

Software Solutions for the Environment

ESUG General Meeting 2019-04-23

Nick Casey, Anatrack



INTRODUCTION

I am the engineer for Anatrack and develop all the software.

I am what is known as a Full Stack Engineer which means that I can do all parts of an enterprise software project, coding in many programming languages, database management, front end design and hardware commissioning, though this now all virtualised on the Cloud. I do the software analysis, costing and system architecture, the build, release and support. I try to persuade others to do the testing: developers should not test their own products.

I live and work in Devon, in the west of England, and this is view from my office window.

QUALIFICATIONS

I went to Oxford University to study engineering science
Then went on to do a research degree in digital audio signal processing at York

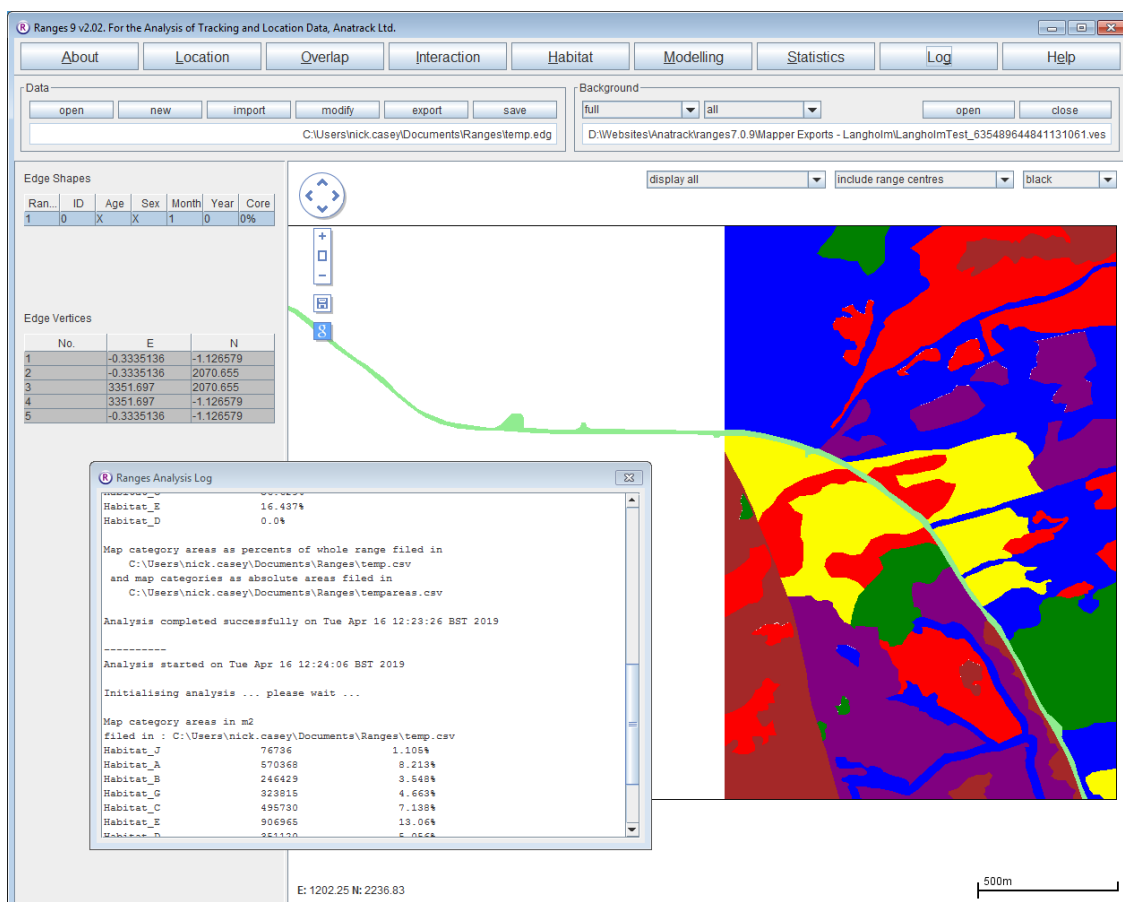
WORK EXPERIENCE

I have had many roles, developing audio analysis tools, document management systems, an advertising engine and lots of web applications. In the year of the millennium I helped build an early web site that builds web sites, more on which later.

