Sustainable management of La Punta de La Móra in Tarragona

Puri Canals

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Engaged agents in the project

Proposal and management:
DEPANA

in agreement with:
The owner of "Mas Grimau" Estate, Mr. Agustí Peyra

Funding:
- European Community
- Generalitat de Catalunya
- Spanish Ministry of Environment
- Tarragona County Council
- DEPANA

Co-operators
- Gepec
- "Territori i Paisatge", Trust of Caixa de Catalunya

Budget and financing

Financial source	Amount in pesetas	%
European Union D.G. XI	49,853,500	50
Coast General Direct. Spanish Ministry Environ.	16,228,000	16.28
Environment Department Generalitat de Catalunya	16,000,000	16.05
Natural Environ.Direct. Agriculture Dept./Gen.Cat	8,000,000	8.02
Tarragona County Council	6,000,000	6.01
DEPANA	3,625,000	3.64
TOTAL BUDGET	**99,706,500**	**100**

Main guidelines of the project

- Proposed and managed by a NGO
- Private property in agreement with the owner
- Commitment of all public administrations involved by law over the site

Project timing

- 3 years
- starting 1st October 1998
- ending 31st September 2001

General aims

To achieve a sustainable management of a coastal site (terrestrial and marine) with unique habitats in Catalonia, and to improve and assure recovery of those habitats that have been altered.

Expected results

1. To solve the problems arising from excessive visitors pressure, and to repair and improve those habitats of community interest that have been severely damaged because of this.
2. To assure the conservation of interesting community habitats and avoid non-sustainable management and depletion of some natural marine resources (fishing, clam and shellfish collecting……).
3. To increase the general scientific knowledge of the site, especially about the less studied taxonomic groups.
4. To establish a reliable method of control and study about the qualitative and quantitative evolution of the different biotopes
5. To get the local population concerned about the importance of natural values of the site and to focus the interest of visitors on more educational subjects.
6. To promote the utmost possible upgrading of legal status so as to assure an effective and increased protection in the near future. A desirable degree would be "Partial Nature Reserve".

Main points of action to be developed

1. Adaptation of the walking zone for visitors coming to the site from the Platja Llarga access area, to Torre de la Móra in order to try to cut

down the unwanted effects of overvisiting, and try to divert it to less sensitive natural zones of the site, and also furnish them with information about the project.

2. Demarcation and marking of terrestrial and marine zones included in the protected area.

3. Recovery of zones that have become damaged by overwalking, mainly sand dunes and open woodland of mediterranean juniper.

4. Forest improvement works of all the zone, and building of a nursery for local plant species.

5. Permanent watching of the site.

6. Control of the biological pointers of quality level of the biotopes.

7. Opening of an office in Tarragona for administrative, managing, and public information purposes.

8. Educational activities and issuing of communication materials.

9. Permanent coordination both with owner and involved public administrations.

10. Providing regular and periodical information to the town media.

11. Regular flow of experiences between other similar natural sites and research centres.

Habitats at Punta de la Móra

(Appendix I of the Habitats Directive)

- Endemic *Limonium* communities (*Limonium gibertii*).
- Maritime sand dunes with *Crucianellion maritimae*.
- Open woodland of mediterranean juniper *Juniperetum lyciae*.
- Stone pine woods (*Pinus pinea*).
- Mediterranean woodland of *Oleo ceratonia* communities
- Permanently submerged communities of *Posidonia oceanica*.

The site has been proposed as a Special Area of Conservation of the Mediterranean region, named "Litoral Tarragoní", and included in the Natura 2000 Network of the European Community

Abstract of the project

LIFE project “Sustainable managing of the Punta de la Móra in Tarragona” is aimed at assuring protection of one of the last Mediteranean coastal areas of the Iberian peninsula, that has preserved till now important natural habitats of communitary interest. This protection should not interfere with traditional agricultural practices and social use of the area concerned. The site has been recently proposed as SAC (Special Areas for Conservation) and included in the European Union’s Natura 2000 Network.

Development of the project will be focused on three basic lines of action following the European Habitats Directive, and the Proposal of the 5th Programme of the European Community for Environment and Sustainable Development. These mainstreams are:

1. *In situ* actions aimed at improving the different natural systems (marine, coastal and woodland).
2. Communication, involvement and environmental education, mainly for the local population and visitors.
3. Public administration actions at all levels, to make easier any type of information exchange about managing and planning, between all the different concerned public administration offices.

In the first group of actions we can include:

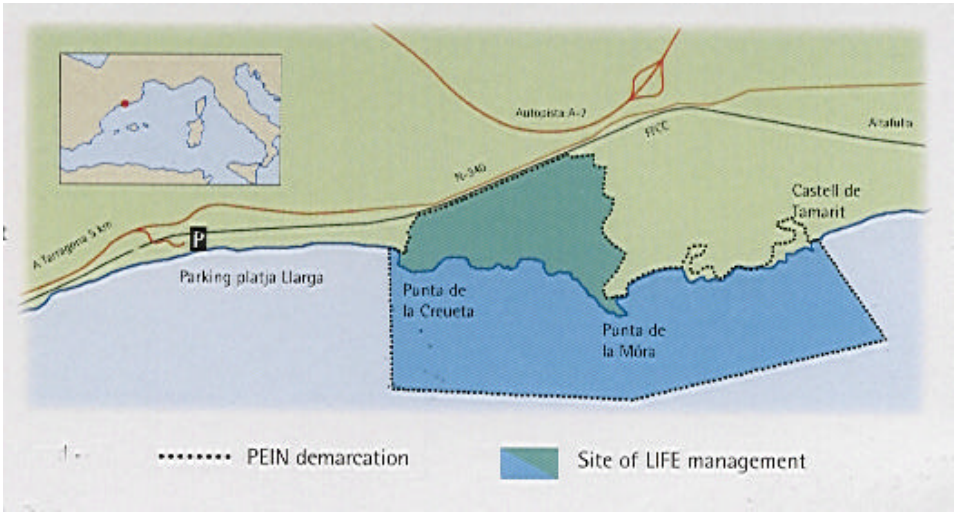
A. Buoy marking of the 20 metre sea-depth contour, with the main aim of protecting from anchor damage, and favouring natural restoration of submerged communities of *Posidonia*, and also the sand and rock benthic communities.
B. Designing and marking of a coastal path, to prevent damage to plant communities of the sea front (sand dunes with *Juniperus* and *Pinus pinea*, and *Chritmo-Limonietum*) included in the Habitats Directive.
C. Forestry management of woodland (*Olea ceratonia*) on the sea front, in order to repair eroded zones, reduce forest fire risks, and protect and increase the biodiversity.

