side is vulnerable in harsh weather when soil can be scoured from behind sea walls causing subsidence and, in extreme cases the wall itself may collapse. A severe storm lasting just 24 hours can result in six months work repairing the resulting damage. With predicted sea level rises and an increase in storm surges the necessity for these repairs can only increase.

The effects on biodiversity of the sea walls can be seen in the sand dune systems of Les Blanches Banques and Ouaisné Bay where the flow of inblown sand from the beaches is stemmed and the natural dune habitat behind is changed. In some places new niches have been created but overall the threats to the fragile dune ecosystems have been severe and need careful management to prevent the loss of these fragile and disrupted ecosystems through the stabilising effects of the protection they are now afforded.

4.5.1 Air

There is no air pollution legislation in Jersey although the States have agreed to work towards the limits set out in EU directives that deal with particulates, sulphur dioxide, nitrogen dioxide and lead by setting limits or target values for concentrations in ambient air. In addition to striving to meet EU legislation on air quality the States of Jersey has international obligations to reduce greenhouse gases under the UN Climate Change Convention and the Convention on long-range transboundary air pollution

Air quality in Jersey is generally of a high standard although in certain areas of St. Helier, European standards are exceeded for some key pollutants. Nitrogen dioxide pollution hot-spots have been recorded at Georgetown in St. Saviour, Beaumont in St. Peter and in St. Helier - First Tower, the Bus Stations, Broad Street and La Pouquelaye. Elevated levels have also been found at other sites including Le Bas Centre, Mont Felard, Robin Place, Savile Street / Rouge Bouillon and Beresford Street. A particular air quality black-spot is the Tunnel which has "poor" air quality at certain times. This would be made safer for all users by introducing forced ventilation. Measurements indicate that the European limit value, which has been set for the

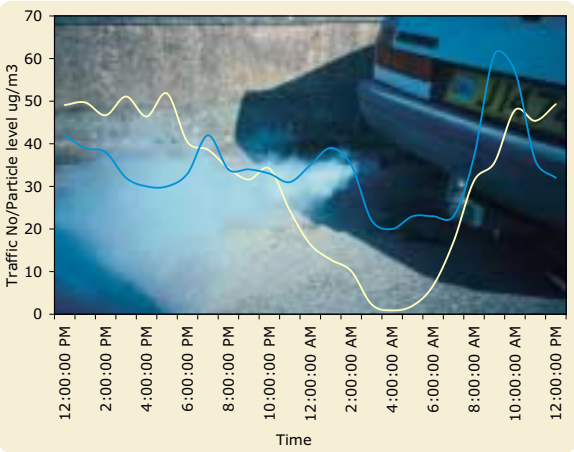


Figure 40 An assessment of levels of the hourly level of particles (PM_{10} and $PM_{2.5}$) (blue line) in Halkett Place, St. Helier, Jersey compared to traffic volume /10 (yellow line).
Source: 'Jersey's Air Quality reports 1998 - 2003', Health Protection Unit, Health and Social Services Department.

protection of human health, is currently being exceeded at some of these sites. Monitoring carried out by the Health Protection Unit has shown than annual mean NO_2 concentrations at all urban, residential and rural background sites were in most cases well below the EC limit value but slightly above the 2002 levels; a trend observed across the UK. Some kerbside and roadside locations remain 'borderline' with respect to UK levels and show no evidence of a downward trend. Further work using more accurate equipment needs to be carried out to ensure compliance with Objectives and Directives and for determining policy.

The Health Protection Unit has monitored air quality since 1994 and with reference to small particles (PM_{10}s) in a period of eight months in 2003 results from the Weighbridge show that there were 20 occasions when the EC and UK Air Quality Objectives were exceeded. These objectives should be complied with by 2010 in the UK and only allow seven exceedances per year. Comparisons with the 2002 data show there were the same number of exceedances (i.e. 20) for seven months of data in 2002 compared to eight months of data in 2003. However when the results are compared against the Air Pollution Bandings it is apparent that air quality was worse in 2003 with five days of high air pollution and three days of very high pollution.

Although it has not been possible to monitor traffic at the site, observations on site suggest that particle levels increase substantially with larger vehicles (Figure 40). Particle measurements at other sites are generally lower than at the Weighbridge and PM_{10} concentrations in Jersey were generally higher than the UK comparison sites but are broadly similar to those found in London and Bristol. Particle levels from other sources such as the power station have reduced since the introduction of two cable links to France i.e. up to the end of September 2003, 97% of electricity used in Jersey originated from France.

Monitoring has shown lead and sulphur dioxide concentrations are well below permitted levels and show a steady decline and are not considered priorities.

The municipal waste incinerator at Bellozanne Valley is at the end of its design life and does not comply with EC Directive limits. It is set for replacement over the next five years with a new facility meeting the latest high standards which will be enforced throughout Europe by the end of 2005.

The physical impacts of vehicles on many relatively narrow roads and the increasing need for car parking as well as the impact of traffic on pedestrians should not be ignored. Furthermore congestion is also a cost to the Island's economy and an indicator that it is functioning inefficiently. It is not easy to calculate but a conservative estimate of the cost of traffic delays is in excess of £20 million per annum in lost worker time.

The health of the general population could also gain from the adoption of sustainable transport policies that reduce the dependence on the car since walking and cycling benefit health.

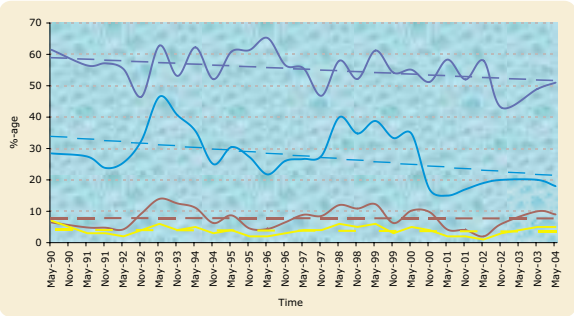


Figure 41 Percentage of water samples with nitrates less than 50mg/l (dark blue line, decreasing trend line dashed); between 51-100 mg/l (light blue line, decreasing trend line dashed), between 101 - 150 mg/l (maroon line, stable trend line dashed) and more than 150mg/l (yellow line, stable trend line dashed)
Source: Environmental Protection Unit, The Environment Department.

4.5.2 Fresh water

Concern has been expressed about the safety of the mains water supply in Jersey with particular reference to the levels of nitrates. The level of nitrates will vary with the source (*i.e.* mains water or private supply *e.g.* borehole or well etc). Jersey Water dilute drinking water with water from various sources Island wide to reduce the nitrate levels.

The acceptability of nitrate concentrations in drinking water is measured against the standard set out in a European Council Directive, with 50 milligrams per litre (mg/l) being the recommended maximum concentration. If the nitrate concentration in mains water exceeds 50 mg/l and is between 50 - 100 mg/l consumers will be advised by the media and despite no evidence of ill health effects being recorded, using the precautionary principle, the Health Protection Unit recommends that bottled water is used in instances when levels do exceed 50 mg/l.

Given that Jersey Water has no control over catchment areas and the diffuse nitrate pollution, The Environment and Public Services Committee has agreed a dispensation for nitrate and a Memorandum of Understanding on water quality has been reached between Jersey Water and the regulator. This allows a derogation level of 33% of samples for nitrate being above 50 mg/l up to a maximum of 70mg/l. The annual reports for Jersey Water show that in 2002, a very wet year, 29% of samples for nitrates and 12% for nitrites exceeded the maximum concentration prescribed by the EU. Yet in 2003 the Jersey Water reported that 99.7% of treated water supplied by Jersey Water complied with the UK and EU water quality regulations.

Routine testing of local waters since 1998 has indicated short-term variations in several supplies. Health Protection recommended that those on borehole or well connect to mains water to prevent possible contamination. More than 50% of private boreholes sampled by the Water Resources Section over 10 years have exceeded the recommended concentration of 50mg/l for nitrate (Figure 41). Nevertheless, the amounts of samples in all the categories exceeding the recommended levels are decreasing, suggesting an overall improvement in water quality since 1990.

4.5.3 Marine water quality

Discharges to bathing waters from terrestrial sources were discussed in section 3.3 and in general the quality of local bathing waters is very good. However samples do not always pass the most stringent tests, mainly because the outfalls are fed by surface water that is subject to bacterial loading arising from the surface water catchment.

Analysis of rainfall data shows that heavy bacterial loading follows rainfall events since, during periods of high rainfall, runoff from land contributes to the overall bacterial loading of the receiving waters. Of further

concern are the effects of nutrient enriched waters on the marine environment - an example would be in St. Aubin's Bay whereby nitrate-rich run-off water is believed to be responsible for seaweed blooms in the bay, impacting on the quality of the environment for beach users. The Environment and Public Services Committee relocates an estimated 3 000 tonnes of sea lettuce annually, down shore, to be removed by the tide at the cost of many thousands of pounds. Whilst the smell that this seaweed produces when it rots after being deposited on the beach is very unpleasant, its removal will have an impact on the invertebrates that feed there, again the reduction of this food source will have impacts higher up the food chain.

Because the incineration of refuse reduces waste volume by approximately 90% it is considered a convenient method of waste management. However, disadvantages include the associated gaseous emissions from the flue and also safe disposal of the solid residue remaining after incineration. This residue is comprised of 80-90% bottom ash from the furnace bottom and the remainder of the fly ash from the dust collection system and it is not uncommon for these by-products to be disposed of by landfilling. However, more recently concerns have been raised by the potential hazards posed by leachate from these sites which could contain heavy metals such as cadmium, mercury and lead that are known to be toxic at relatively low concentrations. The reclamation site at La Collette was used as destination for the ash from the incinerator and we are now conscious of the possibility of leachate entering the marine environment. If this occurred locally it would constitute a breach of the Dumping at Sea Law Sea Fisheries (Miscellaneous Provisions) 1974. This has led to the ash being dumped since 1987 above mean high water level at the reclamation sites. If leachate was to enter marine waters it is likely that metals would be concentrated up the food chain and, in extreme cases, potential public health risks arise because of the ingestion of contaminated seafood (*e.g.* bivalves). A monitoring programme has sampled the common limpet and brown fucoid seaweed since 1994 at seven locations (*i.e.* West of Albert, La Collette, St. Aubin, Corbiere, Gorey, Havre des Pas and Les Écréhous). Comparison of the Jersey survey results in 1995 with samples collected at various sites elsewhere indicate that the levels of the heavy metals under study have caused no significant contamination of local biota. This appeared to confirm that there is no public health risk from heavy metal accumulation in marine biota and the risk to marine life, if any, is extremely small. More recent reports have failed to find discernable trends but as yet are awaiting more robust analysis.

4.5.4 Radioactivity in the environment

Background sources of naturally occurring ionising radiation are by far the bulk of exposure that people may encounter on the Island. Radon is a naturally occurring radioactive colourless and odourless gas formed by the decay of radioactive uranium which is found globally in small quantities. An Island wide radioactivity monitoring network often records slightly elevated levels of Radon after long periods of stable high pressure weather systems when the gas can be retained in the local atmosphere and then is 'washed out' in subsequent rainfall. Despite these occasional elevated levels the actual levels of radon are still tiny (under 120 nano greys) and this is a natural level our bodies are well able to cope with these being less than 1% of the annual limit.

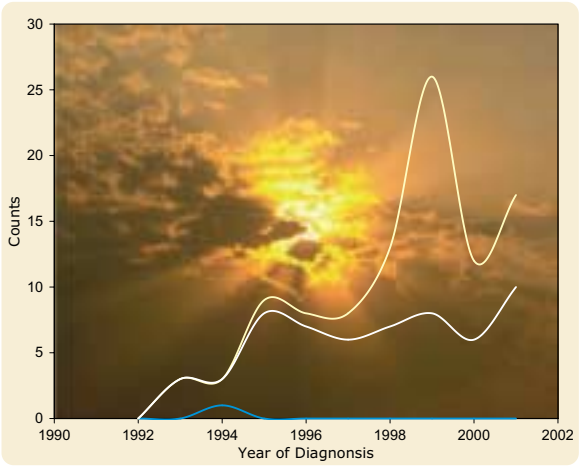


Figure 42 The number of malignant melanomas diagnosed in the 20-64 age bracket (yellow line), the 65+ bracket (white line) and the 0-19 bracket (blue line).
Source: 'Channel Islands Cancer Registration Report 2003' South-west Cancer Intelligence Service.

An independent check on the effects of discharges made by users of radioactive materials in the United Kingdom is made by The Centre for Environment, Fisheries and Aquaculture Science (CEFAS) to ensure that any radioactivity present in food and the environment does not compromise public health. The results of these monitoring programmes, to which Jersey contributes, demonstrate that in 2002 even the most exposed members of the public identified as living near to Sellafield in Cumbria, received radiation doses from food and other pathways that were below the statutory United Kingdom annual dose limit, European Union limits and UK Government targets to members of the public of 1 millisievert.

The long-term results of the CEFAS independent bi-annual monitoring of the Hurd Deep area confirmed in 2002 that the radiological impact of these disposals was insignificant, although independent observers like Greenpeace have called into question the robustness of the barrels which they believe are corroding and may cause a risk in the future. The Jersey results in the CEFAS survey were that the concentrations of artificial radionuclides in the marine environment (particularly shellfish) of the Channel Islands and the effects of discharges from local sources continued to be of negligible radiological significance. They confirmed that these doses were less than 1% of the limit and all concentrations show no increase in historic levels. Furthermore, because such low levels have been detected, it is difficult to apportion radioactivity to different sources, including weapons test fallout and the effects of Chernobyl.

The OSPAR Convention obliges signatories to achieve continuous reductions in discharges, emissions and losses of radioactive substances, with the ultimate aim of achieving concentrations in the marine environment of close to zero for man made radioactive substances by the year 2020. In line with their obligation under OSPAR, the UK Government announced the permanent cessation of disposal of such material at sea in 1998. At that meeting, contracting parties agreed that there would no longer be any exception to a prohibition on the dumping of radioactive substances, including wastes (OSPAR, 1998). France is also a signatory to OSPAR and, in view of the expansion plans for the Cap de la Hague plant; it seems highly unlikely that this target can be met in just 20 years time.

Of greater concern is the damage that exposure to ultra-violet (UV) radiation from sunlight can do. Between 1999 and 2001 there were an average of around 750 new cancerous tumours registered each year and of these 3% in Guernsey and 3.7% in Jersey were malignant melanomas (skin cancers). We can see that the 20-64 age group is increasingly at risk (Figure 42). Jersey is the sunniest place in the British Isles and recently Jersey Meteorological Office in conjunction with the Health Protection Unit has provided daily information on UV index to allow people to make informed choices about their behaviour on sunny days.

5.0 Responding to the state of the environment

5.1 Addressing climate change (Perspective 1)

5.0 Responding to the state of the environment

As we have seen in the previous sections, the pressures placed upon our environment often cause detrimental changes. This section explores how we either do or intend to respond to the problems our environment faces. We explain existing and proposed policy, strategy and statutory responsibilities in relation to the 12 environmental perspectives we have identified.

The States of Jersey Strategic Plan 2005-2010 points out that to achieve the conservation of both biodiversity and our natural resources, both community efforts and comprehensive, long-term environmental policies are required. The Island needs to plan proactively to manage future needs sustainably.

Detailed policy areas include *inter alia* :-

- Traditional landscapes and urban issues
- Ensuring that unpolluted air, clean water and uncontaminated land exist as a basic right for all
- Conserving and enhancing habitats and species
- Adopting far-sighted energy and liquid and solid waste policies
- Introducing policies that minimise the impact of the population on the environment
- Promoting community involvement in Island affairs
- Planning a sustainable future with young people
- Developing Jersey's international Personality

As we turn to each of the environmental perspectives these different issues will be explored more fully.

5.1.1 Reduce emissions - energy efficiency and renewable energy

The States of Jersey Strategic Plan 2005-2010 pledges to **'Adopt far-sighted energy and liquid and solid waste policies'** and The Environment and Public Services are charged with **'introducing a comprehensive energy policy'** by 2005 and a success indicator will be measured by 'compliance with energy consumption targets by States Departments'.

Despite a recent cut in CO_2 emissions as a result of the importation of French electricity, with the recent connection to the French electricity supply there has been a one-off non-repeatable reduction in Jersey's CO_2

emissions. Nevertheless there are still environmental consequences of nuclear-generated fuel and so the drive for energy efficiency must be continued through energy efficiency measures and the consideration of renewable energy and even the use of fiscal mechanisms to change behaviour if necessary.