WORKING FOR ANATRACK

I jumped at the chance of a job at Anatrack when Robert offered it. This would allow me to help save species while remaining hands on with software development.

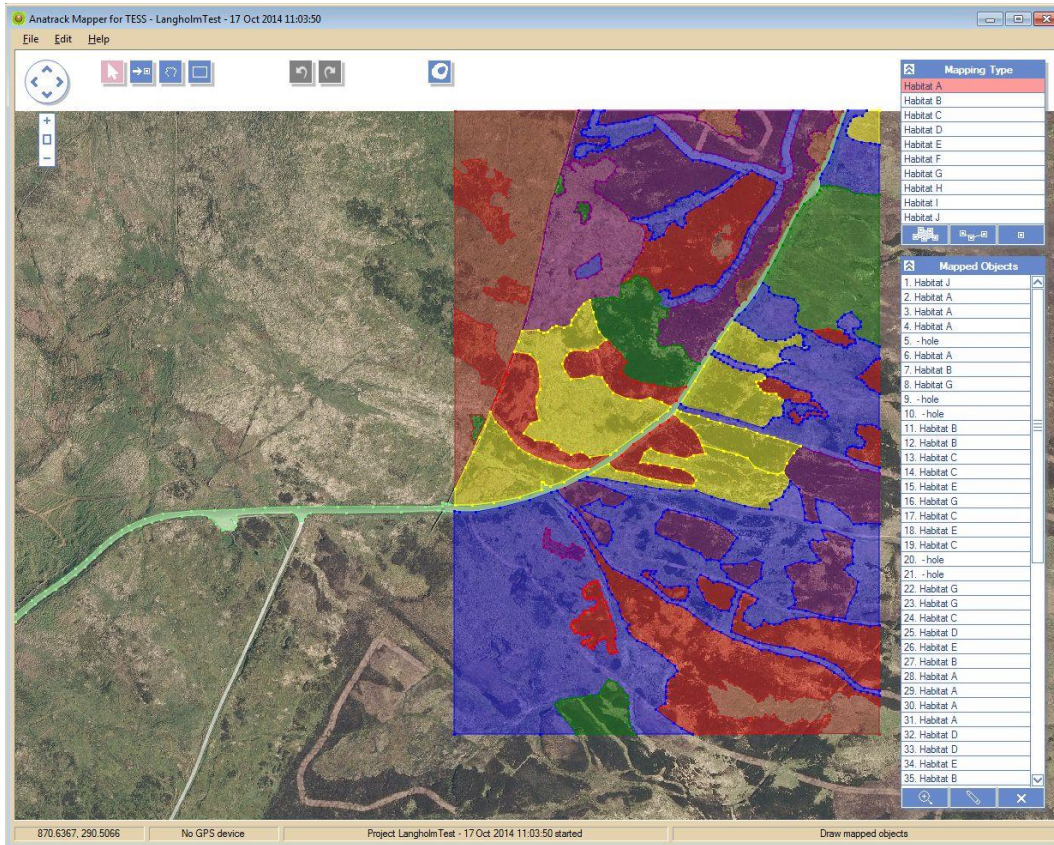
RANGES AND THE MAPPER



Anatrack's original product is Ranges which is a tool for animal researchers to analyse data received from tracking devices, radio or GPS tags, attached to animals.

Robert started developing Ranges in the 1980s and it is now in version 9, running on Windows and Apple Macs

Another early product was a species mapper for the TESS initiative. This consolidated our knowledge of mapping software, useful as there is a mapping element in nearly all our solutions.