In the second group we can include:

A. Designing and setting information boards at access points.
B. Planning and putting in practice environmental educational activities, with both the local population and visitors.
C. Organization of workshops and courses to exchange scientific knowledge and management experiences between similar sites in the European Union

The third group
will include any sort of actions intended at

encouraging similar activities in the field of public administration management, and also to increase the degree of legal protection of the site.



Basic guidelines of action

1. *In situ* actions to increase the quality of the different biotopes (marine, coastal, and woodland).

2. Diffusion, commitment, and environmental education activities, with the local population and visitors.

Actions with public administrations, in order to make easier the exchange of management and planning guidelines of the public organizations concerned in the zone.

Location map and part of information leaflet on the Project

The woodland

When land substratum near the coastline has appropiate conditions, it may be occupied by wood bearing plants, either trees or schrubs. Typically mediterranean woodlands are the coastal juniper open woods, and the pine-woods both of Aleppo and stone pines. These species are capable of growing on the rocky shore line, which is subjected to a constant and severe action of the seacoming winds and salt water. In response to those, tree growing on the sea facing cliffs takes a lie down bearing, as if it were a living green courtain.
Behind this line, and a bit more inland, growing also on thin rocky soils, some very characteristic plant associations can be found. Dense and thick, only a few meter high, are mainly kermes oak and dwarf fan palm communities, that here grow in a very good condition.
In the more secluded, shaded and cooler places, on deeper soil, also several plants, characteristic of the mediterranean evergreen oak woods can be found.

Squirrel
Sciurus vulgaris

ACTIONS ON WOODLAND

- Restoration of paths and accesses
- Prevention and watchful ness of forest fires
- Works in order to accelera te the natural evolutionary process towards a more mature woodland
- Restoration of damaged and overwalked areas
- Strengthening of declining species
- Fauna improvement

Sea lavender
Limonium gibertii

Audouin's gull
Larus audouinii

The coast

Plants growing on beaches may cause the accumulation of finests sands that later become sand dunes which are a peculiar habitat. Growing on these we can found some very well adapted species, as the marram grass and others. Those have very tough and long, horizontal growing rhizomes that firmly anchor them on such unsteady substratum.
Only a limited number of adapted plants are capable of growing on rocky shore cliffs. They are subjected to the harsh conditions arousing from sea water and saline environment. An endemic especies of sea lavender and rock samphire, locally named sea fennel, are both common on this habitat. Were the rock is altoghether under the sea waves, we can found a great amount of algae adapted to this environment, like the cistoseira upon which some fishes feed.
Permanently submerged sandy seabeds are locally colonized by the mediterranean especies of seaweeds posidonia and cymodocea, named locally "alguers". These submerged marine grasslands are of great biological interest because they stabilize the seabed, provide suitable refuges to great many different marine organisms and are spawning areas for coastal fishes.

ACTIONS ON THE COASTLINE

- Regulation of the fishing activities
- Regulation of boating and other nautical activities in the area
- Studies about shoreline dynamics
- Creation of signposted nature trails

Two banded seabream
Diplodus vulgaris

Effective site management planning

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Summary

Detailed management plans can be a wondrous sight to behold. If so, ignore them.

The point of a management plan is to structure thinking, balancing a number of conflicting pressures, and move towards achieving a series of long-term goals. Usually framed for biological or earth science interests, but equally suitable for visitor, educational and historic functions, plans must take full recognition of the political/practical/public use pressures as well – but do not have to agree with them. Erudite plans are usually intractable, and do not work. In practice, logically thought out plans, leavened with practicality, have the best chances of being used, and delivering meaningful data and outcomes in the long term.

For a plan to work requires a combination of good writing and reasoning, and use of clear practical/political acumen. Plans that do not get owned by decision makers and fund holders are known as dead plans. For a plan to work it must be implemented, involve monitoring and be continued. Non-working plans are also known as dead plans – and often involve dead species.

In the following few pages I outline the thinking process behind a plan, and how you can get on and do something useful.

1. Background

Planning is not new. Recognisable planning was going on more than a century ago, as foresters sought to maximise yields, and deliver the right blocks of trees at the right time.

The necessity for planning has never stopped. Rather, as conflicts for resources increase, it has become ever more necessary.

The key thing is that we should recognise what a plan is, what it isn't, and how it should be approached. It ultimately in the end must be

- DELIVERED and
- IMPLEMENTED

I would like to quote a few statements lifted from the 1983 Management Planning Handbook (NCC 1983):

- "for many years the mere existence of an agreed management plan was considered adequate for the purposes of managing a site. When fully completed, plans, often in the form of weighty scientific documents, dealt at length with the various attributes of sites…."

- "Little, if any, attempt was made to relate the requirement to the resource available…"

- "no formal procedures were laid down for monitoring progress in relation to objectives… Reviews were undertaken,… which served to enhance the value of the plan as a work of reference."

- "In terms of practical management the plans were at best used as broad guidelines to indicate areas where work should be concentrated"

The above points indicate why most plans have failed to work. What they omit are firm links between:

- The purpose or objectives, and
- The process or prescription

Essentially the planning process is <u>continuous and dynamic</u>

Much emphasis has been placed on the size of a plan – it is essentially *as long as it needs to be*. There is no merit in volume; rather it tends to cloud issues and waste resources. What the plan must do is to follow a clear logical flow – without it the next user cannot see how decisions were made, nor can the originator understand the issues that were in place much earlier if they were neither stated nor documented.

2. Plans – who needs them?

The answer is quite simple: all site managers, or anyone with responsibility for, or involved in, site and species management need plans. But surely, there are lots of cases where management happens without plans. Apparently so, but then these typically lack the detail/records or decisions and outcome from which

one can gain insight into whether the objectives were delivered or not. As they are typically undocumented and at best done with minimum of discussion, it is hard to know whether they really worked, or whether there were clear, objective lessons learnt.

The learning aspect of planning is a key issue. Conservation cannot afford to repeat mistakes in isolation – that is called local extinction, or worse.

3. The basic functions of a management plan

These include:

1. Providing a description of the site

A basic goal is providing a clear description of the site- its major attributes and what it is there that requires planning and action. One of the best ways to get to grips with the issues is not just mere enumeration or listing, but also the preparation of maps with the key features placed on them – dated.