Within the industrial and commercial sectors the use of combined heat and power boilers (CHP) can result in 35% reduction in primary energy usage compared to that in power stations. Currently there are 5 CHP boilers in Jersey which results in a 30-50% reduction in CO_2 emissions compared to that of coal/oil fired power units. Updating the Building Bylaws has led to improved standards of energy efficiency, particularly in domestic housing. Examples of initiatives to achieve better energy efficiency are the wider installation of cavity and loft insulation, and the use of gas condensing boilers for heating or hot water. These energy efficiency programmes often save individuals money on fuel costs and therefore the uptake of these measures should be popular and in other countries are their adoption is encouraged by the use of pay-back periods.

The focus for driving down emissions is still therefore by reducing waste and car use and these are expanded upon in section 5.8 and 5.12.2 respectively where waste management and sustainable transport polices are discussed.

Jersey has opportunities to produce renewable energy arising from tidal and wind sources. However these measures are not without their own environmental pressures. For example tidal barrages commonly affect marine life and coastal processes, although underwater tidal turbines are considered to have less of an impact whilst wind farms can affect the routes of migrating birds and bats. Any such developments would be subject to an Environmental Impact Assessment to ensure the environmental benefits are positive.

The use of domestic solar heating and photovoltaic systems (with the appropriate planning permissions) is a way for individuals to make a positive contribution to the energy budget of their homes. The Island Plan 2002 outlines the need for effective energy efficiency to be a major feature in the design of new buildings through building design, materials, layout and orientation. Clearly improving the energy efficiency of buildings can significantly reduce resource exploitation and greenhouse gas emissions, so contributing to sustainable development. Policies in the Island Plan 2002 state that when considering planning applications, the Environment and Public Services Committee will encourage:

- The use of heat recycling, solar energy and passive solar gain;
- The use of materials with reduced energy inputs and low maintenance needs; and
- Layouts that reduce wind chill and maximise the efficient use of natural light.

Personal initiatives to save energy can be simple and can be very effective if there is widespread uptake. For example: use energy saving light bulbs; turn household thermostats down by 1o; turn off appliances at the mains; don't overfill your kettle; turn off unnecessary lights; insulate your house. Many other examples are available at http://www.wearewhatwedo.org.

5.1.2 Preparing for rising sea levels and a changing climate

As we have seen the Island's sea defences are in need of constant repair to maintain their effectiveness. Predicted rises in sea levels and changes to our climate will require a review of the approach to coastal defence and its sustainability. This is proposed by the Environment and Public Services Committee in developing a comprehensive Shoreline Management Plan in order to ensure that future coastal and flood management is planned and designed with a full appreciation of its environmental implications as well as the operational and cost considerations.

Predictions of more extreme storms and changes in the distribution of rainfall throughout the year highlight the need for integrated flood management strategies. Occasional failures in water quality standards downstream of the sewage treatment works are a result of the processing of water-borne sewage which is currently carried by sewers to the treatment plant at Bellozanne. The extensive foul sewer network serves all the major populated areas in the Island but the existing surface water drainage network is not particularly extensive and there are large areas where there is no separate surface water system. This can result in surface water draining into the foul sewer network, causing overloading of sewers and pumping stations in times of rainfall and ultimately leading to the overflow of foul sewage to sea. In total, the Island's foul and surface water system is 391km long, yet it is recognised that there are 112 areas still in need of mains sewers and the Environment and Public Services Department is working to a programme which will extend the sewers to these areas. In all, 81 pumping stations are strategically positioned in the Island to pump the contents of the sewer to the treatment plant at Bellozanne.

Recent development of the surface water drainage system has concentrated mainly on flood relief at known problem areas. The drainage scheme in St. Helier which includes the Cavern has prevented over one hundred discharges (270 million gallons) of untreated sewage into the sea since it was commissioned in May 1998. Its only failure in 2000, at the beginning of November, which led to a spillage of 1.5 million gallons, resulted from the fifth wettest October on record. The Committee recognises that there is still much work to be done to protect the Island from the elements, especially from heavy rainfall and from the overtopping of the sea on the south coast during storms.

5.1.3 Monitoring climate change (Perspective 1)

As part of 'State of the Environment Reporting' the Environment Department will be reporting on the following issues:

Headline Issue	Indicator measures
1. Energy consumption	■ Final energy consumption (total and per household)
2. Trends in greenhouse gases & substances that deplete the ozone layer	■ CO_2 emissions by end users (industry, domestic, transport, services) ■ Total consumption of CFCs

Headline Issue	Indicator measures
3. Weather indexes	■ Average temperature, rainfall patterns, frequency of severe storms ■ Sea temperature, wave height
4. Phenological observations	■ Annual recording of the first date of key biological events
5. Policy response to pollutant levels	■ Compliance with key international standards e.g. Kyoto, Vienna and Montreal protocols and accepted industry guidelines
6. Success of policy instruments	■ Compliance of vehicle emissions with legislation
7. Road traffic	■ By type of vehicle ■ Road traffic - annual car mileage per capita ■ Mode of travel to work
8. Sea defences	■ Change in length / height of sea defences

5.2 Maintaining and enhancing air quality (Perspective 2)

Under Strategic Aim Four **'To protect the natural and built environment';** the States pledge to **'ensure that unpolluted air, clean water and uncontaminated land exist as a basic right for all'.** Implementation of the Air Quality Strategy should achieve positive trends in the success indicators: 'reduction in general levels of pollution; a decrease in the number of pollution-related health problems (*e.g.* asthma); fewer pollution incidents' and 'Less long-term environmental damage as a result of pollution incidents'.

5.2.1 Jersey's Air Quality Strategy

In 1999 an Air Quality sub-group of the States of Jersey Monitoring Working Group was formed comprising officer representatives from the relevant departments. Steered by the Health Protection Unit, a States of Jersey Air Quality Strategy (AQS) was produced by UK Consultants and they summarised the following.

1. The most challenging issue was identified as the improvement needed in road transport related emissions. Fifteen options were provisionally assessed in terms of their cost effectiveness at reducing the emissions in the required geographical area. The most cost effective options are listed below but further examination is needed to determine the cost effectiveness of achieving a measured air quality improvement and to quantify other potential, socio-economic benefits and impacts :-

- Compulsory, periodic testing of vehicle emissions (MOT);
- Park and Ride Schemes in St. Helier;
- Parking (including charges and on-street parking restrictions);
- Urban bus schemes;
- Vehicle scrappage subsidies;
- Vehicle access limits;
- Variable tax on engine size and age;
- Pedestrianisation;

- Alternative fuels;
- Walk to school plans;
- Traffic management.

Within the government's fiscal strategy some of these measures are being considered more fully as positive/punitive environmental taxes.

2. Continued monitoring of air chemistry with improved equipment was recommended to assess local trends and compliance with internationally agreed targets. Alongside this monitoring of air quality it was recommended that attention must be paid to traffic flow reductions, traffic speed increase where there is current congestion and passenger numbers using public transport.

3. Indicators to determine the impact on other environmental and socio-economic issues should also be considered such as the measurement of noise.

4. Effective communication of key information is essential to ensure that the suggested transport improvement measures to achieve improved air quality are regarded as socially acceptable for those living in and visiting Jersey. Awareness raising to ensure the uptake of air quality improvement policies, particularly in relation to the choice of transport mode, will be essential.

Given the link between the problems of local air quality and transport, as well as the community's attitude towards the use of the private car, public co-operation is essential. The AQS has yet to be taken to the States. Nevertheless it links into other key policy documents such as The Jersey Island Plan 2002 and the Sustainable Travel and Transport Plan - the latter document is currently being developed using a multi-agency approach.

The Island Plan 2002 outlines policy, which is being partially implemented by the St. Helier Street Life programme, which aims to improve the existing highway especially for pedestrians and cyclists (see example left). Most improvement in long-term air quality is typically achieved through the planning process. The Air Quality Strategy suggests that the existing requirement for Environmental Impact Assessment should incorporate Health Impact Assessments, which assess the air quality impact of a proposed development on the health of local residents and visitors. It is suggested that the consideration of mitigation measures to reduce emissions should be an integral part of the environmental impact of any planning application.

The link between good health and appropriate exercise is a well accepted one. This report has shown how Jersey supports a culture heavily dependent on the private car. The Jersey Statistical Review (2002) reports data from the Medical Officer for Health that coronary heart disease is the single main cause of avoidable premature death in Jersey and in the year 2000 accounted for 108 out of a total of 788 deaths. A total of 33% of people locally are reportedly overweight and a further 12% were classified as obese.

5.2.2 Suburban air quality

Air quality sometimes does not meet compliance levels (*e.g.* nitrogen dioxide / particles) locally but it is hoped that implementation of the measures suggested by the Air Quality Strategy should improve the situation. Advances should also be achieved in the next few years with the improvement of engine design (particularly bus engines), the relocation of the bus station to the Island Site and road changes as part of the St. Helier Life program. Monitoring has shown that concentrations of air pollutants do appear to be falling with time but also EU Directive limits are becoming stricter and more health information is becoming available. Furthermore, the availability of biodiesel and the move towards gaseous fuels, such as the vehicles operated by Jersey Gas, should improve the situation. In London the trialling of water diesel emulsion is occurring, which is claimed to halve particle emissions and cut NO_x emissions by 23%.

5.2.3 Incineration

Other improvements to air quality include the two new cremators, which comply with the UK Environmental Protection Act 1990 and the proposed new waste to energy plant to replace the current waste incinerator which is programmed for construction by 2008 (see section 5.8.5).

5.2.4 Radioactivity

The Health Protection Unit co-ordinates radon survey requests for householders and arranges with the National Radiological Protection Board (NRPB) for samplers to be sent to those requiring a test. Environmental Health Officers help in the interpretation of results and advise on remedial work required. The Emergency Planning Officer continually monitors background radiation levels at three sites across the Island and there are contingency plans in place in the event of a radiological incident effecting Jersey.

5.2.4 Monitoring air quality (Perspective 2)

As part of 'State of the Environment Reporting' the Environment Department will be reporting on the following issues:

Headline Issue	Indicator measures
9. Concentrations of air pollutants and compliance with international standards	■ Atmospheric pollutant levels: e.g. sulphur dioxide, nitrous oxides, volatile organic compounds, ground level ozone, particulates, radioactive substances ■ Origins of atmospheric pollutant levels by source e.g. crematorium flue particulates, municipal waste incinerator flue gas emissions, power station stack emissions ■ Measure compliance of above with international standards
10. Days where air pollution is moderate or higher	
11. Public health issues	■ Incidence of asthma and chronic heart disease

5.3 Jersey's position in contributing to global biodiversity (Perspective 3)

Aim Seven of The Strategic Plan 2005-2010 is **'To Develop Jersey's international personality'** and, in the spirit of international recognition and co-operation, the States pledges to **'demonstrate responsible and cooperative behaviour with regard to global issues'**. This implies active compliance with the many international multi-lateral Environmental agreements to which Jersey is a signatory.

5.3.1 Jersey's international obligations

Jersey's geographical position makes it an important refuge for many migratory species or those with large home ranges *e.g.* birds, bats and marine mammals. Because of this Jersey is a signatory to the Bonn Convention on the Conservation of Migratory Species of Wild Animals (CMS) which aims to conserve terrestrial, marine and avian migratory species throughout their range.

- **Avian species** ~ An Affiliated Instrument of CMS is the African-Eurasian Waterbird Agreement (AEWA) which addresses 172 species of birds ecologically dependent on wetlands for at least part of their annual cycle. The Ramsar Convention is designed to protect both migratory and resident wading birds. Jersey has an obligation to monitor relevant species under both agreements.

- **Marine species** ~ An Affiliated Instrument of CMS is the Agreement on the Conservation of Small Cetaceans of the Baltic and North Sea (ASCOBANS). Jersey is required to monitor the ASCOBANS-listed species found in local waters to ensure they maintain a favourable conservation status as well as retrieving and reporting on by-catches. Recent resolutions (Paris, 08/03) place particular emphasis on the need for "decent abundance estimates". Jersey is working towards extension of the International Convention for the Protection of the North East Atlantic (OSPAR) Annex V to the Island which specifically relates to the protection and conservation of the ecosystems and biological diversity of the maritime area.

- **Species of bats** ~ An Affiliated Instrument of CMS is the Agreement on the Conservation of populations of European Bats (EUROBATS). It asks that listed bats and their key feeding and roost sites are protected and monitored.

5.3.2 Convention on the International Trade in Endangered Species

Jersey has a responsibility to ensure it is not a destination for illegally acquired endangered species and therefore is a signatory through the UK to the Convention on the International Trade in Endangered Species (CITES). The presence of the Durrell Wildlife Preservation Trust and the Eric Young Orchid Foundation locally mean that our small Island is playing its part in preserving the some of the world's most endangered species. The States of Jersey has agreed to produce primary CITES legislation by 2006. This will support the work of these conservation institutions and also ensure that any movements of endangered species are regulated and licensed (Figure 43). This is particularly relevant since many animals entering the exotic pet

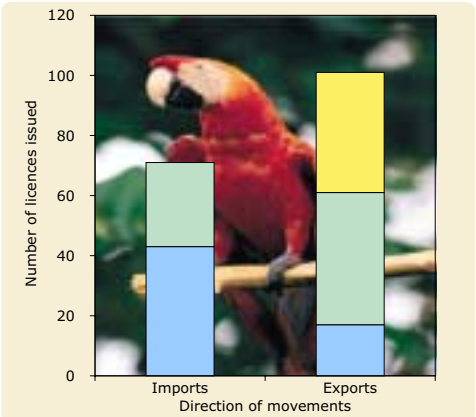


Figure 43 Licensed CITES movements January to November 2004. Note that the exports are more numerous and comprise primarily of conservation related movements (yellow bar - the Eric Young Orchid Foundation and green bar - The Durrell Wildlife Conservation Trust). Movements made by the local exotic pet trade dominate imports (blue bars) although The Durrell Wildlife Conservation Trust import endangered species for their breeding programmes. **Source:** Unpublished data, The Environment Department.

5.4 Managing the land as a resource - land use (Perspective 4)

trade locally are listed as endangered by CITES and their movements require regulation even if they originate in captivity.

5.3.3 Monitoring Jersey's position in contributing to global biodiversity (Perspective 3)

As part of 'State of the Environment Reporting' the Environment Department will be reporting on the following issues:

Headline Issue	Indicator measures
12. CITES	■ Number of regulated movements for conservation purposes as a proportion of movements relating to the exotic pet trade
13. Status of marine mammals	■ Cetacean by-catch ■ Marine mammals species diversity, distribution and abundance
14. Status of migratory birds	■ Bird indexes at key sites ■ Number of site protections through planning process
15. Status of bat populations	■ Number of roosts lost to development as a proportion of those protected by legislation ■ Species diversity and abundance at key foraging sites ■ Roost and hibernacula occupancy (natural and artificial)

The States of Jersey's Strategic Plan 2005-2010 gives clear priority to environmental issues and sustainability. Strategic Aim Four is to 'Protect the Natural and Built Environment'. It points out that:

> **'Few Islanders would disagree with the desire to preserve traditional landscapes -both natural and built - and conserve and enhance the natural habitats that make Jersey unique. As well as being important for the Island's economy, our physical environment is essential to our well-being. Uncontaminated land, air and water should exist as a basic right for all people and in order for this to be achieved both community efforts and comprehensive, long-term environmental policies will be required. Organised and effective urban planning is also a key tool to enhance our quality of life. It can help us to ensure that common disturbances, such as noise pollution, overcrowding in urban areas and traffic congestion, are alleviated. The prudent and respectful use of natural resources is another key factor: The Island needs to plan proactively to manage future needs. Only then will we be able to plan for the future of all generations of Jersey citizens'.**

The Strategic Plan goes on the pledge that the States will:

- **'Implement comprehensive policies for effective, innovative and intelligent land use and development control' and**

- **'Protect and promote Jersey's environment as one of its most important assets'.**

The policy document relating to land use and development control is the Island Plan - first developed in 1987 and updated after extensive consultation and approved by the States in July 2002. The Island Plan 2002 points out that the preparation and adoption of the Island Plan for the period to 2011, is only the first stage in achieving improvements in the quality of life for the Island's residents and visitors, for protecting the environmental and cultural attributes of the Island and in establishing the principles of change.