All of Anatrack's other projects involve content management systems (which I might call CMSes), or web sites that build web sites, as mentioned before

NATURALLIANCE

We started with Naturalliance mark I, our first portal for sustainable use.

Logout | Logged in as COUNT Master User

Naturalliance Editor

Home | About | Topics | Habitats/Species | Survey | Donate | Contact Us

Topics

Home - Return to the editor home page
 Users - Create edit and suspend users
 Transactions - View user payments
 Topics - Create and edit topics
 Topic Subpages - Create and edit subpages
 Topic Links - Create and edit subpage links
 Habitat/Species Links - Create and edit habitat/species links
 Surveys - View survey results
 Translations - Translate pages and data
 Mapper - Mapper administration

Resize columns by clicking and dragging their edges. Click the New Topic button to create a new topic.

New Topic

Display Order	Name	Best Practice	Total Links	Suspended
1	Local Communication	yes	4	no
2	Restoring Nature	yes	0	no
3	Managing Aliens	yes	3	no
4	Gathering	yes	5	no
5	Farming	yes	10	no
6	Forestry	yes	4	no
7	Gardening	yes	2	no
8	Aquaculture	yes	1	no
9	Angling	yes	4	no
10	Hunting	yes	3	no

Total records: 20 Page 1 2

Edit Topic | Edit Best Practice | Move Up | Move Down

Site Map

Browse	Topics	Best Practice	Good Ideas	Models
Home	Local Communication	Local Communication	Local Communication	Farming
About	Restoring Nature	Restoring Nature	Gathering	Forestry
Topics	Managing Aliens	Managing Aliens	Farming	Aquaculture
Habitats/Species	Gathering	Gathering	Forestry	Angling
Login	Farming	Farming	Gardening	Reserve Management
Register	Forestry	Forestry	Watching	Government
Contact	Gardening	Gardening	Science	Community
	Aquaculture	Aquaculture		Science
	Angling	Angling		
	Hunting	Hunting		

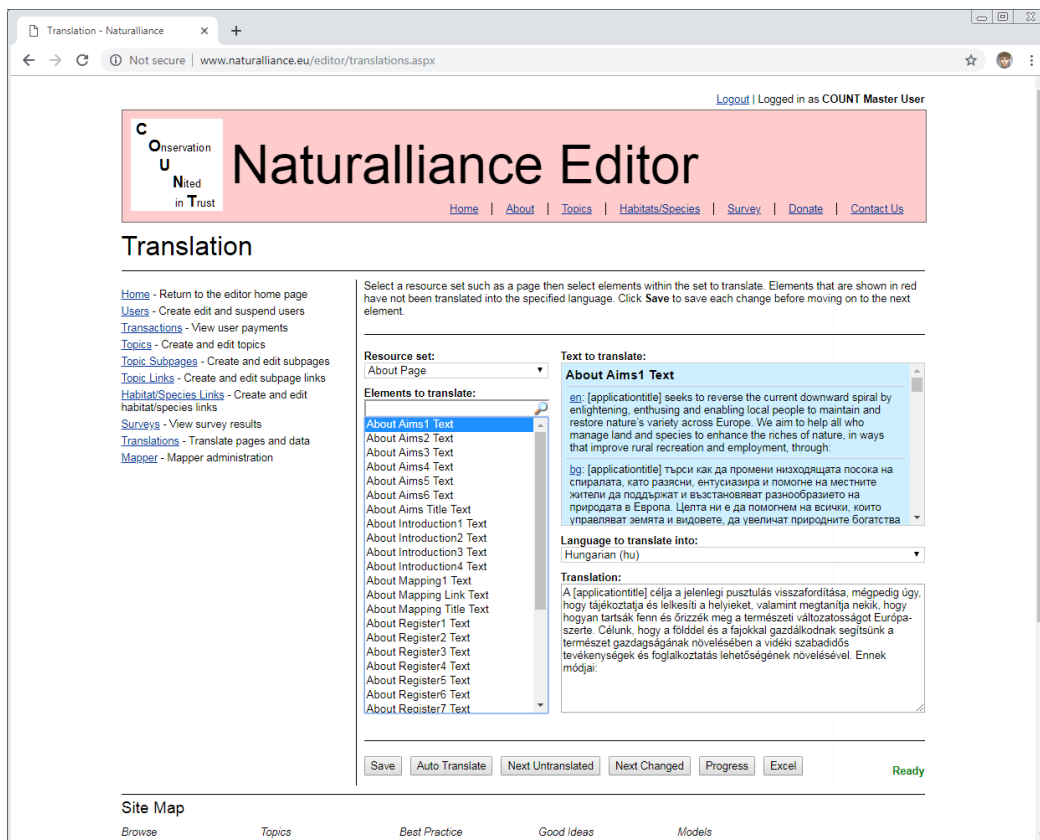
It consists of a backend, which allows site editors to login and edit the site content.