2. Identifying the objectives of site management

This is, arguably, the most important function of the planning process. After all, unless you know your objectives, you cannot plan, and you certainly cannot monitor or work out whether you are succeeding or not. Hence the need to clearly state what you are trying to achieve, with an idea of timescales built in. Note: pie-in the-sky objectives will quickly get exposed.

3. Resolving conflicts and prioritising objectives

Occasionally, two objectives may appear of equal merit. Discussion needs to be undertaken, and ranking used (usually referring to differing levels of legal obligations for habitat A or species B). Usually, it is the thinking process of the plan that resolves these early issues.

4. Identify and describe the management/actions needed to achieve the objectives

The plan must identify not just the objective – but also the actions needed. In many cases, where intervention is identified as not being needed, the appropriate monitoring programme still needs identifying. *Monitoring* is an integral part of planning.

If activities are taken for which there was no identified objective, or no reference/rational can be made – then it is pointless undertaking it . Whims are expensive.

5. Identify the monitoring needed to assess the effectiveness of management

Especially if there is intervention management (doing something as a direct action), there will be a need in due time to see if that action has met that objective. Hence, did we achieve our hope/expectation – or does another process need to be set in train? *If a plan does not identify the need to monitor, then it is not a plan.*

6. Maintain the continuity of effective management

Contrary to rumour, site managers, or conservation directors are not immortal. When it is said that "they hold a complete management plan in their heads", that's the time to really worry. An overt management plan shows what is needed; it does not selectively add or remove things that do not fit, and it most certainly does not change jobs or retire. Instead, it is accessible to see what went before, and why.

7. Obtain resources

A plan is done for a group or authority. It identifies the basic minimum needed to remedy or continue a situation. Either way it involves resources. By setting out the programme of work – even as little as monitoring something – it bids for resources. It also sets out what might happen if resources are unavailable, or how much can be achieved, and with what consequence for denial or delay. As such, it is a powerful weapon for public accountability – especially when commitments/contributions to biodiversity obligations are concerned.

8. Communication

Issues/problems can be common – such as atoll or beach erosion, for which being able to share experience in a common format/against a common background is critical. "Sharing saves lives" is how one UK conservation organisation described information exchange.

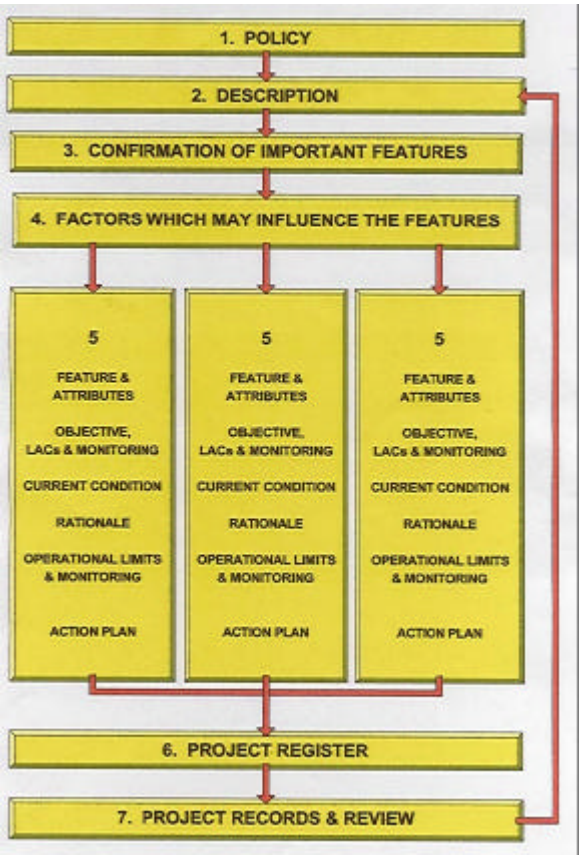
9. Show that management is effective and efficient

Plans always need to be assessed, and are no more immune from this in seeking efficiency that any other business process – only here we are in the conservation business

4. The Basic Structure

There is **no** exact structure that will fit all sites/species. There is a basic set of units that encapsulate an **approach** to planning. It is this mental process that I am concerned with, and that will form the basis for the practical session later this afternoon.

The contents of a plan could be long and exhausting – and appear almost scientific if compiled like a mantra, without thought. Looking at the points in section 3 above, it is clear that there is a **mental process**/ **approach** to be gone through as part of the producing of a plan. This can be shown simply in the Figure below.



In the following paragraphs I want to skip through the key stages, and let you begin to see that what you are doing is honing down from a wide list of possibilities to a largely coherent set of potentials and possible outcomes – and doing so in an externally recognisable way.

4.0 Plan Summary

The last bit of a plan to be completed, this encapsulates the key elements in the plan. If well written, it is tactically invaluable, spelling out the decisions and processes involved for those habitats/species or that territory. It can be the key to "selling" the plan to decision makers who have limited time.

4.1 Policy

The plan must reflect the policies of that Society/Group or Government. Stating these early on in the process allows recognition of context to objectives and statements possible in later sections.

4.2 Description

At its simplest it is a collation exercise, bringing together all relevant data, and placing these under a range of standard headings – part of the way in which communication between players can be achieved. Data need to be concise and easily assimilated – and gain from use of maps/diagrams.

One key conclusion is, if data are missing, this is grasped as an action in a later section, when a project will be undertaken to fill the gap in knowledge

4.3 Confirmation of important features

This starts to place the features that make that location important, in some sort of evaluated context. It distils down from the many components possibly described in 4.2, and also begins to consider the non-biological: earth science, landscape, research, public use and access.

The biological is placed against a series of standard biodiversity hangers – such as size, rarity, naturalness, and fragility, to check on the suitability of the components being open to multiple use – and to start the thinking in 4.4

By the end of this section one should have a clear idea of relative priorities, and responsibilities from the local through to the international. This starts the mental ball rolling on to constraints – which appear in 4.4

4.4 Factors which may influence the features

Having got as far as describing, and then ranking, the features of interest, and recognising that there may be a clear public-use role, it is time to consider the trends/factors/constraints that can impact on that/those features.

The key first stage is to recognise the owners/landholder's objectives, if these are not the same as the planning body. These need to be agreed or reconciled, mindful of possibly transcending legal limits to achieving their objectives: ideally they will follow your own long-term objectives.

Factors will include natural and anthropogenic factors, legal obligations and linked environmental issues. The last item may seem notionally confusing, but it is for example important for a particular species where it depends on the health/integrity of a much larger block of habitat being maintained.

For convenience in working through the pros and cons, the summary issues often work well as a column of plus points, and a column of negative points.