The Island Plan 2002 has identified a number of Policy areas that need to be considered further and proposals to be implemented if the objectives of the Plan are to be achieved. The successful implementation of the Plan will be dependent upon resources from the private and voluntary sectors as well as the public sector. In many areas there will be a need to work in partnership and through joint initiatives to achieve common goals. The Environment and Public Services Department will have a central role to play in the co-ordination of development and investment. However, a number of the Plan policies and proposals will affect the capital and revenue budgets of other spending committees. The Environment and Public Services Department will primarily control its implementation of Plan policies by determining planning applications for development, including the use of conditions and obligations. There is also the need to prepare a number of Supplementary Planning Guidance Notes, development briefs and planning reports.

Overall though there are 20 general policies and, in general, applications which do not comply with these principles will not normally be permitted. The policies are as follows:-

G1 Sustainable development

All development proposals should in particular seek to:

1. Integrate new development with the existing built-up area
2. Promote the vitality and viability of the town of St. Helier and the defined rural and urban settlements
3. Re-use already developed land
4. Support an overall pattern of land-uses that reduce the need to travel and promote increased use of public transport, cycling and walking
5. Conserve or enhance the natural environment and cultural heritage of the Island
6. Minimize impacts on the Island and global environment

G2 General development considerations

Applicants need to demonstrate that the proposed development:

1. Will not unreasonably affect the character and amenity of the area
2. Will not have an unreasonable impact on neighbouring uses and the local environment by reason of visual intrusion or other amenity considerations
3. Will not have an unreasonable impact on agricultural land
4. Will not have an unreasonable impact on the landscape, ecology, archaeological remains or architectural features and includes where appropriate measures for the enhancement of such features and the landscaping of the site
5. Incorporates satisfactory provision of amenity and public open space where appropriate
6. Will not have an unreasonable impact on important open space or natural or built features, including trees, hedgerows, banks, walls and fosses;
7. Provides a satisfactory means of access, manoeuvring space within the site and adequate space for parking;
8. Will not lead to unacceptable problems of traffic generation, safety or parking;
9. Is accessible by pedestrians, cyclists and public transport users, including those with mobility impairments;

G2 General development considerations

10. Will not have an unreasonable impact on public health, safety and the environment by virtue of noise, vibration, dust, light, odour, fumes, electro-magnetic fields or effluent;
11. Is not at risk from flooding or does not increase the risk of flooding elsewhere;
12. Does not have an unreasonable impact on the safe operations of the Airport;
13. Where possible makes efficient use of construction and demolition materials to avoid generation of waste and to ensure the efficient use of resources;
14. Takes into account the need to design out crime and to facilitate personal safety and security;
15. Encourages energy efficiency through building design, materials, layout and orientation; and
16. Includes the provision of satisfactory mains drainage and other service infrastructure.

G3 Quality of design

A high standard of design that respects, conserves and contributes positively to the diversity and distinctiveness of the landscape and the built context will be sought in all developments.

G4 Design statements

Where a development is likely to have a significant impact on the quality and character of the physical and visual environment due to its location, scale or type of development, the Planning & Environment Department will require an applicant to submit a design statement with the planning application. The design statement should provide details as to how the development responds to the need for quality design and *inter alia* should set out:

1. the principles of the design, describing how the design will enhance, re-interpret and complement the character of the area;
2. a detailed landscape and visual impact assessment;

G5 Environmental Impact Statements

An Environmental Impact Assessment provides a proper assessment of the environmental effects of a proposed development and helps ensure that any impacts can be avoided, or mitigated against. Environmental Impact Assessments (EIAs) are part of the development control framework. The aim is to ensure a consistent and detailed examination of the potential impacts on the environment of certain development proposals before their implementation.

G6 Transport Assessments

The Planning & Environment Department will require that a Transport Assessment is carried out for proposed development that is likely to have significant transport implications.

G7 Control of unauthorised development

Where unauthorised development occurs the Planning & Environment Department will take appropriate enforcement action. Any development not undertaken fully in accordance with any permission granted by the Planning & Environment Department also constitutes unauthorised development.

G8 Access for all

Developments to which the public has access must include adequate arrangements for safe and convenient access for all and in particular should meet the needs of those with mobility difficulties.

G9 Designing out crime

The Planning & Environment Department will look for evidence of good design practice aimed at reducing the incidence or fear of crime in considering proposals for new development.

G10 Planning obligations

Where, as a direct consequence of a proposed development, additional infrastructure or amenities are required within a development site, the Planning & Environment Department will negotiate the provision of appropriate facilities with the developer and where necessary the provision of financial will be sought from the developer.

G11 Sites of Special Interest

Sites of Special Interest will be designated for protection in recognition of the importance of their:

- special zoological, ecological, botanical or geological interest; or
- special architectural, archaeological, artistic, historical, scientific, or traditional interest that attaches to a building or place.

Written guidance will be provided and advice offered on appropriate management and maintenance practices for Sites of Special Interest. There will be a presumption against development that would have an adverse impact on the special character of a Site of Special Interest.

Where a proposed or designated Site of Special Interest is at risk of damage, and an agreement with the landowner or tenant to avoid such damage cannot be made, the Planning & EnvironmentDepartment may use powers of acquisition to safeguard and manage the site as an alternative to its statutory powers.

Where land is voluntarily put up for sale the Planning & Environment Department may purchase proposed or designated Sites of Special Interest and manage them or enable other appropriate bodies to manage them. This will be subject to States' approval.

G12 Archaeological resources

The Planning & Environment Department will normally require an archaeological evaluation to be carried out for development proposals which may affect archaeological remains.
Development which would adversely affect archaeological remains will normally only be permitted where the Planning & Environment Department is satisfied that the importance of the proposed development or other material considerations outweigh the value of the remains in question.

G13 Buildings and places of archaeological and historical interest

There will be a presumption in favour of the preservation of the architectural and historic character and integrity of registered buildings and places. Applications for the alteration or change of use of a registered building must contain sufficient information against which the impact on the fabric and appearance of the building can be assessed.

G14 Protection of trees

Proposals which would result in the loss of or damage to protected and other significant trees will not normally be permitted

G15 Replacement buildings

The replacement of buildings will normally only be permitted where the proposed development would:

1. Enhance the appearance of the site and its surroundings;
2. Replace a building that it is not appropriate to repair or refurbish;
3. Not have an unreasonable impact on neighbouring uses and the local environment by reason of visual intrusion or other amenity considerations;
4. Involve loss of an existing building that is unsympathetic to the character and amenity of the area; and
5. Be in accordance with other principles and policies of the Plan

G16 Demolition of buildings

The demolition of a building or part of a building will normally only be permitted where the proposal:

1. Involves the demolition of a building or part of a building that it is not appropriate to repair or refurbish;
2. Would not have an unacceptable impact on a Site of Special Interest, Building of Local Importance or a Conservation Area;
3. Would not have an unacceptable impact on the character and amenity of the area;
4. Makes adequate provision for the management of waste material arising from demolition
5. Is in accordance with other principles and policies of the Plan

G17 Contaminated land

Proposals for development on contaminated land will normally be permitted where:

1. The developer carries out and submits a full and satisfactory investigation of the condition of the site to include, and fully identify, the nature and extent of contamination present and where it can be ascertained, the period over which contamination occurred;
2. The developer proposes a satisfactory programme of works to treat and/or remove the contamination present in a manner that is acceptable to the relevant regulatory bodies; and
3. The proposal is in accordance with other principles and policies of the Plan.

G18 Signs and adverts

Control will continue to be exercised over the display of advertisements, signs and notice boards.

G19 Satellite Antennae

Applications for the installation of satellite dishes will be judged on their merits, having particular regard to:

1. The nature of the building and its surroundings;
2. The type, size and colour of the equipment in relation to its background; and
3. Whether the building is a Site of Special Interest, a Building of Local Importance or within a Conservation Area.

G20 Light Pollution

Lighting within all new developments and environmental improvements will be designed to minimise the effect of sky glow whilst providing adequate illumination levels.

The Strategic Plan Aim 4.1.2 is to review the Island Plan by 2006 with the aim of producing a revised and updated Island Plan that makes optimum use of land whist protecting the Island's natural beauty and well kept countryside.

5.4.1 Meeting the needs for housing for the future

People living in Jersey without residential qualifications are able to live in lodgings, staff accommodation or registered lodging houses but cannot lease or purchase accommodation. Residential qualifications have been lowered so that they are now gained following fifteen years continuous residence (compared previously to eighteen) or by application to the Housing Committee. The new Island Plan performs the important function of ensuring that sufficient land is made available to be taken forward by the States, parishes, housing trusts and the private sector to meet housing requirements to 2011. It does not however, address issues such as subsidies and other intervention in the housing market, which are beyond the scope of this land-use plan.

The 1987 Island Plan was based on States' projections that significantly under-estimated the growth in the population and numbers of households that would occur over its time scale. By 1989 additional housing land had to be released to meet demand that had already overtaken the Plan's estimates. These trends continued during the 1990s; further zoning was needed, and this was one of the issues that prompted this review of the Island Plan. In order to address the continuing shortage of housing, the Jersey Island Plan 2002 allows for the construction of 2,860 homes in the 'qualified sector' over the first five years of the Plan period (*i.e.* equating to 90% of the estimated requirements). It is planned that these particular requirements be met from both existing sources (*e.g.* existing planning permissions, opportunities in the town for conversions, changes of use and re-development, opportunities for development in the Waterfront Area and windfall developments within the enlarged built-up area boundaries) as well as sites zoned specifically for Category A housing purposes.

The 'Homes for Jersey 2004' Report points out that 'currently, only five of the 11 sites rezoned for Category A purposes in the Island Plan have had applications favourably determined by the Committee'. Furthermore, the resolution of planning obligations on all of these sites remains to be undertaken before any development can commence. The Island Plan assumes that requirements in the 'unqualified sector, will be addressed by the market and provided through increasing availability of private lodgings in the existing building stock and the creation of new lodging houses and staff accommodation, as part of the day-to-day development process'.

The Strategic Plan 2005-2010 pledges that the States will **'seek to maximise development for housing purposes in 'brownfield' sites'**. 'Brownfield sites' refers to land that has previously been used for any purpose and is no longer in use for that purpose and are considered far better able to take development than previously unused 'greenfield' sites. Success indicators will be limited encroachment onto green zone countryside and a reduction in the number of 'greenfield' developments.

5.4.2 Improving the built environment

For health

The Jersey Health Survey (Gordon, Lloyd, and Heslop, 1999) assessed living conditions and health status. A significant association between tenure and different measures of health was found. Those respondents living in owner-occupied or rented accommodation were significantly more likely to describe their health during the past year as being 'good' compared to those living in other kinds of accommodation. Similarly, a greater proportion of those living in owner-occupied and rented accommodation reported no long-standing illness, compared with less than a half of those in 'other' accommodation. Typically, those living in rented accommodation tended to be young, and the 18-29 age groups were the least likely to be living in a home that they considered to be in good repair.

Respondents describing their health during the past year as 'good' were significantly more likely to live in a home in a good state of repair than other respondents. The Health Protection Unit are presently drafting The Health and Safety (Housing) (Jersey) Law 200- which will deal with overcrowding, filthy and verminous premises and premises in disrepair.

For people

Jersey's historic built environment reflects its mix of French and English cultures and in many ways is unique. In common with its neighbouring countries, Jersey has sought to protect its historic buildings and the States is a signatory to several conventions which require the Island to actively protect its built heritage.

Nevertheless, the Planning Department recognises that, in the last half of the twentieth century, much damage was done to an urban fabric that had been built up over several hundred years. Particularly in St. Helier in the last thirty years the demands of development, the impact of the motor car and the loss of traditional materials to synthetic substitutes, have damaged the Island's built heritage. The booming economy has meant that St. Helier absorbed an unprecedented amount of development which, until the mid-1990s, was being implemented without a strategic framework or the guidance of development briefs. This sometimes led to developments going ahead at the expense of amenity space provision and the protection of the built heritage.

The new Island Plan places great importance on the built environment, the way in which it should be enhanced and how new development should contribute to the quality of urban life. The built environment provides the physical context within which most Islanders live, work and meet as a community. The Planning Department embraces contemporary design, as some of the latest buildings in St. Helier confirm, but the Committee is mandated by the States to protect the building and streetscapes that, together, make up the town known by Islanders. Across the Island there has been an understandable tendancy towards the use of modern materials mainly represented as being maintenance-free. However this has stripped many buildings

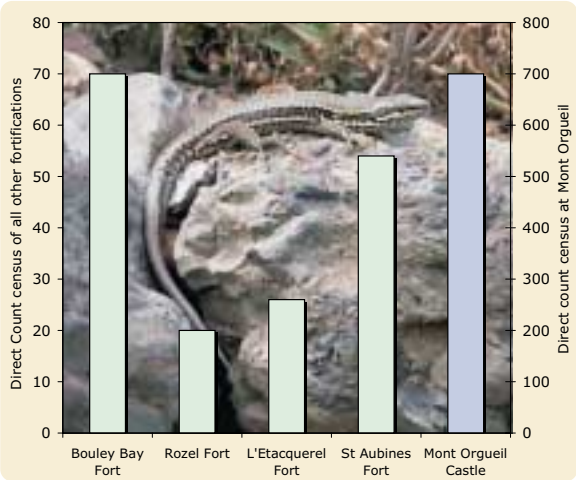


Figure 44 Populations of the protected wall lizards at historical sites around the Island (green bars). The much larger Mont Orgueil population is shown on the second axis with the blue bar. It has been suggested that wall lizards were introduced to the Island by sailors from the military explaining their strongholds in historical forts although these habitats currently now provide good quality, often undisturbed sites.
Source: 'The distribution and ecology of the Jersey Wall Lizard' Smith, 1997.

of their colour and texture and the Committee aims to reverse this trend by encouraging the use of materials and colour schemes that were once traditional features of Jersey buildings.

For wildlife

Sustainable development requires the balancing of the requirements of human activity with the needs of the environment. Some key issues are:

- How to ensure that development does not adversely affect environmental resources, so that where new development must take place, loss of biodiversity is avoided, reduced to a practical minimum or reversed.
- How to enhance biodiversity in existing open spaces and new developments.

All applications for development are checked by the Environment Department and any developments that could affect wildlife are carefully considered, and if necessary studies are carried out to establish the nature of the threat (Figure 44). Appropriate mitigation measures can then be recommended. The Conservation of Wildlife (Jersey) Law 2000 ensures that no development will seriously damage the populations of protected wild species.

As explained in 4.1.4, the 20% of the Island which is classified as urban can make a useful contribution to the overall biodiversity of the Island not least because of its total area. Overall increased awareness of biodiversity issues in urban areas for both local residents and through public bodies and elected members allow people to make decisions that can have immediate and important effects. Pressures on wildlife in urban areas and measures which can be taken to alleviate them are as follows:-.

- New development and redevelopment can damage or even destroy valuable habitats; development work should protect urban habitats which enhance biodiversity.
- Urban green spaces often consists of highly managed, largely artificial landscapes used for many competing interests and maintained using methods not always sympathetic to biodiversity. A more integrated approach to management is needed to balance the needs of wildlife and maintain biodiversity as a key management aim. Often this sort of less intensive management has lower cost implications.
- Gardening practices can be the source of introduced species with the capacity to cause damage to native habitats and species. Also gardening chemicals can cause harm to wildlife habitats. Adoption of more wildlife friendly gardening to replicate natural habitats and reduce the use of pesticides is recommended.
- Domestic pets can have adverse impacts on wildlife. It is important to note that cats will kill most small animals and, although they assist us by predating on 'pest' species like rats and house mice, the total number of species they kill includes a relatively large number of species we would like to

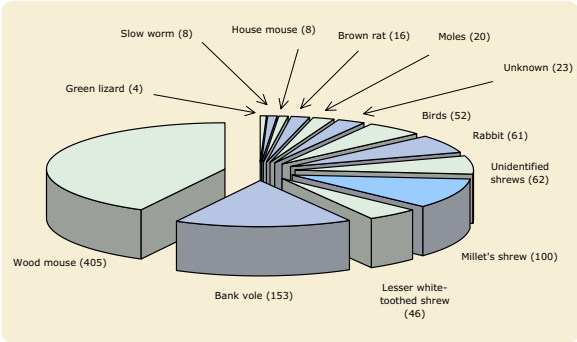


Figure 45 The results of one year's survey of cat predation habits as recorded by members of the public. Numbers in brackets are actual numbers of prey recorded. Note the small proportion of the total catch that house mice and rats comprise.
Source: The Jersey Mammal Survey', Magris & Gurnell 1998.

protect (Figure 45). Most hunting is carried out by cats at night and keeping cats inside overnight can reduce their hunting activities.