4.5 Feature objectives, limits and monitoring

In this section (refer back to the Figure) you start to work through the final stages that lead to the potentially getting-dirty "doing bit". This can come only after you are sure you know what you should be doing, and why. Note that you do this on the one-by-one basis for each of those features – such as a species/habitat/community – that were arrived at after reaching the end of 4.4

In setting an objective for the feature, there must be some *attribute* that is intrinsically inseparable from that feature and can be used to evaluate the success/failure in reaching that objective. For a species this will be something like number of breeding pairs/ individuals along a transect. For a habitat or community it might be extent, allied to an aspect of structure or composition

The *objective* describes where you want to be – and includes the upper and lower bounds when things start to get a little unhappy; these are the *limits of acceptable change (LACs)*. Recognising where these are, and why, is decided in principle in the evaluation stage of 4.3. Basically they are set so that within these bounds the feature will be expected to continue in the long-term. LACs are an early warning system – allowing action to be taken before it is too late.

As part of the process of assessing where you are with a particular feature, you need to use an appropriate *monitoring method* – one suited in type and style/frequency to your resources, but able to deliver a realistic assessment of change. Unless it does, you will waste your precious time and resources, and possibly that feature too!

The *rationale* acts basically as a double-check that you have recognised the keys affecting that feature, and are going to get on and then do something about it. This gets us to the real doing bit – the *Action Plan* .

For each feature you will have recognised factors causing change, and considered whether these are a problem or not. If the factors are not a problem, then merely monitor it – using a method that is open and valid, and keep good records. If they are a problem, then you work out a set of activities or *projects*. These describe what needs doing, by whom and when. They will also include the recording of the outcomes.

Essentially for the recurring 3-5 year time-scale that you might be working to in the management and planning for the species/site/territory, you will be setting up a programme of activities. If undertaken, and reasoned decisions made on the trends shown, you should not only have a working plan – but more importantly, be achieving your conservation and other objectives. After the first few years you will then start to see how some of the patterns have changed, and can begin to flesh out some of the bits of the plan that you were unhappy about.

Planning for the Gibraltar workshop on Effective Management Plans

1. Background

In the first part of the planning session (above) all participants will have quickly been introduced to the basic thinking process that underpins any planning exercise.

Amongst the key messages to get a plan that actually works was the need to produce reasoned trade-offs between different pressures, and the recognition of constraints to almost all objectives. In addition, there is a need to sift between what is desirable and what is practicable – whilst setting out a timetabled set of actions that would hopefully produce some of the objectives in the middle- to long-term.

For the purposes of the workshop, we will split into three different groups, each led by several local experts. The job of the participants (having selected one rapporteur per group) in each group is to tease out:

The key features in the area visited (4.2 in the talk) - a summary including these will be provided

Confirm the important features (4.3)- and determine their context, including:

- extent: how big?; large enough to be viable in the future?; is it in rapid decline?; is it within acceptable limits? – and how are these determined: biologically or politically?
- diversity: is the diversity of the habitat/ community indicative of stability or negative change?; are we worried?; is intervention needed – and will it be at the expense of another key feature?

- rarity: is it rare?; why is it surviving?; is it part of a seral change and can be left to disappear (a hint here is the status on the protected list for Gibraltar)?
- naturalness: is the feature natural, or the product of extensive modification?; will it change if pressures on it alter?; what might these be?

Add other parameters as you think fit, noting why you used them.

Identify the factors which may influence the important features noted in stage 2, on a one-by-one basis (4.4).

For **Windmill Hill Flats** these might include:
- Military needs and their impacts on the range of habitats/species allowed
- The limitations that ownership can place on management, and how individual species/habitats react to this
- The sensitivity of the plant communities to heavy use and fire
- Dealing with invasive and feral species – what place management?

For the **Upper Rock** these might include:
- The limits imposed by Protected Nature Reserve status
- The extent to which habitats should be managed – are the objectives clear?
- Balancing conservation interests with public use
- The role of public use, and acceptance of habitat change in highly used areas
- Interpretation – are the communities able to withstand current use levels?
- Changes in community structure – acceptable or driven by escapes ?

For the **Marine area** these might include:
- Potential limits from being in 2 conservation designations
- The plethora of extractive pressures on the resources to be listed – including fishing and sea bed raking, dolphin tours, over-exploitation of edible littoral species; recreational angling
- Practical law enforcement
- Development of the coast
- Pollution

For all three groups, use of the +/- tabulation might help

Having identified the main features, visited in concept at least the main constraints, the groups will now need to :

4.1 Set objectives for a sample of the features, with LACs (4.5)
4.2 Consider actions that may be needed for those features that need intervention management, and write a basic project or projects that would be needed to carry out the work. Note that any activity must contain a monitoring component
4.3 Set time scales – with good reasons – for the activities, and define quantifiable parameters for use in the monitoring work. Note that monitoring can be used in all aspects of the plan.
4.4 Consider whether the objectives and projects that you are setting are actually realisable within the potential finances/resources available. If not, set the work out according to practicability, and consistent with Gibraltar's legal obligations.

Summarise any issues that your group thinks needs to be done, but are constrained by existing procedures/ systems etc. Identify how these might be circumvented, and where the major decisions need to be taken to achieve the requisite change.

For each group, a short set of steps working through the practical exercise will be needed for inclusion in the post meeting documents. This IS a practical exercise.

It is hoped that all participants will have gained a better appreciation of issues, and the mental process accompanying plan consideration during the course of the exercise and the accompanying discussions.

Appended are the background notes on each study site (pregared by GONHS), followed by the reports of the brief workshops.

CALPE 2000 FIELD WORKSHOPS

The Marine Environment

Habitats and main impacts

The majority of what remains of Gibraltar's natural coastline is rocky shore with a small intertidal range typical of the Mediterranean. Most of the accessible rocky shoreline is exploited to some extent, mainly on a small scale (*e.g.* for fishing bait). Recreational angling is increasingly a problem and certainly creates disturbance which minimises the importance of the shoreline for waders. The sea cliffs remain relatively unspoilt, except near industrial activity.

The seabed drops rapidly from 0 to 700m and is generally sandy, but with a number of natural and artificial reefs, the latter having been created (by GONHS) to increase the diversity of species. Seabed species are varied and show the influence of the Mediterranean and Atlantic. They include endemic Nudibranchs.
Offshore, nutrient rich waters result in a diversity of marine life. Migratory fish move though the area, as do cetaceans, and common and striped dolphins calve in these waters.