5.4.3 St. Ouens Bay Planning Framework

In order to recognise St. Ouens Bay as a 'special place' and to control the contrasting pressures placed upon it, the St. Ouens Planning Framework was developed in 1999; the limits of the area covered by the framework are shown in yellow on the aerial photograph left. It reviewed and expanded on earlier documents taking an holistic view of the Bay presenting objectives, policies and proposals for the way in which the land and landscape might best be managed to achieve the aim of:-

> 'Sustaining and enhancing the unique character of the natural and built environment of St. Ouen's Bay'.

The Planning Framework is incorporated into the Island Plan 2002 and its implementation occurs through development control and management initiatives. It is recognised that it is a dynamic policy and land management instrument which has taken a 15 to 20 year perspective and so will require frequent review.

The Planning Framework is grounded in a number of strategic objectives, which have three main functions:

- to establish the long-term intentions for St. Ouen's Bay;
- to provide clear guidance for the development and evaluation of policies; and
- to act as yardsticks against which the success of policies can be measured

In order to protect St. Ouen's Bay from the adverse impacts of development which may be permitted beyond the boundaries of the Special Area, a St. Ouen's Bay Buffer Zone is identified. When considering applications in the Buffer Zone, regard is given by The Planning Sub-Committee to the adopted objectives of the St. Ouen's Bay Planning Framework and to whether the application is likely to have a significant adverse impact on the Bay.

Furthermore, over the years the Committee has acquired land in the Bay in order to secure landscape and ecological enhancement and it is stated that, subject to the availability of resources, the Committee will seek to acquire land in St. Ouen's Bay, where this will help meet the objectives of the St. Ouen's Bay Planning Framework.

5.4.4 Environmental Impact Assessment

Reconciling demand for development and the need to preserve the environment in which we live is a dilemma resulting from increased environmental awareness. A tool to help in this respect is the process of

Environmental Impact Assessment (EIA), which is integrated into the planning control framework to ensure that a consistent and detailed examination of potential impacts to the environment is made of certain development plans before their implementation is permitted. Provision for a local assessment procedure was adopted in 2000 and now exists in the form of Environment and Public Services Committee policy and brings Jersey into line with the planning process across Europe and will prevent the development of projects which cause serious harm to the environment.

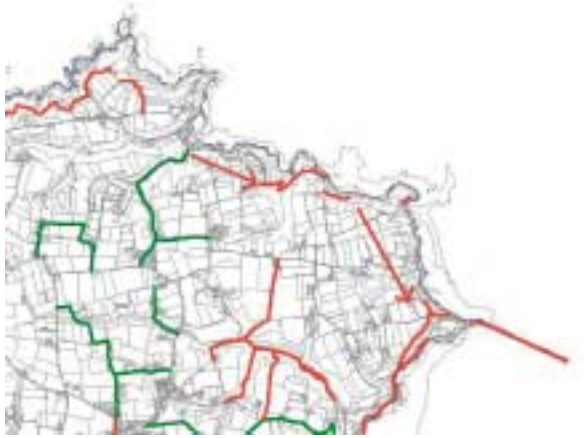
The policy requires those projects which could have significant environmental impacts to undergo an investigation to agreed standards, which will be carried out at the cost of the developer. The EIA will consider the views of interested parties, including the public, and cover:

- Details of the existing situation in the proposed location.
- Details of the project itself.
- A forecast of the impacts to the environment should the project go ahead.
- Recommendations as to how such impacts could be avoided including consideration of the 'no development' option.

The EIA process follows three stages and this process accompanies the standard development application to the Environment and Public Services Committee and is used in consideration as to whether the project should go ahead or not. If the proposals are not acceptable from an environmental perspective the problematic elements of the project will need to be reconsidered. The process can help developers to ensure that their proposals comply with appropriate environmental standards, take on board legitimate concerns and prevent expensive retrospective changes.

One of the strengths of EIA is that it operates as a process and therefore applies a systematic approach ensuring thorough, consistent and multidisciplinary analysis of development proposals in environmental terms. EIA's should be carried out at the very earliest stages of a development proposal thereby playing a part in the design of major projects.

The actual assessment process is complex and will involve feedback and interaction between the various stages. Not all developments will require an assessment. A selection process called 'screening' identifies those projects which are appropriate in a local context for further investigation through an EIA. The developer is responsible for producing an EIA to the satisfaction of the Environment and Public Services Committee and will usually pay for and appoint specialists to carry out the EIA. In most cases at the moment, this will be a UK environmental consultancy firm. The production of the EIA by non local specialists can provide an objective viewpoint, adding strength to the analysis. Examples of projects requiring EIAs to date include the extension of Simon Sand and Gravel and the Gigoulande Quarry and the redevelopment of the Airport Fire Training Ground.



5.4.5 Recreation and the environment

Public access

The States of Jersey Strategic Plan 2005-2010, Strategic Aim Four is to **'To Protect the natural and built environment'** and the Environment Department are charged **'to promote Jersey's environment as one of its most important assets'**, one success measure being an 'increase in the proportion of publicly accessible lands'.

The network of paths Island wide provide a valuable resource for both visitors and local residents, but requires maintenance and protection. 172km of used footpaths have been identified and mapped and the Environment Department is working with the Tourism Department, parishes and landowners to develop:-

- A "round-Island" coastal route
- Routes radiating from St. Helier and other urban centres
- Other circular routes including routes providing access to coastal destinations and other sites of interest. Examples under development include restoring the eastern railway route (top) and a circular network (bottom) in the north-east of the island (please see maps left).

Without a *"rights of way"* structure Jersey relies on:-

- Paths built on land owned by the States
- Paths constructed and maintained on land with an agreed licence between the States and owner
- Parish owned or administered paths
- Paths owned by other agencies *e.g.* the National Trust.

An example of the integration of recreational needs and those of the environment is apparent in St. Ouen's Bay. The St. Ouen's Bay Planning Framework points out that tourism promotion of St. Ouen's Bay should build on its uniqueness as an open and undeveloped area. Informal recreational activities complement the character of St. Ouen's Bay as a special place, but need to be balanced with environmental concerns and land management priorities. Through co-operation, careful planning and positive management techniques it is possible to ensure that recreation and tourism development is sustainable. Visitor management should aspire to the principle that visitors 'only take photos and leave footprints'. Despite this aim a number of current activities such as road sprints and four wheel rallies will continue to take place, being exempt under the 28 day rule for temporary uses.

There is an opportunity to encourage appropriate uses within different areas of the Bay based on the relative capacity of the natural environment. La Mielle de Morville at the north end of the bay was a municipal rubbish dump and extensive restoration in the 1970s led to a Civic Trust Award. This area is more able to sustain visitor activity of particular types and acts to deter visitor activity away from particularly sensitive areas like Les Blanches Banques.

Aesthetic quality

Despite a dense road network spanning some 724km Jersey has a network of over 74km of 'Green Lanes' where a speed limit of 15 mph is imposed and priority to given to walkers, cyclists and horse riders. Green Lanes exist in all but three parishes and it is anticipated that the network will be extended to all 12 parishes over the next few years to provide a linked Island wide network. There is also a cycling network which includes coastal and rural cycle routes together with an Airport cycle route. The network consists of 154km of on road routes and an off road track running along the south coast from St. Helier to Corbiére.

The high aesthetic quality of the Island is the result of considerable effort by the Public Services Department. Public services have a dedicated team of mobile cleaners who attend to the municipal needs of the Island 365 days per year. The Cleaning Section is responsible for cleaning the Island's roads, pavements, promenades, beaches, precincts and public toilets. Approximately 64 full time staff are responsible for the daily task of maintaining Jersey's reputation as a 'clean Island'. In order to maintain this status approximately 384km of roads and pavements are visited six times a year, 726 bins are emptied Island wide on a daily basis and approximately 6 400 road gullies are emptied twice a year.

Many semi-natural sites are used extensively by dog walkers and not all act responsibly in cleaning up after their dogs. Not only does this pose health and safety issues for other site users it can damage some fragile ecosystems by changing soil chemistry and ultimately affecting plant communities. A campaign launched by the Environment Department in 2004 aims to raise awareness and provide solutions in the form of plastic bag dispensers on affected sites, increased media coverage and a steering group comprising of many interested parties.

5.4.6 The Jersey Mineral Strategy

In 1995 the States requested the Planning and Environment Committee (now the Environment and Public Services Committee) to bring forward proposals in respect of the exploitation of mineral resources. Consequently, in November 1996, consultants were appointed to undertake a study of mineral options for the Island and to recommend a framework for determining future mineral development. After extensive consultations with the stakeholders from the industry, environmental groups and officers of the States of Jersey, Arup's report was published in 1999. The document examined the social, economic and environmental implications of current mineral extraction and future supply options. In 2000, the Jersey Mineral Strategy 2000-2020 was published by the Planning and Environment Committee to integrate the original mineral report and extend the review process and to include *inter alia* the findings of the 'Harbours Master Plan' (2000) which examined the feasibility of using La Collette Oil Jetty Basin for the importation of aggregates, as well as policy documents such as the Island Plan 2002 and St. Ouens Bay Planning Framework.

The preferred strategic options detailed in the Jersey Mineral Strategy and incorporated into the Island Plan 2002, concluded that:-

- Continuing production at Ronez into the longer term - the expansion of the remote Ronez quarry would have fewer intrinsic environmental impacts than expanding La Gigoulande or opening new quarries.
- Winding down Simon Sand and Gravel quarry by 2018 with progressive restoration of the site.
- Continuing production at La Gigoulande for 13-20 years, depending on extraction rates.
- Using La Gigoulande for land fill with inert waste and secondary aggregate production, once La Collette II has been filled.
- Restoration of La Gigoulande for a suitable end use.
- Creating a new berth and handling area at St. Helier for importing all of the Island's future sand requirements and a large proportion of its future aggregate requirements.

Recovered /recycled secondary aggregates play a leading role in managing the overall demand for minerals on the Island and Arup suggests this stream could be increased; this is developed in the Solid Waste Management Strategy as is emphasised by the opportunity to use exhausted mineral sites for waste disposal and recycling activities.

The Island Plan 2002 itself makes no specific provision for the extension of existing workings, or the establishment of new mineral extraction areas but it does allow for such proposals to be considered on their merits. The need for operators to restore disused mineral workings in order to protect the landscape is emphasised. It is stated in the Island Plan 2002 that the Environment and Public Services Committee will safeguard a site for a new aggregate importing facility at St. Helier Harbour.

There are no perfect solutions and given the emphasis placed on the future importation of minerals it is critical that Jersey Harbours are able to make suitable adjustments in order to secure acceptable port charges at St. Helier Harbour, and that appropriate highway provisions are made to ensure traffic flow to and from the port.

5.4.7 Monitoring land use (Perspective 4)

As part of 'State of the Environment Reporting' the Environment Department will be reporting on the following issues:

Headline Issue	Indicator measures
16. Changes in land cover	■ % Land Use ■ Area of new development on green / brown zone ■ Number of developments in protected zones under the Island Plan 2002 e.g. marine protection zone, green zone, zone of outstanding character

5.5 Contaminated land (Perspective 5)

Headline Issue	Indicator measures
17. Land use planning	■ Number of successful outcomes of environmental mitigation suggested through consultation on planning applications ■ % protected area of total area by ecosystem ■ Area of new habitat created under countryside renewal scheme
18. Protection of valuable features	■ Number of protected sites (SSIs / Ramsar sites/other designations) ■ Number of Tree Preservation Orders in the Tree Register

5.5.1 Development of a strategy for contaminated land and a remediation policy

In The Strategic Plan 2005-2010, under Strategic Aim Four, the States address the issue of contaminated land with the pledge to **'ensure that unpolluted air, clean water and uncontaminated land exist as a basic right for all'**.

Whilst in Jersey there is no specific legislation that applies to contaminated land, there are nine pieces of relevant legislation. Enforcement is currently mainly through the Water Pollution (Jersey) Law 2000 (protects 'controlled waters' from pollution) and the Statutory Nuisances (Jersey) Law 1999 (controls activities prejudicial to human health and a nuisance). Furthermore, Policy G17 - Contaminated Land of the Island Plan 2002 states that proposals for the development on contaminated land will be supported, subject to meeting all other policies within the Island Plan, where the potential for contamination has been properly assessed, and development incorporates any necessary remediation. Development on suspected contaminated land requires that a mediation statement is submitted which includes remediation objectives for ground, groundwater and any soil gas as well as a working method for implementation of remediation. Waste disposal control options need to be addressed and proposed supervision and monitoring of remediation must be outlined as well as all validation sampling and testing to be implemented. The process by which contaminated land reports are assessed is co-ordinated by the Environment Department. A strategy is currently being developed for publication in 2005.

5.5.2 Monitoring contaminated land (Perspective 5)

As part of 'State of the Environment Reporting' the Environment Department will be reporting on the following issues.

Headline Issue	Indicator measures
19. Area of land fill sites, mineral workings & quarries	
20. Contaminated land monitoring	■ Microbiology and chemical quality of key polluted sites

5.6 Managing water as a resource - freshwater quality and availability (Perspective 6)

In The Strategic Plan 2005-2010, under Strategic Aim Four, the States address water quality issues and pledge to **'ensure that unpolluted air, clean water and uncontaminated land exist as a basic right for all'**. This will be achieved by continuation of the ongoing work led by The Environment Department in partnership with the Health Protection Unit in 'Implementing a framework for comprehensive pollution controls that comply with EU standards with the emphasis on education rather than legislation'. Success indicators will be a reduction in general levels of pollution; a decrease in the number of pollution-related health problems (e.g. asthma); a decrease in the number of pollution incidents. Other ongoing work will support the States' pledge to 'Respond effectively to pollution incidents' and be measured using success indicator - 'less long-term environmental damage as a result of pollution incidents'.

Water availability is addressed by a pledge to **'adopt far-sighted energy and liquid and sold waste policies'** and will be measured by the success indicator - 'to ensure sufficient water for the Island's needs'. Critical in achieving this aim is the need to gain States' approval for the Water Resources Law.

5.6.1 The draft Water Resources (Jersey) Law (200-)

This Law is intended to provide for the protection, management and regulation of water resources in Jersey; the promotion of the conservation of the fauna and flora that are dependent on inland waters and of the habitats of such fauna and flora to the extent that those habitats are themselves dependent on inland waters; the conservation and enhancement of the natural beauty and amenity of inland waters; and for related purposes.

Water resource management includes the licensing and monitoring of groundwater abstraction and water conservation. Presently, overall groundwater abstraction is unknown because there is no legislation to ensure monitoring data is made available. It is the premise of the Law that, in accordance with the findings of extensive surveys by The British Geological Survey, water is a limited resource that should be carefully monitored and measured.

The draft Law charges a water resources regulator with responsibility for pursuing the following objectives :-

- Protecting water resources in Jersey;
- Monitoring, conserving, redistributing and augmenting those resources, and securing their proper use;
- Their sustainable development; and
- Promoting the conservation of fauna and flora that are dependent on inland waters, and their habitats to the extent that they are also dependent on such waters.

The Law requires the regulator, in administering the Law, to have regard to best environmental practice, a

precautionary approach in anticipating and preventing environmental damage by the abstraction or impounding of water and a cost principle by which the persons who abstract or impound water are responsible for the costs of the regulation and management of those activities. The regulator is also required to gather and make available information about the water resources of the Island.

Key to the Law is the protection of water resources. There is proposed a prohibition of the abstracting or impounding of inland waters otherwise than in accordance with a water resources licence issued by the regulator. However this is not intended to apply to the abstraction of small quantities of water (proposed as three cubic metres in 24 hours). It will not apply either to alterations or changes of use of existing dams and other impounding works, unless the result is to produce or is likely to produce effects that are materially different to before the enactment of the Law.

5.6.2 Reducing diffuse pollution through improvements in agricultural practice

The historic legacy of previous farming practices leave challenges for today's growers in reducing levels of pollution in water. Farming now has to adhere to a range of legislation and standards including those demanded by retailers. The Code of Good Agricultural Practice for the Protection of Water (The Water Code) Jersey is an approved Code of Practice for the purposes of Article 16 of the Water Pollution (Jersey) Law, 2000 and provides statutory practical guidance to farmers and growers to avoid causing water pollution. The Water Code stipulates the maximum application rates of slurry, manure and dirty water that can be applied to land in any 12 month period. In addition, each farm should produce a Farm Manure and Waste Management Plan which indicates the amount of slurry, manure and dirty water produced on the farm that will be collected and stored and how these products will be applied to land according to The Water Code to avoid the active and diffuse pollution of water. The proposed decoupling of subsidy and production in the form of a countryside stewardship scheme should further reduce over application of nitrate fertilizers.

Many preventative measures are taken to avoid water pollution by pesticides. All pesticide users are encouraged to follow the principle of integrated crop management which advocates that other methods of control, such as biological and cultural, are given priority. By planning ahead and monitoring weeds and pest and disease populations, pesticides only need to be applied if the risk is assessed as above a damage threshold.

The Pesticides (Jersey) Law, 1991 ensures the protection of the environment, users of pesticides and consumers of produce from the effects of pesticides through a Code of Good Practice which requires training in the safe and correct use, recording, safe storage and disposal of pesticides. Importers of pesticides must provide information on all products imported and this enables the Environment Department to monitor the quantity imported and ensure only approved products are brought into and used within the Island. The

approval of some pesticides which have frequently occurred in watercourses has been withdrawn in Jersey, although they are still widely used in the UK *e.g.* simazine, atrazine and chlorthal dimethyl. By June 2003, 124 destruction notices and 541 revocation notices had been issued on all banned products *i.e.* those specifically banned in Jersey and those banned because they have passed the permitted revocation date and were withdrawn from use.

Containers which fit directly onto the sprayer are increasingly used and reduce the chance of spills associated with mixing and filling the sprayer. Pesticide users are trained to a national standard, with a large part of their training including the prevention of water pollution and safer working practices. Many ways are employed to reduce the risk of pollution including:

- The use of low drift nozzles and only spraying in the right conditions in order to avoid spray drift being spread into hedgerows and ditches.
- Leaving grassy margins at field boundaries, alongside watercourses, headlands and on short corners.
- Spot treating weeds instead of blanket treatments where possible.
- Ensuring pesticides in granular form are totally incorporated.

Bulletins containing the latest best practice advice are regularly sent to growers. Farmers are also subject to independent national audit by UK verification bodies to ensure compliance with Retailer Protocols and, if selling certified organic produce, standards laid down by the appropriate certification bodies must also be met through an annual inspection.

5.6.3 Protecting wetlands

Wetlands are key habitats locally and we have seen that they are in decline with consequences for the species they support and as water regimes across the Island. Whilst there is protection in the form of the Ramsar designation and the Marine Protection Zone for marine habitats, terrestrial wetlands are less covered but will be protected by the draft Water Resources (Jersey) Law 200-. Ramsar designation can be applied to appropriate terrestrial wetlands and consideration is being given to extending Ramsar designation to critical sites including St. Ouen's Pond, Grouville Marsh and Ouaisné (Please see map to the left).

5.6.4 Water Framework Directive

In December 2000, the European Community Directive 60/2000/EC the Water Framework Directive (WFD) was published to bring together existing water policy directives as well as standardise practice. The States of Jersey wishes to comply with the highest standards of environmental practice and strives to comply with the WFD.

5.6.5 Water Quality Objectives (WQOs)

The WFD places greater emphasis on the ecology of surface waters as a relative indicator of water quality. This is not to the exclusion of water chemistry, which is often critical in determining the ecological status of the water body. An explicit objective is to achieve 'Good Ecological Status' based on the plants and animals present.

Research undertaken by Middlesex University and the Water Resources Section of the Environment Department has shown that the diversity and abundance of macroinvertebrate communities is an effective tool in distinguishing biological water quality in our small local streams. In order for Jersey to be in a position to implement many biological aspects of the WFD, a stream classification system of biological water quality has been developed based on Water Quality Objectives; the local system parallels the WFD and descriptions of the categories are as follows :-

- High - no or minimal biological impact (a reference site)
- Good - slight biological impact
- Moderate - moderate biological impact
- Poor - major biological impact
- Bad - Severe biological impact

In setting WQOs regard must be paid to the current 'state' of controlled waters, including the substances that are present in them (*e.g.* nitrates, phosphates, pesticides or oil) and their concentrations and substances that are absent from the waters (*e.g.* oxygen). Then the necessary actions and time scales will be determined to meet these standards in the future.

Historically, many of the 58 stream sites from ten stream catchments monitored bi-annually have achieved high water quality status *e.g.* the Mourier and Rozel sites and long-term monitoring of the St. Peter's catchment have shown the extent to which water quality may have improved. Factors responsible for sites not meeting WQOs were autumn low-flow and habitat degradation through siltation. In 2004 an interim report indicated an increase in water quality in 20 of the 29 sites for which categories were set in 2001/2002. In autumn 2002, 78% of sites achieved WQOs and 94% met their WQOs in spring 2003.

The WFD presumes, in relation to groundwater, that it broadly should not be polluted at all and takes a precautionary approach comprising a prohibition on direct discharges to groundwater, and (to cover indirect discharges) a requirement to monitor groundwater bodies so as to detect changes in chemical composition and to reverse any anthropogenically induced upward pollution trend. Monitoring to this end is carried out by the Environment Department. Chemical WQOs have also been set for all Jersey's controlled waters based on EU standards after identifying lawful uses of each category of water body.

5.6.6 Water Catchment Management Areas (WCMAs)

Introducing WCMAs under the provisions of the Water Pollution (Jersey) Law 2000 would enable Jersey to comply with proposals for the implementation of the WFD. A particular strength is that the management of river basins and the setting of environmental objectives will be based on an integrated and sustainable approach based on whole river basin plans. Although not directly applicable to Jersey, the directive identifies a positive way forward for water resource management on the Island. A long-term and sustainable approach to the management of local water resources requires the whole of the hydrological cycle to be managed i.e. both quality and quantity. This can only be wholly achieved by the introduction of a Water Resources Law in order to monitor and regulate abstraction and impoundment. The designation of water catchment management areas could be achieved by designating each of the ten individual catchments on the Island. Presently comprehensive water quality data is held on seven of these.

5.6.7 Monitoring fresh water quality and availability (Perspective 6)

As part of 'State of the Environment Reporting' the Environment Department will be reporting on the following issues:

Headline Issue	Indicator measures
21. Water usage	■ Annual level per capital ■ Quantity at dipped sites ■ Abstractions and leakages ■ Volume desalinated water produced / number of days desalination plant run
22. Drinking & environmental water quality	■ Ground water quality - pesticides, microbiology, chemical) ■ Surface water- microbiological and chemical including BOD and nitrogen and phosphorous concentrations ■ Biological water quality of surface waters
23. Anthropogenic inputs	■ Nitrate, pesticide and fertilizer imports / usage ■ % adoption of countryside renewal scheme waste reduction proposed components including manure slurry disposal facilities
24. Regulatory efficiency	■ Pollution incidents by type - chemical/ sewage/ oil/ industrial/ agricultural/ natural ■ Number of prosecutions and outcomes under the Water Pollution Law ■ Levels of compliance with conditions set on discharge permits/certificates ■ Proportion achievement of Water Quality Objectives
25. Access to appropriate water treatment facilities	■ Proportion of the population connected to sewage treatment and waste water treatment

5.7 Maintaining marine water quality (Perspective 7)

In The Strategic Plan 2005-2010, under Strategic Aim Four, **'to protect the natural and built environment'**, the States pledge to **'conserve and enhance habitats and species'** as well as **'ensuring that unpolluted air, clean water and uncontaminated land exist as a basic right for all'**. This is relevant to marine environment as well as fresh waters as outlined in section 5.6.

5.7.1 Anthropogenic pollution

Pollution risks to the marine environment arise from many sources (land or sea). Particular risk could be from vessels carrying oil or chemicals and other polluting products, and some countries prevent single hulled vessels from going to sea near their shores, especially in poor weather conditions. Radioactive releases to local marine water have been shown to be well within national and international limits and the day to day operations at Cap de la Hague and Flamanville are considered to pose negligible risks. However, the possibility of significant incident at one of the installations will always pose a potential threat, which, given certain weather conditions and the nature of the incident, could be very serious. Jersey's territorial waters to the 12 mile limit are defined as 'controlled waters' under the Water Pollution (Jersey) Law 2000 so local pollution arising from terrestrial sources is enforceable under the law.

Locally, it is the role of The Marine Pollution Advisory Group to:-

- Develop co-operative plans for prevention and response between all relevant cooperating island parties to reduce or remove risks.
- Conduct joint reviews of risks and plans at regular intervals
- Provide advice on marine pollution prevention, preparedness and response as required.

5.7.2 Reducing the impact of effluent discharges

Since 2003 biological and chemical loading to the Island's main bathing water beaches have been monitored to assess potential problem areas and try to understand how the results integrate with land use and weather factors. The overall aim is to identify if action is necessary to protect the end user. Particular attention is paid to St. Aubin's Bay since the bay is thought to be the area at greatest risk from pollution from either point or diffuse sources since the catchment contains the sewage treatment works. It is already known that 98% of the inorganic phosphorus and 50% of inorganic nitrogen come from the Sewage Treatment Works. New technology will help to improve the quality of the effluent leaving the Bellozanne Treatment works. The 'Pegazur' process is designed to reduce nitrate levels in waters reaching St. Aubin's Bay, so helping the Environment and Public Services Department combat the growth of sea lettuce which affected the beach for much of the summer 2000.

5.7.3 Fish farming

The Island Plan 2002 recognises that fishing for shellfish, wet fish and fish farming are important economic activities, which need safeguarding and supporting. Policies have been developed that aim to sustain marine biodiversity and assist in ensuring the health of fish stocks and the conservation of their nursery grounds and feeding areas. It is recognised that the land-based part of the industry needs assistance in terms of access, servicing and cold storage. However, caveats are outlined so that the development will not unreasonably effect the character, amenity and visual impact of the area nor will they have an unacceptable impact on a Site of Special Interest or Building of Local Importance. The possibilities of unacceptable problems of traffic generation, safety or parking or unreasonable impact on public health, safety and the environment as a result of noise, light, odour, fumes or waste production must also be considered.

5.7.4 Monitoring marine water quality (Perspective 7)

As part of 'State of the Environment Reporting' the Environment Department will be reporting on the following issues:

Headline Issue	Indicator measures
26. Terrestrial inputs to marine waters	■ Outfall water quality (microbiology and chemical quality) ■ Radioactivity in the marine environment ■ Levels of compliance with EC Bathing Water Directive ■ Success of Jersey Harbours pollution reporting system

5.8 Waste management (Perspective 8)

As we have already seen, under Strategic Aim Four, the States pledge to **'adopt far-sighted energy and liquid and solid waste policies'** and success indicators include 'introducing a comprehensive liquid and solid waste policy; the successful commissioning of new waste disposal plant; an extension of the main drains network; a measurable decrease in waste per household'.

5.8.1 Dealing with waste

The internationally agreed *Waste Hierarchy* (Figure 46) sets out the ideal model for managing waste in order of merit from the top priority of avoiding waste production to the least desirable option of disposal

5.8.2 Waste prevention and minimisation

Whilst highly desirable, experience internationally has demonstrated that substantial progress in minimising waste production is difficult to achieve. Successful schemes in advanced European countries have targeted nappies, plastic bags and food packaging.

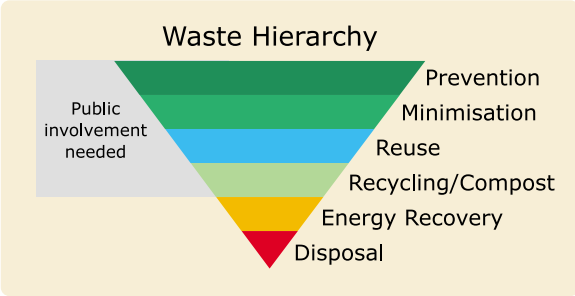


Figure 46 The Internationally Agreed Waste Hierarchy
Source: The European Union's Waste Framework Directive 1975.

Public participation is required to make this happen and changes in community behaviour with respect to waste will need to be driven by a mixture of education and fiscal incentives.

5.8.3 Re-use and recycling

Recycling of waste materials provides the dual benefits of diverting waste away from disposal or less desirable forms of waste management and making material resources available for the manufacture of new products. For some materials and products recycling also brings considerable energy savings.

Aluminium drinks cans, for example, are 100% recyclable and the process only requires 5% of the amount of energy to make cans from mined aluminium ore. Because of this the process is economically viable even after collection and transportation are considered.

Jersey already has a number of successful recycling schemes. Approximately 9% of our combustible waste stream is recycled but more could be achieved with the anticipated expansion in recycling of waste office paper, newspapers and magazines, aluminium cans, glass, clothing and perhaps high value plastics such as drinks bottles.

Construction and demolition activities account for over 70% by weight of Jersey's solid waste: we have seen that annually over 300,000 tonnes of inert materials is delivered for disposal to the La Collette Reclamation site. A proportion of the construction and demolition waste received at La Collette is recycled as secondary aggregates but the site has a limited life span so we must minimize the production of inert waste wherever possible. For this to be successful consideration of how to avoid unnecessary waste needs to begin at the earliest stages of planning and design. Currently, the Environment & Public Services Department is working with the construction industry to develop guidance on how to meet obligations set by policies in the Jersey Island Plan concerned with sustainable solid waste management and resource conservation and ways to reduce solid waste arising during the lifecycle of a development scheme (Policies WM1 and WM2).

A Waste Management Plan is now required as an integral part of the planning process for all developments likely to produce a significant amount of construction waste. This is a written document which demonstrates that positive and imaginative consideration has been given to reducing excavation and demolition waste in the design and construction of development schemes.

5.8.4 Composting

Composting is a fast-growing practice in the management of municipal wastes across Europe. Jersey already has a high composting rate with around 11% or 12,000 tonnes of the combustible waste stream being managed in this way, providing a valuable resource in the form of a soil conditioner. The current composting facility is temporary and in the longer term a new more efficient and sensitively located facility will need to be found.

Composting at home is also an excellent way of dealing with the organic component of household waste, avoiding the environmental impacts of collection and transportation. Public Services are promoting home composting through the availability of attractively priced home composting kits.

5.8.5 Energy recovery

Even with very advanced and expensive recycling and composting, there will continue to be significant amounts of waste left over that will need to be dealt with. Even if the predicted level of around 29% recycling and composting were to be achieved in the future, around 86,000 tonnes of waste a year would still have to be dealt with by the end of this decade.

As the Waste Hierarchy above shows, disposal is the least environmentally sound way of doing this. The solution adopted by most advanced countries is to recover the significant amounts of energy in the remaining waste once all inert waste and the recyclable elements have been taken out. In the process of disposing of the waste in Energy-from-Waste (EFW) plants, it is possible to produce valuable amounts of heat or electricity. The existing EFW plant in Bellozanne Valley currently produces 1 mega watt of energy but it has exceeded the end of its operational life. Upgrading the plant will be very costly and disruptive but maintenance costs of the existing facility are increasing dramatically, there are serious problems with the internal flues of the chimney, and the emissions do not meet the standards required. However, technology has made massive advancements in recent years. If the Island is to take full advantage of these improvements, we should be looking to build a state-of-the-art plant that will extract the maximum amount of energy with the very latest low-emissions and gas clean-up technology.

A draft Solid Waste Strategy was released for consultation in October 2004 (States of Jersey and Babtie Fichtner 2004). This document is the product of a long period of research and addresses the need to replace the existing incinerator by 2008, as well as other areas of solid waste management such as recycling. In the Strategy the Environment and Public Services Committee proposes that the existing plant at Bellozanne be replaced with a new Energy from Waste facility.

A new plant would produce about eight Megawatts of electricity and would make about 5 or 6 Megawatts available for the JEC's supply network. This would provide in the region of 5% of the Island's electricity consumption, thereby reducing our reliance on imported electricity.

While the decision does not yet have to be made on the exact technology that will be used, it is essential that there is acknowledgement of the need to replace the current incinerator by 2008 and that funding is set aside to cover the cost of this. Deadlines for such an important and complex engineering project are long and, in addition, a full Environmental Impact Assessment will be required for the planning process. This will involve extensive consultation with interested parties.

The draft Solid Waste Strategy acknowledges that currently Jersey provides "free" waste disposal. This is unsustainable in the long-term, and the high capital cost of the proposed measures will mean that a funding mechanism needs to be introduced. There are two main possibilities:

- Funding from the States capital programme;
- A "User Pays" structure.
  This would be based upon either:
  1. The quantity of waste produced. Whilst this can be seen as fairer, it is also more costly to implement; or
  2. The rateable value of properties. This is simpler, but is less useful in encouraging waste minimisation

5.8.6 The disposal of hazardous waste

The Memorandum of Understanding with the UK enabling the shipment of Jersey's hazardous waste expired in 2002 (see section 3.5) and since then hazardous waste for disposal has been stockpiled at Bellozanne. The UK took this stand because Jersey had made no progress towards introducing domestic legislation for waste management as required under the Basel Convention on The Control of Transboundary Movement of Hazardous Wastes.