Fishing with drift and seine nets and conch raking by Spaniards, despite being illegal, is allowed for political expediency and is a problem.
Some littoral invertebrates are protected by law as are all cetaceans, turtles and selected fish.

Species List

In addition to the species listed below are the birds. Some waders use the rocky shores, especially in winter (common sandpiper, turnstone, whimbrel, little egret) but are constantly disturbed by recreational anglers.

Thousands of seabirds occur on passage offshore. Yellow-legged gulls nest everywhere. Sea-caves on the east side are used by nesting western Mediterranean shags, as well as alpine swifts and pallid swifts, and as winter roosts by crag martins. There is a sizeable winter population of gannets and black headed gulls, with smaller numbers of razorbills and great cormorants.

PHYLLUM: MOLLUSCA
CLASS: GASTROPODA

Haliotis lamellosa
Diadora apertura
Calliostoma conulum
Gibbula varia
Gibbula richardii
Gibbula cineraria
Gibbula magus
Monodonta turbinata
Patella caerulea
Patella vulgata
Patella rustica
Patella ferruginea
Melaraphe neritoides
Nodilittorea punctata
Bittium reticulatum
Vermetus gigas
Thais haemastoma
Ocinebrinia edwardsi
Mitra ebenus
Pyrene maldonadoi
Siphonaria pectinata
Onchidella celtica
Haliotis tuberculata
Turbo rugosus
Spurilla neapolitana
Herria costai
Erodonia viridis
Thuridilla splendida
Peltodoris atromaculata
Flabellina affinis
Cerithium vulgatum
Aporrhais pespelecani
Zizyphinus granulatus
Turritella communis
Scala clahtrus
Vermetus gigas
Pisania maculosa
Crepidula formicata
Conus mediterraneus
Murex erinaceus
Murex trianchus
Murex brandaris
Capulus hungaricus
Dolium galea
Clathrus clathrus
Ranella gigantea
Cassidaria echinophora
Cassidaria tyrrhena
Natica hebraea
Cypraea pyrum
Cypraea lacrimalis
Nassa reticulata
Nassa variabilis
Tritonium nodiferum
Aplysia punctata
Aplysia fasciata
Jorunna tormentosa
Falio dubia
Elysia viridis

CLASS: POLYPLACOPHORA

Chiton olivaceus
Callochiton achatinus
Acanthochiton communis

CLASS: CEPHALOPODA

Allotheutis sublata
Loligo vulgaris
Sepia officinalis
Eledone aldrovandii
Eledone moschata
Sepiola randoletti
Ptodarodes sagittatus
Octupus vulgaris

CLASS: BIVALVIA

Mytilus galloprovincialis
Mytilus edulis
Perna picta
Musculus discors
Chlamys varia
Anomia ephipphium
Cardita calcyculata
Chlamys opercularis
Nucula nucleus
Pinna rudis
Pinna squamosa
Pinna nobilis
Lithophaga lithophaga

Lima lima
Lima hians
Spondylus gaederopus
Venus verrucosa
Verus casina
Cytherea chione
Notrius irus
Donax vittatus
Donax trunculus
Mactra glauca
Tellina tenuis
Tellina planata
Tellina distorta
Tellina crassa
Scobicularia plana
Solecurtus strigilatus
Ensis siliqua
Pharrus legumen
Teredo navalis
Lutraria lutraria
Tapes descussatus
Meretrix clione
Pholas dactylus
Mactra corallina

CLASS: HOLOTHURIOIDEA

Cucumaria planci
Holothuria forskali
Stichopus realis

PHYLLUM: ARTHROPODA

CLASS: CRUSTACEA

Scalpellum scalpellum
Chthalamus stellatus
Chthalamus depressum
Chthalamus montagui
Balanus perforatus
Acasta spongitis
Blanus improvisus
Lepas anatifera

SUB-CLASS: MALAVOSTRACA

Palaemon elegans
Palaemon serratus
Galathea squamifera
Ligia oceanica
Diogenes pugilator
Nerociba bivalyata
Pagurus anachoretus
Sphaeroma serratum
Pilumnus hirtellus
Gammarus locusta
Pachygrapsus marmoratus
Xantho incisus

SUB-CLASS: MALOCOSTRACA

Squilla mantis
Talitrus saltator
Punnotheres pinnotheres
Inachus dorsettensis
Portunus corrugatus
Neptunus hastatus
Hippolyte prideauxiana
Maja verrucosa
Maja squinado
Eriphia spinifrons
Carcinus meanas
Calappa granulata
Galathea squamifera
Palinurus elephas
Eupagurus excavatus
Nephrops norvegicus
Penaeus kerathurus
Parapenaeus longirostris
Anilocra mediterranea
Scyllrides hatus
Scyllarus arctus
Eupagurus anachoretus
Plesiopenaeus edwardsianus
Hamurus gammrus

PHYLUM: TUNICATA

CLASS: ASCIDIACEA

Clarelina lepadiformis
Distomus variolosus
Didemnum candidum
Botryllus schlosseri
Botrylloides leachi

PHYLUM: PORIFERA

CLASS: DEMOSPONGIAE

Halichondria panicea
Hymeniacideon sanguinea
Dysidia fragilis
Spongia officinalis

PHYLUM: CNIDARIA

CLASS: ANTHOZOA

Vertillum cynomorium
Epizoanthus areaceus
Actinia equina
Actinia cari
Anemonia sulcata
Paranemonia cinerea
Anthopleura balli

Anthopleura rubripunctata
Cerianthus membranaceus
Parazoanthus axinellae
Condylactis aurantiaca
Binodactylis verrucosa
Sagartia troglodytes
Calliactis parasitica
Leptosamnia pruroti
Balanophyllia regia
Asteroides calycularis
Alcynium palmatum
Parerythropodium coralloides
Pteroides griseum
Eunicella carolinii
Eunicella verrucosa
Eunicella singularis
Paramuricea clavata
Corallium rubrum

PHYLUM: ANNELIDA

CLASS: POLYCHAETA

Exogone gemmifera
Nereis pelagica
Cabella paranina
Spirographis spallanzanii
Myxicola infundibulum
Hydroides norvegica
Pomatoceros triqueta
Filograna implexa
Spirorbis pagenstecheri
Spirorbis borealis
Protula intestinum
Serpula vermicularis

PHYLUM: ECHIURA

Bonellia viridis

PHYLUM: PLATYHELMINTHES

CLASS: TURBELLARIA

Thysanozoon brocchii

PHYLUM: BRYOZOA

CLASS: GYMNLAEMATA

Tubucellaria careoides
Margaretta cereoides
Myropora truncata
Frondipora reticulata
Pentapora fascialis
Retepora cellulosa
Schimospora armata
Flustra carbasea