However, on June the 8th 2004, The Waste Management (Jersey) Law 200- was approved by the States of Jersey and, once approved by the Privy Council, should be implemented in early 2005. Once in force, this law will allow the UK Government to extend their ratification of the Basel Convention to cover Jersey and so allow the Island to apply to export hazardous wastes that cannot be dealt with locally in an environmentally sound manner. The law also contains provisions for the regulation of certain waste streams within the Island and allow for 'environmentally sound waste management' on the Island.

5.8.7 Monitoring waste management (Perspective 8)

As part of 'State of the Environment Reporting' the Environment Department will be reporting on the following issues:

Headline Issue	Indicator measures
27. Waste arisings	■ Total waste arisings - solid and liquid ■ Solid waste arisings by sector ■ Household waste per capita
28. Controlling waste	■ Waste management - reused/recycled, composted, energy recovered or landfilled

Headline Issue	Indicator measures
28. Controlling waste	■ Liquid waste receiving full (tertiary) treatment ■ Materials collected from household sources for recycling/ reuse ■ Materials collected from industrial and commercial sources for recycling/ reuse ■ Compliance with countryside renewal scheme proposed components for waste reduction

5.9 The biodiversity of Jersey's natural and semi-natural habitats (Perspective 9)

5.9.1 Protecting habitats and species

The Strategic Plan outlines the need **'to protect and promote Jersey's environment as one of its most important assets'**. It pledges that the States will **'implement policies to protect all habitats, species, special places and buildings'**. Success indicators will be no further loss of species or habitats and an increase in the incidence of marine/land species. Proposals for achieving improving trends in these indicators will be in the form of the development and implementation of Species Action Plans and Habitat Action Plans. These plans are under development by The Environment Department in consultation with the relevant stakeholders and will be published as Volume II of the Biodiversity Strategy by 2006.

5.9.2 Habitat management and improvement

In total, 550 hectares of the Island are managed by the Environment and Public Services Department. Three of these have been designated as ecological Sites of Special Interest (SSI) and a further twelve sites, Island wide, are proposed SSI's due to the uniqueness of the habitat, vegetation communities or individual species found there. Improving public access to these areas is an important aspect of the work, and a network of over 96.5 km of footpaths and bridle paths cross and connect these sites. An annual programme of monitoring ensures that management objectives are being achieved and sustained and a balance is being achieved between the needs of nature conservation and public enjoyment of the sites.

5.9.3 Non-indigenous, quarantine and notifiable pests and diseases

The Environment Department's Inspectorate Service runs a plant health phytosanitary programme to prevent the introduction and establishment of non indigenous pests and diseases on local or imported plant material. Pests and diseases of note include stem and bulb nematode, Colorado beetle, potato cyst nematode, potato blight disease, Varroasis (a condition of bees caused by mites), fireblight and noxious weeds (Figure 47). The Inspection Service deals with a wide range of legislation relating to plant health and quality control under EU and local regulations. Plant health legislation affects the agriculture and horticultural industries, the environment, commercial and private gardeners and the general public. The Inspection Service works closely with the laboratory team at the Environment Department which is responsible for the diagnosis of all

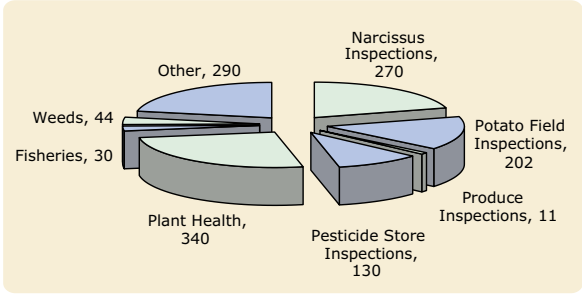


Figure 47 The activities of the Plant Health Phytosanitary Programme Inspectors in 2003. Figures represent the man-hours of the five inspectors.
Source: Unpublished data 2004, The Environment Department.

samples presented. In addition, all exported produce must comply with Jersey and EU Legislation and the Service ensures that the Island's reputation as a producer of high quality produce is maintained.

5.9.4 Conserving genetic diversity

The Island has committed to the Cartegena Protocol, which aims to 'contribute to ensuring an adequate level of protection in the field of the safe transfer, handling and use of Living Modified Organisms (LMO's also known as Genetically Modified Organisms GMO's), resulting from modern biotechnology that may have adverse effects on the conservation and sustainable use of biological diversity, taking also into account risks to human health and specifically focusing on trans-boundary movements'. Furthermore the import of any 'genetically manipulated material is prohibited under local legislation Destructive Insects and Pests (Jersey) Law 1983.

A current States' decision charged the Island with taking all reasonable steps to designate and maintain the Island of Jersey free from the growing of GMOs, but this did not include food or food products potentially imported into the Island. Following this decision in 1999, the then Agriculture & Fisheries Committee suspended a programme of research into a new strain of Jersey Royal potato which would have been resistant to the potato cyst nematode and reduce the reliance on the use of toxic chemicals. Nevertheless, the Cartagena Protocol requires additional legislation on the import and export of all GMO products.

In terms of preserving the local genetic stock, the proposed botanic gardens could play a valuable role by collecting and storing stocks of local provenance wildflower seed to provide for local landscaping schemes. The spreading of hay containing seed from local species-rich swards could also provide a source of seed.

5.9.5 Protection for marine habitats

Marine Protection Zones

As a basis for policy-making, the new Island Plan outlines the following objectives for the marine environment, which are to:

- safeguard and enhance marine habitats and biological diversity
- protect and enhance the seascape
- control and minimise water pollution
- protect both stocks and marine environments for sustainable fishing and fish farming
- safeguard the marine environment from all development except that which is essential for fishing and navigation
- promote sustainable recreation and tourism
- manage the shoreline, coastal defences and coastal zone in an environmentally responsible manner

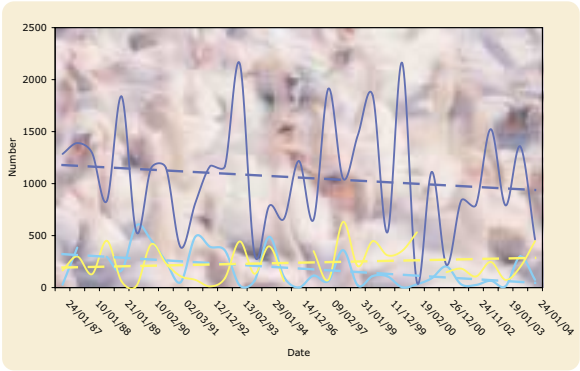


Figure 48 Counts of wading birds between 1987 and 2004 in Grouville Bay south (dark blue line, trend line dashed), and Grouville Bay north (light blue line trend line dashed) compared to St. Aubins Bay west (yellow line, trend line dashed). Although there are large inter-annual variations, first analysis shows a declining trend in both the Grouville Bay populations and an increasing trend in the St. Aubin's Bay population. There are concerns that disturbance from recreational activities like dog walking and kite surfing are affecting wader numbers by reducing their feeding efficiency.
Source: Unpublished Data collected by the Ornithology Section, La Société Jersiaise.

The Marine Protection Zone extends from Mean High Water to the territorial limits and ensures the sustainable use of the Island's marine environment because within this zone there is a presumption against all developments except those which are essential for navigation, access to water, fishing and fish farming and coastal defence. Where permitted, development should not materially harm the amenities, character or ecological balance of the area because of its construction disturbance, siting, scale, form, appearance, materials, noise or emissions.

The Ramsar Convention

This is an international agreement on the conservation of wetlands of international importance especially as waterfowl habitat and is one of many multilateral environmental agreements whose ratification has been extended to Jersey (Figure 48).

Worldwide there are 138 contracting parties who have designated 1,327 wetland sites with a total area of 112 million hectares. In Jersey the south-east coast from La Collette to Gorey has been designated as a wetland site of international significance and is an excellent example of how Ramsar's policy of wise and sustainable use can work well. Under the Ramsar banner there have been no restrictions placed on existing practices and the ecology of the area has remained largely unchanged whilst it has strengthened our international profile and provided a real source of local pride. There has been no impact on traditional activities which can all be accommodated into the "wise use" description and we have benefited from the site acting as a significant attraction for tourism with many people taking advantage of the guided walks and tours of the area. A proposal to extend the Ramsar designation to the offshore reefs of the Ecrehous and Les Minquiers was accepted in September 2004. Encouraging as all this may seem, wetlands continue to be among the world's most threatened ecosystems, owing mainly to ongoing drainage, conversion, pollution and over-exploitation of their resources. To that list Jersey can add land reclamation. Ramsar has given international recognition to Jersey's marine wetlands but it is the task of the community at large to ensure its future.

Marine Sites of Special Interest

The Environment and Public Services Committee have pledged to safeguard and help manage the most valuable marine environments by designating them as Marine Sites of Special Interest. Designation would only occur in consultation with other Committees, agencies and stakeholders.

A Coastal Zone Management Strategy

The Coastal Zone includes the terrestrial parts of the Island having a direct influence on the shores, the inter-tidal areas and the waters out to the limits of the Marine Protection Zone. The need for an integrated coastal zone management strategy has long been recognised by the Environment Department in order to realise fully the purposes of the Marine Protection Zone (Island Plan Policy M2). This has been initiated in the St. Ouen's Bay Planning Framework and in the Ramsar designation of the south-east coast. An integrated coastal zone management strategy will be produced by the Environment Department in 2005. Implicit to the Committee's development of such a strategy is a comprehensive consultation process with local stakeholders.

5.10 Land management regimes (Perspective 10)

5.9.6 Monitoring the biodiversity of Jersey's natural and semi-natural habitats (Perspective 9)

As part of 'State of the Environment Reporting' the Environment Department will be reporting on the following issues:

Headline Issue	Indicator measures
29. Terrestrial site quality	■ Habitat condition - proportion of sites achieving favourable status ■ Status of indicator species (birds & butterflies)across a variety of habitats Island wide
30. Success of measures to sustain biodiversity	■ % of sites owned by States / managed by States for nature conservation ■ % of owned sites under management that are monitored ■ % of owned, monitored and managed sites in favourable condition ■ Success of management techniques, % of passed sites according to objectives set for desired condition
31. Habitat quality of inter-tidal zone	■ Biotope quality of the inter-tidal zone including Ramsar site ■ Index of over-wintering wading birds including Ramsar site ■ Heavy metal concentrations in shellfish and algae ■ Quality and extent of seagrass beds

The States of Jersey Strategic Plan 2005-2010 under the heading 'Traditional landscapes and urban issues', pledges to **'protect and promote Jersey's environment as one of its most important assets'** and the achievement of this will be measured by ' the withdrawal of production-led subsidies for agriculture; the development of environmental improvement and rural enterprise initiatives; diversified land-use which ensures protection of green-land; an increase in the proportion of publicly accessible lands'.

5.10.1 Changing agricultural practices

Despite the decline in the scale and nature of the agricultural industry it is widely accepted that agricultural land should retain a high degree of protection as a major part of the Island's economic countryside resource. The Island Plan 2002, gives clear 'safeguarding' of farmland and the principles are as follows :-

- maintain and enhance the quality, character, diversity and distinctiveness of the Island landscape and its contributory features, natural and cultural;
- safeguard, sustain and enrich the diverse biology of Island flora and fauna through sound environmental management;
- protect agricultural land and encourage a sustainable diverse and non-polluting agricultural industry which, in turn, helps manage the environment, creates employment and supplies high quality produce;
- ensure the long-term, sustainable use of natural resources;

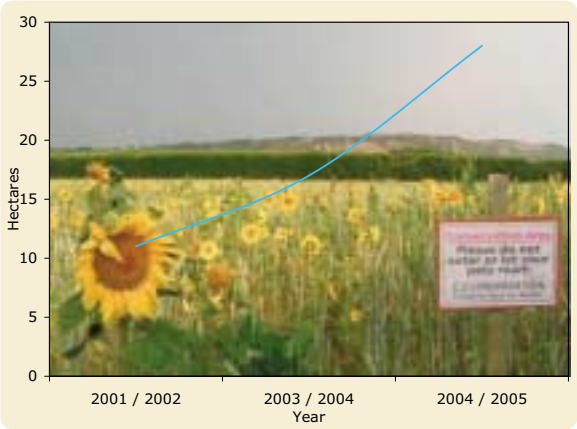


Figure 49 The increase in area under conservation crops over the three years of the project to date.
Source: Unpublished data, Common Sense Conservation, 2004.

- avoid potential pollution through controls and safeguards;
- support and provide communities with improved access to jobs, services and housing;
- develop a strong foundation of opportunity and enterprise through economic diversification;
- safeguard and interpret Island resources of archaeological and cultural significance;
- create a rewarding setting for outdoor recreation and tourism through improved management of access, facilities, information, and rural attractions;
- accommodate the pressures for development and other activities through the wise and sustainable use of rural land and buildings.

In addition to polices set out in the Island Plan 2002 the protection of agricultural land is achieved through a number of methods including the Planning and Building (Jersey) Law 1964 (as amended), the Agricultural Land (Control of Sales and Leases) (Jersey) Law 1974 and the Protection of Agricultural Land (Jersey) Law 1964. These policies and legislation are designed to keep land in agricultural use and so can hold down rental values of land to the benefit of that sector but the Committee can permit change of use at their discretion. It is recognised that these regulations need to be reviewed along with others such as the Agriculture Marketing (Jersey) Law, 1953 to ensure that they are still appropriate and that they are not stifling more economically attractive uses of land.

An example of recent environmental gains in fields that are not agriculturally viable in today's markets is the planting of 'wildlife' or 'conservation' crops. This low impact use allows the land to remain viable for agricultural use in the long-term should the agricultural industry need to expand once again (Figure 49). However, the planting of crops recommended to attract seed-eating birds or certain invertebrates means that monitoring is beginning to detect an increase in biodiversity in these fields.

5.10.2 A Strategic Development Plan for the rural economy

The States Strategic Plan 2005-2010 jointly charges the Environment & Public Services and the Economic Development Committees with a range of tasks that collectively amount to a strategic development plan for the rural economy. These tasks are nested within an overall States plan to grow the Island's economy and to nurture and manage its important natural assets. Work is currently underway to deliver a rural recovery plan by 2006. The strategy is likely to take shape around a set of themes for the future. These are :

- Rural enterprise and diversification
- Modernisation and meeting standards
- Safeguarding our important natural assets
- Reducing the role of government
- Creating greater public access to the countryside

The outcomes sought are :-

1. An increase in economic performance, a rural enterprise economy
2. Impacts of growth minimised, quality of life retained
3. More efficient, diversified and attractive land use
4. Better skilled and higher value jobs
5. Environmentally & economically sustainable farming
6. Increased public access
7. Increase in the size of outstanding character zones
8. Significant decrease in public subsidy payments
9. Greater self reliance in the agriculture sector
10. Re-alignment of policies for land use, land management and economic aid against these future objectives

5.10.3 Countryside stewardship

In other countries, countryside stewardship schemes have been introduced and funded to ensure that sufficient investment takes place in the countryside to maintain its intrinsic and aesthetic value and that agricultural land is managed to an agreed standard of environmental best practice. A Countryside Renewal Scheme was approved by the States as part of the Agriculture & Fisheries Committee Policy Report 2001 and was underpinned by the concept of 'stewardship in agriculture' as a means to ensure the wise use of rural resources. Despite States approval, the Countryside Renewal Scheme did not attract the necessary funding to support it and the implementation of the scheme has been stalled at present.

The list of components proposed in the Countryside Renewal Scheme 2004 is grouped within five strands as follows:-

- **Prevention of pollution and safe disposal of waste products:**
  It is critical to address these current threats to the local environment.
- **Protection and enhancement of biodiversity:**
  There is great potential to constructively use land that is not currently economically viable for this purpose although improvements in biodiversity can only be confirmed by rigorous monitoring.
- **Protection and enhancement of the visual attractiveness of the landscape:**
  We have seen that the visual appeal of the landscape, for both residents and visitors, is closely linked to its agricultural heritage.