PHYLUM: VERTEBRATA

CLASS: CHONDRICHTHYES

Isurus oxyrinchus
Carcharodon carchanas
Cetorhinus maximus
Alopias vulpinus
Scyliorhinus canicula
Scyliorhinus stellaris
Prionace glauca
Sphyrna zygaena
Torpedo torpedo
Torpedo marmorata
Torpedo nobilana
Latimeria chalumnae
Raja clavata
Raja alba
Raja batis
Dasyatus pastinaca
Myliobatis aquila
Squalus acanthias
Squalina squalina

CLASS: OSTEICHTHYES

Parapristipoma octolineatum
Sprattus sprattus
Sardinus pilchardus
Engraulis encrasicholus
Anguilla anguilla
Muraena helena
Conger conger
Belone belone
Cypsilurus heteruras
Hippocampus hippocampus
Nerphis lumbriciformis
Syngnathus abaster
Syngnathus typhle
Syngnathus acus
Zeus faber
Phyraena sphayraena
Atherina presbyter
Chelon labrosus
Liza ramada
Dicentrarchus labrax
Epinephelus alexandrinus
Serranus cabrilla
Serranus scriba
Serranus hepahis
Epinephelus guaza
Anthias anthias
Puntazzo puntazzo
Diplodus vulgaris
Diplodus cernius
Pagnus pagnus

Oblada melanura
Dentex dentex
Pagellus erythrinus
Pagellus bogaraveo
Spanus auratus
Pagellus acarne
Lithognathus normyrus
Diplodus annularis
Boops salpa
Maena chyselis
Maena maena
Mullus surmulehis
Mullus barbatus
Argyrosomus regium
Sciaenia umbra
Unbrina cirrosa
Pomatomus saltator
Trachurus hachurus
Trachurus mediterraneus
Seriola dumertii
Naucrates ductor
Lichia amia
Campogramma vadigo
Trachonitus glaucus
Coryphaena hippurus
Brama brama
Chromis chromis
Labrus mixtus
Labrus bergylta
Crenilabrus mediterraneus
Crenilabrus ocellatus
Crenilabrus melops
Crenilabrus cinereus
Crenilabrus quinquemaculatus
Crenilabrus scina
Coris julis
Thalassoma pavo
Euscanus cretensis
Trachninus draco
Trachinus vipera
Uranoscopus scaber
Scomber scombrus
Scomber japonicus
Sarda sarda
Thunnus thynnus
Thunnus alalunga
Auxus thazard
Euthynnus alleteratus
Crenilabrus finca
Labrus merula
Xiphias gladius
Polyprion americanum
Callionymus lyra
Blennius gattugine
Blenius pavo
Blennius tentacularis
Blennius sphinx
Blennius canevae
Blennius rouxi
Blennius trigloides
Tripterygion tripteronotus
Gobius bucchichii
Gobius paganellus
Pomatoschishes microps
Trigla lyra
Trigla lucerna
Eutrigla gurnardus
Dactylopterus volitans
Scorpaena porca
Scorpaena scrofa
Scorpaena notrata
Solea solea
Remora remora
Mola mola
Lepadogaster lepadogaster
Lophias psiattorius
Spondyliosoma canthanus
Apogon imberbis
Macrohamphosus scolopax
Capros aber
Balistes carolinensis
Onos tricliratus
Mugil auratus

CLASS: REPTILIA

Dermochelys coriacea
Caretta caretta
Chelonia mydas

CLASS: MAMMALIA

Physeter catodon
Delphinus delphis
Stenella coeruleoalba
Grampus griseus
Tursiops truncatus
Orcinus orca
Globicephala melaena
Globicephala macrorhynchus
Balaena glacialis
Diplodus bellottii

ALGAE

Derbesia lamourouxi
Udotea pectiolata
Halmimeda tuna
Codium tomentosum
Codium bursa
Ralfsia verrucosa
Punctaria latifolia
Petalonia fascia
Cutleria multifida
Sporochnus pedunculatus
Halopteris filicina
Dictyota dichotoma
Padina pavonia
Fucus spiralis

Fucus serratus
Asparagopsis armata
Falkenbergia rufolanosa
Hypnea musciformis
Peysonnelia squamaria
Hildenbrandia rubra
Corallina elongata
Phymatolithon calcareum
Liththamnion fruticulosum
Lichinia pygmaea
Nitophyllum punctatum

Windmill Hill Flats

Habitats and main impacts

The main characteristic of this site is the fact that it is flat. It contains a combination of pseudosteppe (open habitat), with areas of low scrub (garrigue) and higher maquis. There is an artificial pond within the site. Military training creates disturbance to vegetated areas and probably prevents the establishment of some bird species that attempt to nest. These have included corn bunting and black-eared wheatear. The site holds many plants not found elsewhere in Gibraltar. Introduced invasive plants are smothering some areas of natural vegetation.

It is one of the sites where attempts are being made to re-establish the Gibraltar Campion in the wild. During migration periods it holds a large number and variety of grounded migrants. It holds small populations of wintering birds. Feral cats are a problem for rabbits and the Barbary partridge which nests there.

Selected species

PLANTS
Main shrub species:
Olea europea
Calicotome villosa
Genista linifolia
Pistacia lentiscus

Ground cover:
Gramineae
Asteriscus maritimus
Carpobrotus edulis (introduced invasive succulent)
Dittrichia viscose
Oxalis pes-caprae (introduced)
Pennisetum clandestinum (introduced invasive grass)

Other species:
Colchicum lusitanicum
Crocus salzmanii
Ferula tingitana
Foeniculum vulgaris
Iberis gibraltarica
Mantisalca salmantica
Narcissus papyraceus
Salvia verbenaca
Scilla peruviana

REPTILES & AMPHIBIANS:
Rana perezi (introduced in pond) Spanish marsh frog
Coluber hippocrepis Horseshoe whipsnake
Lacerta lepida Ocellated lizard (part of re-introduction programme)
Mauremys caspica European pond terrapin (introduced in pond)
Podarcis hispanica Iberian wall lizard
Tarentola mauritanica Moorish gecko.