- **Provision of greater access to the countryside for the public:**
  Appropriately planned public access allows greater enjoyment and ownership of the countryside resource and can draw pressure away from more ecologically sensitive areas.
- **Encouragement of less intensive farming systems:**
  Whilst there is work to be done in assuring that novel products have economically viable markets, given the local agricultural conditions diversification and extensive farming methods could deliver positive environmental benefits and merit further investigation.

Consideration has been given by the Environment Department to initially introducing a scaled down scheme focusing on access, hedgerows, slurry management and storage, energy audits and nitrate buffer zones. The advantages of this would be a public perception of obvious benefit, a rapid response in environmental terms and value for money, although the inclusion of support for diversification should remain as a way of utilising agricultural land not currently required for production. It is recognised that the scheme's proposals at this stage are specific in nature and funding would therefore be targeted fairly narrowly. Consideration should be given to also adopting the 'broad and shallow' approach to reward environmental stewardship across all agricultural land.

5.10.4 Soil

Despite being a critical resource for the Island's agricultural industry we know relatively little about it. Developing a soil map for the Island has been suggested but the resources are not available to move this forward. Soil analysis is undertaken by the Environment Department to enable farmers to administer fertilizers effectively. Similarly, analysis of Potato Cyst Nematode levels in the soil indicates the most appropriate course of action for the grower, which includes the use of nematicides if appropriate.

Soil conservation measures, such as uncultivated buffer zones, are suggested under the Countryside Renewal scheme and increased hedgerow planting provides a physical barrier to wind losses.

5.10.5 Monitoring land management regimes (Perspective 10)

As part of 'State of the Environment Reporting' the Environment Department will be reporting on the following issues:

Headline Issue	Indicator measures
32. Biodiversity in the agricultural environment	■ Area of land under organic farming methods and other stewardship schemes ■ Success of countryside renewal scheme proposed components e.g. % scheme adoption, % compliance achieved per component

5.11 The conservation status of key biological populations (Perspective 11)

Headline Issue	Indicator measures
32. Biodiversity in the agricultural environment	■ Status of indicator species (butterflies and farmland birds) on control sites, semi-natural sites and those in countryside renewal scheme
33. Pollution of agricultural systems	■ Pesticide import Levels ■ Crop pesticide residue levels ■ Incidence of crop pests

As Section 5.9 has shown, The Strategic Plan 2005-2010 has detailed the emphasis that should be placed protecting habitats and species.

5.11.1 Statutory protection of species and habitats

The Conservation of Wildlife (Jersey) Law 2000 is the first piece of legislation giving protection locally to listed animals. Plants are also soon to be scheduled. Although compliance is mainly achieved through education and advice, scrutiny of the development control process allows the needs of protected species to be accounted for as part of a planning application. All species of local bats are given full protection and under this Law all actions which may affect a bat or its roost must be referred to the Environment Department.

Habitats receive local protection under the Planning and Building (Jersey) Law 1964 (as amended), Site of Special Interest designation or international protection through the designation of sites such as the Ramsar site. In practice species conservation is primarily carried out by habitat management and improvement although short-term measures for species recovery can be implemented. Volume II of the Biodiversity Plan is in production and will lay out species Action Plans for key biological populations.

5.11.2 Managing fisheries

In 2000 following thirteen years of delicate and complicated negotiations, an international treaty between Britain and France was signed that defined the territorial waters and fishing limits around the Island (Figure 50).

'The Granville Bay Treaty' was negotiated by successive British, French and Jersey Governments, politicians and administrators and replaces a treaty dating back to 1839 when the agreement was geared towards regulating the then flourishing oyster fishery in the waters to the east and south of the Island at that time. Some of the key aspects of the Treaty include:-

- median line has been established that defines the boundary of Jersey's extended territorial sea.
- Fishing areas will be fixed precisely, and will be almost exclusively for French and Jersey vessels from the Granville Bay area.

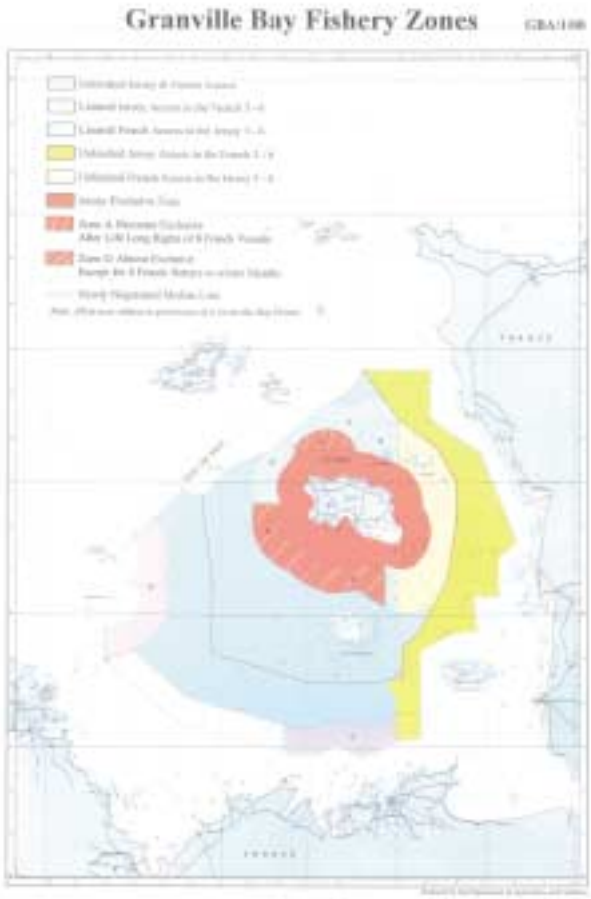


Figure 50 Chart showing the Granville Bay Fisheries Agreement
Source: Fisheries Protection, The Environment Department.

- All vessels engaged in commercial fishing will require an access permit. The number of these permits will be fixed by the Joint Management Committee, consisting of representatives from both Jersey and France, which will enforce a long-term sustainable strategy.
- West of the two degree longitude line, the exclusive three mile limit will be measured from low tide elevations rather than low water.
- There will be immediate exclusivity for Jersey boats in certain areas and future exclusivity in others once life-long rights have expired.
- A Joint Advisory Committee will be established formally, consisting of fishermen, administrators and scientists.

This complex treaty is still only the starting point for the further management of the area. The framework has been established for future management agreements between all parties with the establishment of both the Joint Management and Advisory Committees.

The Fisheries and Marine Resources Panel (formerly the Sea Fisheries Advisory Panel) was set up in the 1970s to address fishermen's concerns about over exploitation, neighbourhood agreements with the French and local conservation issues. From its formation the membership included professional and amateurs interested in the marine environment. The diverse membership aids the objectives of the panel in adopting the principles of an holistic approach to management and is in the spirit of the ecosystem approach to fisheries. This approach means integrated management of all human activities in the marine environment based on knowledge of ecosystem dynamics. This process aims to achieve the sustainable use of ecosystem goods and services and the maintenance of ecosystem integrity and a more practical implementation of this approach is in continuing development.

There are a number of measures that are taken to protect local fish stocks, for example, mobile fishing gear (*i.e.* trawling and dredging) is excluded from inshore areas including St. Aubin's Bay and the Ramsar site. Novel methods of marine resource protection are implemented *e.g.* escape gaps in parlour pots and closed seasons *e.g.* spider crab to allow stocks to regenerate. The Inspectorate Service also visits retail outlets to ensure that no undersize wet fish or shellfish are offered for sale and to make hotel and restaurant staff aware of the fishing regulations and reduce the likely outlets for illegally acquired fish. In September 2004 the UK government announced a unilateral ban on pair trawling for seabass effective immediately. However, the ban currently only affects UK registered vessels inside the limit so a significant reduction in cetacean deaths as a result of pair trawling is unlikely to be achieved since any vessels outside the (12mile) limit of the UK's waters can continue to fish as before.

5.11.3 Monitoring the conservation status key biological populations (Perspective 11)

As part of 'State of the Environment Reporting' the Environment Department will be reporting on the following issues:

5.12 The quality of life for Islanders (Perspective 12)

Headline Issue	Indicator measures
34. Biodiversity status	■ Scarce and threatened native species (as % of whole) ■ Protection of species by legislation ■ Protected species as % of threatened species ■ Status of non-indigenous invasive pests and diseases
35. Status of target species	■ Status of priority Species Action Plan species ■ Status of indicator / commercially important species

The Strategic Plan 2005-2010, Strategic Aim number Three is 'To Enhance the Quality of Life'. It acknowledges that

> **'a clean, healthy and safe environment enhances our quality of life and it is pledged that the States will support this aim through the development of comprehensive, long-term environmental and planning policies to minimise the impact of any population expansion, and through the introduction of further measures to ensure that the Island remains a low-crime society with all groups having access to services as required'.**

The Vision for Jersey sees the Island as a place where 'everyone is able to share in Island life and be valued for their contribution' and where 'individual parishes and local communities can thrive'. With regard to social and community facilities, the strategic objectives of the Island Plan 2002 include to:

- assist the development of facilities to meet health, education, social and community needs;
- assist the development of a vibrant social and cultural scene.

The 1987 Island Plan largely dealt with the development of social and community facilities on a case-by-case basis. During the Plan period there were a number of sizeable new education and health developments, including the Jersey College for Girls and its Preparatory School and the development of The Limes and Sandybrook nursing homes. The Island Plan 2002 outlines a general presumption in favour of social and community facilities. Such provision is dependent upon the availability of sites and premises through new development sites coming forward, land becoming available for redevelopment, land or premises being declared surplus to requirements and through extensions and conversions of existing premises.

5.12.1 Population

The Strategic Plan 2005-2010, Strategic Aim Two is **'to maintain a sustainable population'**. It is recognised that population issues are a major concern to Islanders. To maintain a balance between economic growth and the size of the resident population, the plan suggests that a compromise is required and so it proposes that:-

- Population growth be allowed only to support the economy;
- The aim should be for economic growth of 2% per annum in real terms;
- This should support full employment for local people;
- Sustainable growth in inward migration would be supported when:
  - It supports economic growth and increases tax revenue;
  - Skilled people are necessary to support industries that would employ local people.
- Numbers of low-wage immigrant workers should be kept to a minimum;
- The working population should be allowed to grow by no more than 1% per annum over the next 5 years.

In April 2004, The Policy and Resources Committee, Migration Policy Steering Group, launched a consultation paper that examined 'Monitoring And Regulation Of Migration'. The Steering Group believes that the States can develop and maintain an effective and integrated population policy by:

- Developing basic information on the whole resident population, to assist in planning and managing population changes and to help plan and provide adequate public services;
- Continuing to exert high level influence over the overall number of posts available within the economy in the best interests of the Island, and the setting a maximum number of non-local employees;
- Introducing a post licensing process as the principal mechanism of a population policy, to eventually replace 'permissive' access to accommodation, and ensuring access to accommodation is closely linked to individuals' employment and period of residence;
- Using information gathered in relation to migration, to provide intelligence for employment, skills and training programmes, and for the Housing Department and private sector housing providers on present and future accommodation requirements;
- If deemed desirable, revising the controls on the overall number and/or 'type' of persons granted access to employment and housing through modifying the criteria for gaining licences.

Whatever decisions are reached, it is recognised that there needs to be a measured approach to change with population management systems based on improved information on the structure and composition of the population and workforce combined with the available employment and housing resources. It is acknowledged that arrangements should be introduced in an effective and transparent manner, allowing sufficient consultation and gaining broad consensus at each stage. This approach will allow the States to consider each policy proposal on an individual basis, as part of a developing programme of coordinated policy across a broad range of initiatives. Detailed polices will be bought to the States once the results of the consultation process have been evaluated.

5.12.2 Transport

The Strategic Plan 2005-2010 outlines the Strategic Aim **'to develop an integrated transport strategy that shifts behaviour and cultural mindset with regard to car ownership and usage'**. The key objective is to develop a transport plan which promotes more sustainable travel by 2005.

Sustainable travel and transport plans must promote:

- decrease in the relative share of trips made by private car;
- increased level of car occupancy;
- increased choice about mode of travel;
- a safer road network;
- the attainment of recognised air quality standards and health benefits;
- more accessible and supported public transport system.

Since there is a clear link between land-use and travel, a key component of the new Island Plan was the need to address the requirements for movement in all its forms within, and to and from, Jersey. This document accepted that the present level of reliance on the private car cannot continue; road space, junction capacity and parking space cannot realistically be provided for the future demand for car travel. It was recognised that any restraint policy that is designed to encourage a change in mode of transport must be balanced by the need to maintain economic viability. Alternative modes must be viable, available, attractive and safe to use. Because private parking in St. Helier accommodates the majority of commuter trips, the level of congestion in itself is therefore unlikely to encourage a change in mode of transport. It was proposed that there would need to be a change in balance between private and public parking supply so that parking policy could become a stronger tool in the implementation of the transport policy. This would need to be achieved through development control policies and fiscal measures. In the United Kingdom, local authorities have started to introduce bus lanes and high occupancy vehicle lanes, however, the width of Jersey's roads prevents such innovation.

Clearly encouragement is needed to use of environmentally friendly modes of transport, such as walking and cycling and to integrate transport policy Island wide. It is recognised that public transport must play a greater role in Island life and opportunities to use public transport, taxis, cycling and walking must be improved. Bus travel should be convenient, comfortable and reasonably priced. There needs to be innovation in providing different types of services including central area feeder routes, high frequency routes, and dial-a-ride. There may be a need to give priority to buses over car traffic in the centre of St. Helier.

The State's objectives outlined in the Strategic Policy Review of 1995, '2000 & Beyond', in relation to traffic are:

- to reduce the detrimental impact of traffic on people's lives;
- to reduce the consumption of non-renewable energy;
- to provide adequate leisure facilities for residents to enjoy;
- to pursue policies providing for equality of opportunity, freedom from discrimination and freedom of information and to make better provision for those with disabilities.

5.12.3 Awareness and education

Education is critical to encourage people to change their behaviour or make informed choices. The Strategic Plan 2005-2010 recognises the need for education in order to achieve positive environmental benefits. For example, it pledges to **'Implement a framework for comprehensive pollution controls that comply with EU standards with the emphasis on education rather than legislation'**. This is hoped to be measured by a reduction in the general levels of pollution and a decrease in the number of pollution incidences and pollution-related health problems (*e.g.* asthma). We have already seen how, after the introduction of the Water Pollution (Jersey) Law 2000, the number of pollution incidents have declined. Undoubtedly there are complex reasons for this but one key factor must be raising awareness of the issues and best practice as outlined by the 'Water Made Clearer' Campaign led by the Environment Department.

Continued education and awareness programmes are necessary to keep the environment high on the agenda and promote local pride and responsibility in our natural resources. With budget cuts this it is increasingly difficult to fund from governmental resources, however the Strategic Plan 2005-2010 explicitly states the need to **'introduce schemes to encourage responsible behaviour towards the environment'**. A good example is the fundamental challenge faced in developing more sustainable systems of waste management through community involvement. Successfully preventing unnecessary waste and segregating more recyclable materials requires high levels of commitment from individuals and local businesses. For this to happen a greater understanding of the benefits of good practice in dealing with waste is required. The Public Services Department is committed to raising levels of knowledge and understanding on the subject of waste through a targeted programme of communications and events. In 2003 1,383 school children attended talks and site visits provided by the Department's Recycling Officer. A touring theatre group visited 19 Jersey schools in early 2004 presenting a waste awareness show and workshop.

Strategic Aim Six of the Strategic Plan 2005-2010 is 'To Promote Pride in Jersey' and the States pledge to **'encourage events and associations which celebrate and enhance the Island's environmental and contemporary culture and heritage'**. This fits well with the aesthetic beauty and rich biodiversity of Jersey which is recognised as an asset for tourism and as a rich recreational facility for the local community. A proportion of the community is aware of the social value and benefits derived from the natural environment and takes great interest in the issues involved, both globally and locally. In Jersey:

- During February, 2004, over 800 local people attended walks and talks organised by the Environment Department in support of Jersey's contribution to International Wetlands Day.
- The 2004 summer term provided some 600 primary school students and their teachers with an introduction to the marine environment and terrestrial natural history through field trips provided by the Environment Department.
- During 2004, in excess of 50 guided walks and talks were requested by the Tourism Department, the Scouting Association and a variety of clubs and associations.
- A strong presence at public events has enabled the Environment Department to meet the community, answer questions, disseminate information and gauge public perception of environmental issues.
- In 2003, Kempt Tower Visitor Centre recorded close to 6,000 visitors between May and September. Up until 2002 information within the centre had concentrated specifically on Les Mielles. Today it provides a much broader theme describing both the successes and the difficulties of sustaining the Island's biodiversity. It also introduces visitors to the ecology of Jersey's most important nature reserves and SSIs.
- In order to develop greater public awareness of nature reserves and Sites of Special Interest (SSI) easier access has been created with the provision of on-site interpretation panels describing the rich ecology of the areas.
- Encouraging substantial media coverage of both scientific research, the launching of a variety of themed weekends and the publication, at regular intervals, of the magazine 'Planet Jersey' has provided the community with many opportunities to keep abreast of current environmental issues.
- In November 2004, the Environment and Public Services Committee agreed to develop an interpretation centre in Gorey. This is planned to be opened in spring 2005.