MAMMALS
Oryctolagus cunniculus Rabbit

BIRDS
Nesting:
Alectrois barbara Barbary partridge
Cisticola juncidis Fan-tailed warbler
Falco tinnunculus Kestrel
Sturnus unicolor Spotless starling
Sylvia melanocephala Sardinian warbler

Wintering:
Carduelis carduelis Goldfinch
Emberiza cia Rock bunting
Galerida cristata Crested lark
Galerida theklae Thekla lark
Motacilla alba White wagtail
Motacilla cinerea Grey wagtail
Phoenicurus ochruros Black redstart
Saxicola torquata Stonechat

Many more species of bird occur on passage.

The Upper Rock

Habitats and main impacts

The Upper Rock is mainly vegetated by high maquis, about 2-3m tall, with some areas of lower scrub to 1m and clearings more or less well managed as firebreaks. These firebreaks and some natural open screes maintain the diversity of plants (although many have been lost through seral succession) and provide the main feeding sites for the Barbary partridge and rabbits (considered desirable in view of Gibraltar's poor native mammal fauna). Invasive plants threaten this habitat.

There are cliffs and other rocky slopes which hold endemic plants. There are also cave and tunnels which contain dwindling bat roosts.

The semi-wild Barbary macaques inhabit the Upper Rock, preferring the more open habitats where they can cause great damage to plants through trampling, eating and by causing erosion. The yellow-legged gull nests in most habitats and is a predator on small birds and other animals. Feral cats and black rats abound.

There is great pressure on the Upper Rock from tourist traffic.

The Upper Rock is a nature Conservation Area under the Nature Protection Ordinance (1991).

Selected species

PLANTS

Trees:
Celtis australis
Laurus nobilis
Pinus halepensis
Pinus pinea
Calicotome villosa
Genista linifolia

Main shrub species:
Olea europea
Osyris quadripartita
Pistacia lentiscus
Rhamnus alaternus

Ground cover:
Acanthus mollis
Gramineae
Oxalis pes-caprae

Other species:
Cerastium gibraltaricum
Colchicum lusitanicum
Ferula tingitana
Foeniculum vulgaris
Gladiolus communis
Iberis gibraltarica
Narcissus papyraceus
Psoralea bituminosa
Saxifraga globulifera
Scilla peruviana

REPTILES:
Coluber hippocrepis Horseshoe whipsnake
Elaphe scalaris Ladder snake
Hemidactilus turcicus Turkish gecko
Malpolon monspessulanus Montpellier snake
Natrix natrix Grass snake
Podarcis hispanica Iberian wall lizard
Psammodromus algirus Algerian sand racer
Tarentola mauritanica Moorish gecko

MAMMALS:
Macaca sylvanus Barbary macaque
Miniopterus schreibersi Schreiber's bat
Oryctolagus cunniculus Rabbit
Rattus rattus frugivorus Black rat
Vulpes vulpes Red fox (probably extinct – reintroduction programme in preparation).

BIRDS
Nesting:
Alectrois barbara Barbary partridge
Falco tinnunculus Kestrel
Falco peregrinus Peregrine falcon
Larus cachinnans Yellow-legged gull
Turdus merula Blackbird
Monticola solitarius Blue rock thrush
Troglodytes troglodytes Wren
Parus caeruleus Blue tit
Sturnus unicolor Spotless starling
Sylvia melanocephala Sardinian warbler

Wintering:
Carduelis carduelis Goldfinch
Motacilla alba White wagtail
Motacilla cinerea Grey wagtail
Saxicola torquata Stonechat
Phoenicurus ochruros Black redstart
Turdus philomelos Song thrush
Erithacus rubecula Robin

Many more species of bird occur on passage.

Management Planning Field Workshops: Outline reports

edited by Tim Reed

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BACKGROUND

The workshops were undertaken in order to show how the potentially abstract notions discussed in considering management planning worked in practice. Prior to the practical sessions, the basics of planning were covered in outline. The basic aim/objective of the practical sessions was not to produce a set of "pure" plan components, but to expose participants to the approach, and to see how it might benefit their respective organisations. It was not expected that the groups would mirror each other in their results: some contained experienced planners; others were totally new to the concepts. The results reflect these levels of experience, but all showed clear signs of undergoing the basic thinking process that is management planning.

INTRODUCTION

Each group took an independent slant on the planning practical. Nonetheless, all went through the planning process, especially the thinking stages on the way to their outcomes. That all terms were not used consistently in no way took away from the achievement of the groups.

Each group had a guide who acted as repository of knowledge for the site, and provided a resume of issues at each location. The role of the catalysts was to help stimulate the process of questioning/ drawing out issues and setting objectives/identifying options for the group. The group's job, in turn, was to take the basic information and help to reach outcomes for each of the habitats/areas.

WORKSHOP 1. MARINE EDGE

Guide: Eric Shaw
Catalysts: Joseph Smith-Abbott
Tim Reed

The group took in 2 sites/features
a) Posidonia beds
b) Camp Bay

a) Posidonia Beds – the Feature

Issue
The beds near the newly extended revetment wall by the airstrip are, and have been, under threat.

After having suffered 60% loss in the last 3 years, 15% further loss is threatened.

Considerations:
Extent – 40% remains
Fragility – to extraction/burial/seabed mining. Fragile
Rarity – An EU Directive special Habitat. Patching found in Bay of Gibraltar.

Factors affecting Posidonia beds:
Legally protected:
- Laws (1991 Ordinance) not enforced

GONHS lobbying:
- Not being listened to
- Pollution from reclaimed area in Gibraltar
- Pollution from Spain across the bay

Could use Ramsar protection:
- Government scared of Ramsar implication. No long-term strategy for safeguard in place.
- No public support of Posidonia problems
- Offshore turbidity
- Porifera algae taking over in Spanish area.

Objectives:
Develop new Posidonia beds by changing seabed topography near new infill, along with current regime, to allow Posidonia regeneration.
Time scale 10-20 years

Activities
- Lobby Gibraltar Government to recognise need to sign Ramsar Convention to strengthen Posidonia protection: Time Scale + 5 years
- Funding for excavation work: Time scale 3 years
- Begin reseeding of new Posidonia plants: Time scale 3-5 years

Monitoring
- (Use existing French survey method)
- Map initial status in year one
- Monitor success in trail plots every year
- Monitor scale of colonisation every 2 years

Funding
Gibraltar Government – project to gain and sustain ££ - review annually

b) Camps Bay

Issue
To stop development of the Camp Bay beach area, and loss of offshore artificial reefs.

Feature
Offshore artificial reefs (sunken ships) placed at the edge of steeply sloped shelf with rich sea communities.

Considerations

Extent:	10 boats or 800 m length
Biodiversity:	richest area in Bay and as far as Malaga
Rarity:	supports species and communities unique to bay
Fragility:	robust
Public Use:	high diversity value and use

Factors affecting area

Rich biodiversity site	No alternative locations
Rich diving area	No sustained public profile
Potential vote winner	Closes off political avenues
Possible to safeguard legally	No obvious political gains
GONHS owns wrecks	Low concern for public

Objectives
Put in place legislative support for Camp Bay's protection by designating as marine Reserve in + 5 years

Activities
- Lobby Government on low risks for designation + 5 years
- Incorporate into policy planning as a safeguarded area
- Evaluate use and monetary value of existing use levels by divers over 3 year period
- Monitor public perception of the Camp Bay issue annually
- Represent better informed case after 3 years

Key constraint
Government awareness of cheapness of action, but not yet prepared to undertake change.

WORKSHOP 2. WINDMILL HILL FLATS

Guide:	Leslie Linares
Catalysts:	Colin Clubbe
	Madeleine Groves

The group approached the task by beginning with the compilation of the basic site description. This led to the derivation of the key features.

Key Features
- Flat Areas
  - West – dominated by invasives
  - East – more natural, less disturbed
- Rocky Scrub
- Steep rocks with endemics
- Artificial pond

Factors
MOD (owner)
- MOD short term views/non-consultation

Limited access
- Limited access – hard to monitor

Breeding & migrating birds
- Important for international obligations

Invasive plants
Feral plants
Natural processes
- succession

Reintroduction of priority species
- Lack of knowledge of priority species biology

Three species were considered. The group concentrated on *Silene tomentosa*

Silene tomentosa
- endemic to Gibraltar
- only 2 individuals
- not reproducing in the wild
- reproducing in the Botanic Gardens

Objective
To establish a viable population in the wild
a) Short term – establish life cycle + 5 years
b) Medium term – reintroduce within 10 years

Action Plan
1. Improve GONHS: MOD Conservation Committee Communication – provide written resumes of key agreements for new staff.
2. Inform MOD of presence/absence and location of Campion and other important species – using maps in particular.
3. Produce maps of species locations.
4. Produce information signs for recognising key species
5. Continue annual survey and, in particular, monitoring - recording individuals.
6. Investigate horticultural propagation techniques
7. Identify distinct projects needed that could be carried out as beneficial 6th Form projects in the local school

WORKSHOP 3. THE UPPER ROCK

The Upper Rock group took several different strands in their approach to planning, dispensing in part with the basic description, adopting the resume provided on the hand out.

Feature 1. The Apes

Background parameters that influenced the discussion

- The Macaques are potentially an artificial population
- They are viewed primarily as a heritage feature, secondly as a biological feature
- The population could expand rapidly, and is not limited to the Upper Rock
- The population is illegally fed. This has a series of risks:
  - disease (hepatitis A carrier)
  - aggression – within community and to humans

Constraints

- Provide annum income
- Income not retained by GONHS
- MOD support
- Expense of management
- Tourist Board manages apes - No?
- Animal welfare problems
  - obesity
  - diabetes
- Culling contentious
- No interpretation
- MOD confused

Objective

1. Maintain a healthy population of apes on the Upper Rock

- range
- timescale (*not stated*)

Prescription

- Eliminate animal/tourist interaction (*method ?)*
- Veterinary screening
- Control fecundity
- Inform visitors of health and population issues

2. "Allow controlled viewing by a million visitors per year"

- Create an enclosed and controlled area
- Enforce regulation
- Fund (hypothecation?)
- Educate public
- Provide interpretative facilities

Feature 2. Botany

Current issue

A relatively even aged scrub stand community

Objective

Establish a mosaic of different aged indigenous plant communities on the Upper Rock *(Timescale?)*

Constraints

Funding potential (entry); diverting funds to project MOD permission

Action Plan

- Establish current distribution and status *(scale ?)*
- Discuss mosaic options and agree viable structure *(timescale?)*
- Carry out process and mosaic creation
- Monitor success rate of process by using indicator species (*method?)*

Feature 3. Landscape feature of the Upper Rock

Description

Mosaic of heritage features and scrub

- heavily influenced by man
- natural communities fragile and unstable

Constraints

- Views
- Firebreaks
- Some access
- Lack of interpretation/signing
- Radio masts
- Fencing
- MOD - few paths and steps
- Limited access; no disabled access; poor roads and parking

Objective

To strike a balance between visitor enjoyment, preserving landscape and providing effective, but unobtrusive firebreaks

Action Plan

- Examine alternative ways of access e.g. cars at bottom and then shuttle bus *(method?)*
- Provide architectural interpretation (*methods?)*
- Minimise visually obtrusive fencing (*timescales*?)
- Regularise MOD dialogue

Success parameter/monitoring attributes

- Number of visitors and length of stay
- Visitor satisfaction survey

Feature 4 Fortifications – cultural/history

Policy
Roles for conservation, interpretation, education and fortification retention

Description
A matrix of built batteries, walls, tunnels and caves from C14 – C20
The heritage value ranges from unique to general, along with condition.

Objective
To provide supportive renovation opportunities/action at a series of key sites.

Constraints
- MOD
- Proposed developments
- Ill-defined timescales
- Private vehicles
- Pressure groups
- Poor quality of repairs; wrong mortars
- Funding

Action Plans *(timescales?)*

1. O'Hara's Battery
- WWII battery
- Need clear management and public access
- Good existing condition

Need
- Funding
- Expertise

To do
- Confirm ownership (*timescale?)*
- Evaluate condition *(methods?)*
- Gain funding
- Conservation strategy for medium/longer term

2. Charles 5th Wall
C15 wall
Good existing condition
Need
- Conservation and public awareness concerns
- funding
- Expertise

To do – as O'Hara's Battery

3. Tunnels
World War 2 MOD tunnels
- Condition and extent need clarifying
- Baseline information required

To do: as O'Hara's Battery

In conclusion
The built heritage needs better over-view and the development of a time-tabled strategy within which to produce and deliver the heritage for the future.

MANAGEMENT PLANNING WORKSHOP: OVERVIEW

Each of the groups approached their tasks with vigour. The approaches varied, but worked within the general constructs of the planning guidance.

Common problems met were:
1. Defining tight objectives
2. Expressing timescales
3. Recognising methods/methodologies which need to be used
4. Prioritising actions
5. Strategic steps for influencing key players, such as MOD/Government.

These problems (and the very limited time available to work through the examp les) not withstanding, the Planning Workshop met its basic aims: each of the groups achieved a good first step on the way to undertaking their own, individual, management plans.