5.12.4 Provide access to environmental information

Access to environmental information is important in order that informed debate can occur. The UNECE Convention on 'Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters' was adopted on 25th June 1998 in the Danish city of Aarhus at the Fourth Ministerial Conference in the 'Environment for Europe' process. The Aarhus Convention is a new kind of environmental agreement; it links environmental rights and human rights. It acknowledges that we owe an obligation to future generations and establishes that sustainable development can be achieved only through the involvement of all stakeholders. It links government accountability and environmental protection. It focuses on interactions between the public and public authorities in a democratic context and it is forging a new process for public participation in the negotiation and implementation of international agreements. The subject of the Aarhus Convention goes to the heart of the relationship between people and governments. The Convention is not only an environmental agreement; it is also a Convention about government accountability, transparency and responsiveness. The Aarhus Convention grants the public rights and imposes obligations

on parties and public authorities regarding access to information and public participation and access to justice.

The Jersey Environment Forum (JEF) was established by the Environment and Public Services Committee in June 2003 to bring together the views of all those who have a stake in Jersey's environment. Support for such a forum was confirmed at an open workshop held in December 2002. The Forum has broad scope and works to produce an independent viewpoint on policies. The JEF comprises 12 unpaid members appointed for a period of three years who are able to represent collectively the broad range of environmental issues that Jersey faces and who are willing to initiate appropriate dialogue to maintain links to the area of expertise they represent.

- In accord with the broad scope to be covered it consists of people with a wide interest in environmental issues capable of carrying the confidence of the area of expertise they represent and who maintain appropriate dialogue to achieve this.
- Agenda preparation and administration is managed by the officers of the Environment Department in liaison with the chairman. Discussion papers and background information are prepared for the meetings by officers, or other individuals or organisations as appropriate.
- When there is a need for more detailed appraisal or for some specialised research, a sub-group is established to complete the task. Sub-groups are composed of members of the Forum and, if necessary, co-opted specialists.
- Position papers are circulated as appropriate to facilitate wider consultation.
- An associated annual event is held to report on progress and to provide an occasion at which anyone with a real interest in the management of the environment is welcome.

5.12.5 Monitoring the quality of life for Islanders (Perspective 12)

As part of 'State of the Environment Reporting' the Environment Department will be reporting on the following issues:

Headline Issue	Indicator measures
36. Population	■ Population level / density ■ Estimates and projections by age group ■ Household estimates and projections
37. Housing	■ Level of social housing demand
38. Economic performance	■ Gross Domestic Product and GDP per head
39. Access to the Countryside	■ Compliance with countryside renewal scheme proposed components ■ Length of new / maintained footpaths
40. Environment and health	■ Number of visits made by Heath Protection Officers in relation to incidences of hearing damage, hygiene levels, noise and light pollution

6.0 Environmental priorities, key actions and guiding principles

6.1 Measuring progress

6.0 Environmental priorities, key actions and guiding principles

Jersey has a high quality of life sustained by a high quality environment. Our natural environment is to be envied; the Island supports unique local and visiting biodiversity and it comprises internationally important inter-tidal areas. Jersey is fortunate in having no legacy of industrial pollution however, there are gaps in our controls on water resources, air quality and contaminated land.

This report has outlined the many inter-connected pressures on Jersey's environment which have affected its condition. Whilst, perhaps, we cannot point to one single overarching threat to our quality of life locally it is the sum of the small things that can be equally damaging. As such there is little room for manoeuvre or for complacency. The Island is small and isolated and everything we do in the 117 square kilometres that is Jersey and its coast, impacts upon the environment that gives us some of our food, all of our water and a pleasant place to live surrounded by biodiversity that we enjoy and have a local and international responsibility to safeguard.

Section 5 has detailed our intention to closely monitor each of these 12 perspectives using 40 indictors devised using the *Pressure-State-Response* (P-S-R) model. We include a list of these indicators here and by carrying out monitoring within this P-S-R framework, we can assess over time and report back on whether our actions are improving Jersey's environment.

Monitoring climate change (Perspective 1)

1. Energy consumption	■ Final energy consumption (total and per household)
2. Trends in greenhouse gases & substances that deplete the ozone layer	■ CO_2 emissions by end users (industry, domestic, transport, services) ■ Total consumption of CFCs
3. Weather indexes	■ Average temperature, rainfall patterns, frequency of severe storms ■ Sea temperature, wave height
4. Phenological observations	■ Annual recording of the first date of key biological events
5. Policy response to pollutant levels	■ Compliance with key international standards e.g. Kyoto, Vienna and Montreal protocols and accepted industry guidelines
6. Success of policy instruments	■ Compliance of vehicle emissions with legislation

Monitoring climate change (Perspective 1)	
7. Road traffic	■ By type of vehicle ■ Road traffic - annual car mileage per capita ■ Mode of travel to work
8. Sea defences	■ Change in length / height of sea defences
Monitoring air quality (Perspective 2)	
9. Concentrations of air pollutants and compliance with international standards	■ Atmospheric pollutant levels: e.g. sulphur dioxide, nitrous oxides,volatile organic compounds, ground level ozone, particulates, radioactive substances ■ Origins of atmospheric pollutant levels by source e.g. crematorium flue particulate, municipal waste incinerator flue gas emissions, power station stack emissions ■ Measure compliance of above with international standards
10. Days where air pollution is moderate or higher	
11. Public health issues	■ Incidence of asthma and chronic heart disease
Monitoring Jersey's position in contributing to global biodiversity (Perspective 3)	
12. CITES	■ Number of regulated movements for conservation purposes as a proportion of movements relating to the exotic pet trade
13. Status of marine mammals	■ Cetacean by-catch ■ Marine mammals species diversity, distribution and abundance
14. Status of migratory birds	■ Bird indexes at key sites ■ Number of site protections through planning process
15. Status of bat populations	■ Number of roosts lost to development as a proportion of those protected by legislation ■ Species diversity and abundance at key foraging sites ■ Roost and hibernacula occupancy (natural and artificial)
16. Changes in land cover	■ % Land Use ■ Area of new development on green / brown zone ■ Number of developments in protected zones under the Island Plan 2002 e.g. marine protection zone, green zone, zone of outstanding character
17. Land use planning	■ Number of successful outcomes of environmental mitigation suggested through consultation on planning applications ■ % protected area of total area by ecosystem ■ Area of new habitat created under countryside renewal scheme
18. Protection of valuable features	■ Number of protected sites (SSIs / Ramsar sites/other designations) ■ Number of Tree Preservation Orders in the Tree Register
Monitoring contaminated land (Perspective 5)	
19. Area of land fill sites, mineral workings & quarries	
20. Contaminated land monitoring	■ Microbiology and chemical quality of key polluted sites

Monitoring fresh water quality and availability (Perspective 6)	
21. Water usage	■ Annual level per capita ■ Quantity at dipped sites ■ Abstractions and leakages ■ Volume desalinated water produced / number of days desalination plant run
22. Drinking & environmental water quality	■ Ground water quality - pesticides, microbiology, chemical) ■ Surface water- microbiological and chemical including BOD and nitrogen and phosphorous concentration ■ Biological water quality of surface waters
23. Anthropogenic inputs	■ Nitrate, pesticide and fertilizer imports / usage ■ % adoption of countryside renewal scheme waste reduction proposed components including manure slurry disposal facilities
24. Regulatory efficiency	■ Pollution incidents by type - chemical/ sewage/ oil/ industrial/ agricultural/ natural ■ Number of prosecutions and outcomes under the Water Pollution Law ■ Levels of compliance with conditions set on discharge permits/certificates ■ Proportion achievement of Water Quality Objectives
25. Access to appropriate water treatment facilities	■ Proportion of the population connected to sewage treatment and waste water treatment
Monitoring marine water quality (Perspective 7)	
26. Terrestrial inputs to marine waters	■ Outfall water quality (microbiology and chemical quality) ■ Radioactivity in the marine environment ■ Levels of compliance with EC Bathing Water Directive ■ Success of Jersey Harbours pollution reporting system
Monitoring waste management (Perspective 8)	
27. Waste arisings	■ Total waste arisings - solid and liquid ■ Solid waste arisings by sector ■ Household waste per capita
28. Controlling waste	■ Waste management - reused/recycled, composted, energy recovered or landfilled ■ Liquid waste receiving full (tertiary) treatment ■ Materials collected from household sources for recycling / reuse ■ Materials collected from industrial and commercial sources for recycling / reuse ■ Compliance with countryside renewal scheme proposed components for waste reduction
Monitoring The biodiversity of Jersey's natural and semi-natural habitats (Perspective 9)	
29. Terrestrial site quality	■ Habitat condition - proportion of sites achieving favourable status ■ Status of indicator species (birds & butterflies)across a variety of habitats Island wide
30. Success of measures to sustain biodiversity	■ % of sites owned by States / managed by States for nature conservation ■ % of owned sites under management that are monitored ■ % of owned, monitored and managed sites in favourable condition ■ Success of management techniques, % of passed sites according to objectives set for desired condition

Monitoring The biodiversity of Jersey's natural and semi-natural habitats (Perspective 9)	
31. Habitat quality of inter-tidal zone	■ Biotope quality of the inter-tidal zone including Ramsar site ■ Index of over-wintering wading birds including Ramsar site ■ Heavy metal concentrations in shellfish and algae ■ Quality and extent of seagrass beds
Monitoring land management regimes (Perspective 10)	
32. Biodiversity in the agricultural environment	■ Area of land under organic farming methods and other stewardship schemes ■ Success of countryside renewal scheme proposed components e.g. % scheme adoption, % compliance achieved per component ■ Status of indicator species (butterflies and farmland bird) on control sites, semi-natural sites and those in countryside renewal scheme
33. Pollution of agricultural systems	■ Pesticide import levels ■ Crop pesticide residue levels ■ Incidence of crop pests
Monitoring the conservation status of key biological populations (Perspective 11)	
34. Biodiversity status	■ Scarce and threatened native species (as % of whole) ■ Protection of species by legislation ■ Protected species as % of threatened species ■ Status of non-indigenous invasive pests and diseases
35. Status of target species	■ Status of priority Species Action Plan species ■ Status of indicator species
Monitoring the quality of life for Islanders (Perspective 12)	
36. Population	■ Population level / density ■ Estimates and projections by age group ■ Household estimates and projections
37. Housing	■ Level of social housing demand
38. Economic performance	■ Gross Domestic Product and GDP per head
39. Access to the Countryside	■ Compliance with countryside renewal scheme proposed components ■ Length of new / maintained footpaths
40. Environment and health	■ Number of visits made by Health Protection Officers in relation to incidents of hearing damage, hygiene levels, noise and light pollution

6.2 Our environmental priorities and key actions

Jersey has a high quality of life sustained by a good quality environment, but there is no room for complacency. We have identified the five key environmental priorities that arise from this report. In each case, we have summarised the main action points necessary to tackle these environmental priorities.

1. Climate change

Jersey has a high reliance on private cars for local transport and a dependence on fossil fuels for industrial and domestic uses contributes to local emissions of greenhouse gases.

In order to address this we must:-

i. Reduce our dependence on fossil fuels and introduce energy efficiency measures which will decrease the Island's contribution to climate change and its effects.

ii. Make further consideration of the potential for renewable energy.

iii. Prepare for the local effects of global climate change: different rainfall regimes, increased stormy weather and the impacts of this on our sea defences and flood prevention systems.

2. High levels of waste production

Excessive waste generation represents a misuse of resources and causes pollution. Jersey's municipal waste has risen by, on average, almost 3% for the last five years and our levels of recycling are not as good as have been shown possible in other European Countries. Emissions from our present incinerator fall well short of accepted agreed standards.

In order to address this, the Environment and Public Services Committee has developed a draft Waste Strategy which calls for:-

i. The urgent replacement of the inadequate waste disposal facility at Bellozanne

ii. Strict adherence be paid to internationally agreed standards in future waste management planning.

iii. Improvements in recycling rates.

3. Pressure on the quality and quantity of our water resources

The replenishment of local water resources is from rainfall - a finite resource. The quality of these waters is affected by diffuse pollution (such as nitrates from fertilizer applications and soakaways) or point source pollution (such as oil spillages from heating tanks). Around 90% of the Island's population receives their water from the public water supply which is predominately collected from streams.

In order to address this :-

i. Basic controls are necessary to ensure equitable distribution of this scarce resource. The draft Water Resources Law addresses this issue.

ii. We must continue to enforce measures that minimise the occurrence of pollution from point source or diffuse sources.

iii. We must continue to reduce the legacy of pollution. To do so, we need good land management practices to minimise any further contamination.

4. Transport

Jersey has the world's highest car ownership ratio as well as a dependence on air transport for external travel. This results in:

- local congestion and an associated reduction in economic efficiency
- high carbon dioxide emissions which contribute to the greenhouse effect
- localised air pollution that occasionally breaches internationally agreed standards and has risks to health
- the fragmentation of natural habitats by the road networks, airport and harbour development.

In order to address this:

i. The Environment and Public Services Committee is developing a Sustainable Travel and Transport Plan that will be delivered in 2005

ii. We will tackle congestion and encourage fuel efficient vehicles through fiscal mechanisms.

5. Changes in the countryside and our natural history

The Island is experiencing declines in the populations of common species such as toads, butterflies and farmland birds like goldfinches. To confirm the actual levels and explain the causes of these declines, we need robust, long-term scientific evidence.

Nevertheless, the main causes of change in marine and terrestrial biodiversity are likely to be:

a) Encroaching development; Development of previously undeveloped land causes a gradual sub-urbanisation of the countryside and coastal zone.

In order to address this we must:

i. Adhere to the policies guiding development control as laid out in the Jersey Island Plan 2002.

ii. Encourage landowners to preserve Jersey's natural habitats on their land; for example, wildlife friendly gardening helps prevent the fragmentation of natural habitats.

b) Change through habitat succession; although habitats change naturally, man's influence distorts nature's process and continuity.

In order to address this we must carefully manage naturally occurring habitat succession to maintain biodiversity.

c) Changes in the rural economy; traditional and long-term management of the countryside gave us today's familiar landscape. But economic pressures and changing practices have led to local water pollution and changes to our traditional methods of land management.

In order to address this we must re-engineer the rural economy to create a profitable working countryside with diverse rural activities that sustains our rural landscape and the habitats it supports.

6.3 Guiding principles

Our aim is to be a catalyst for change where this is most needed to address negative environmental trends and to help prepare the Island for a sustainable future. We have picked out six guiding principles that will help engender positive change:

1. Back ideals with actions

Provide firm, fair, transparent and effective statutory regulation, taking a precautionary approach. Use fiscal mechanisms to change behaviour if necessary.

2. Evaluate our progress

Carry out, and report on, effective environmental monitoring to chart our progress, identify priorities for action and carry out effective management planning to make wise and measured use of public money.

3. Work in partnership

Consult, communicate and establish open relationships between organisations, stakeholders and partners to make decisions, target funds and share expertise. This will enable Jersey as a whole to gain maximum social, economic and environmental benefits.

4. Educate and empower

The state of our environment is a collective responsibility. To help improve understanding of environmental issues and to foster better environmental practices in all walks of life, we will make environmental information easily accessible for individuals to assess the issues, participate in debate and make better informed personal choices and actions.

5. Use finite resources efficiently

We must manage the critical and limited resources of water, soil and land wisely to underpin economic success and health.

6. Act now - plan for the future

Consider the future consequences of our current polices and actions. We must plan to ensure that we pass on our environment to future generations in as good as, or better condition than it is now.

We all have the opportunity to help. Whilst the States of Jersey has pledged to take the lead guided by international obligations and local policies we are what we do. Only by taking account of our individual actions can we all play our part in improving the quality of Jersey's environment for now and the future. By reporting back on the 40 key indicators in a clear and concise way we will see if we are being successful.

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