Pages on different subjects can be created, filled with text, images and links, and added to the menu for access

Importantly, there are tools in the backend to allow translation of the text into multiple languages

As they are working, the editors can view a preview of the site

and once the content is written and translated, the site can be published so that that it is visible to everyone on the Web



We contracted professional graphic design for Naturalliance, and as such is, or at least was, the prettiest of our web sites to date

but style trends change quickly on the Web and after ten years it is looking a little old fashioned

these days we stick to Google- and Wikipedia-inspired black on white with standard fonts

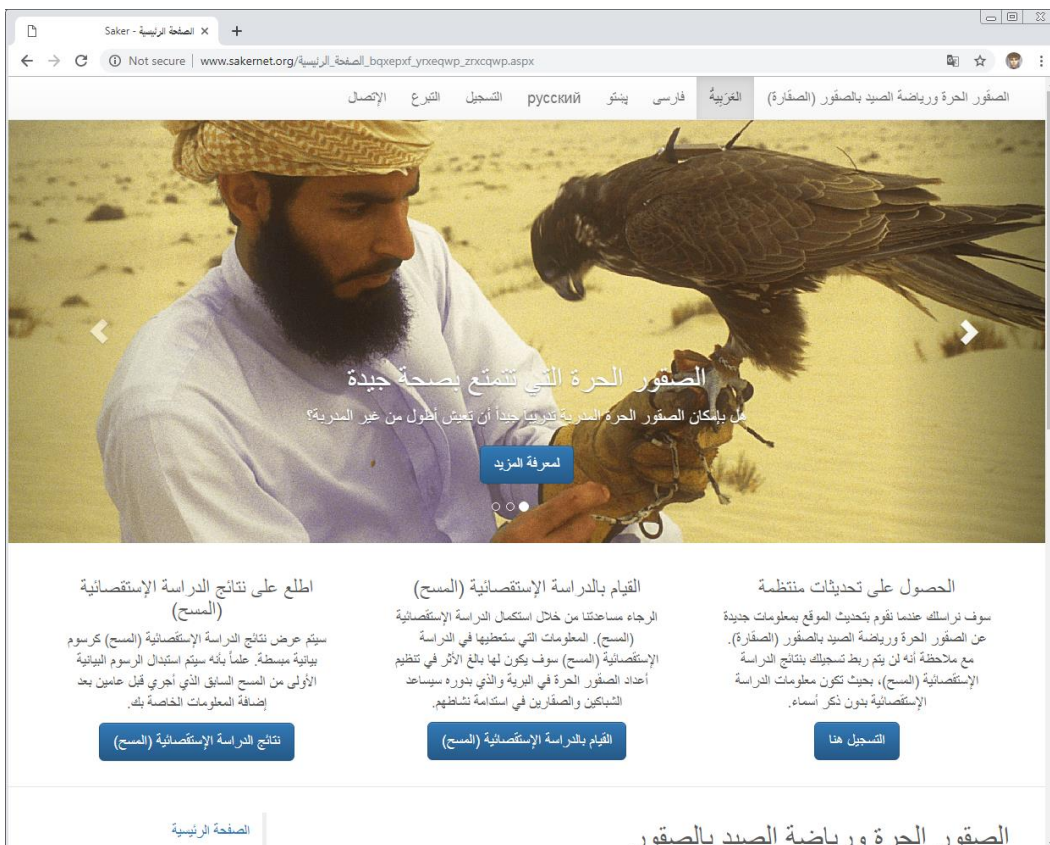


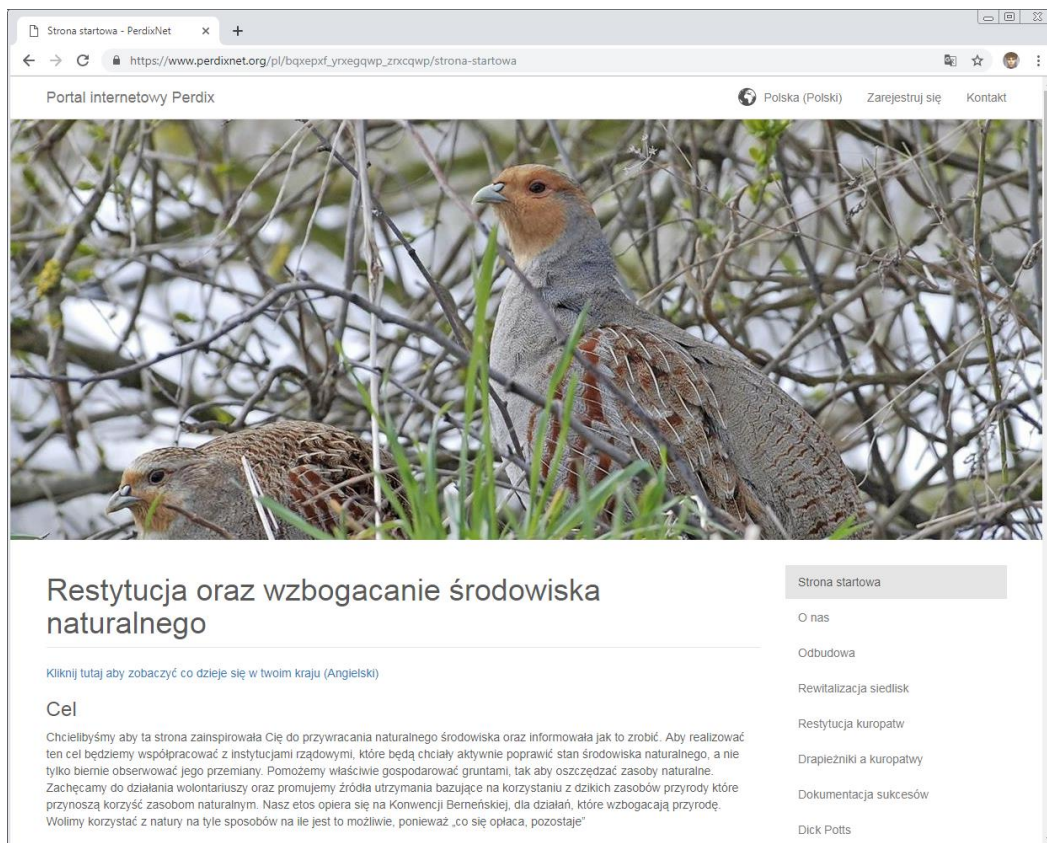
It had other important features

users interested in the sustainable use of nature could register on the published site
it was connected to a payment engine so that we could take donations

SAKER AND PERDIX

We further developed the Naturalliance platform for species-specific portals, sakernet.org
for the saker falcon, limited to Middle Eastern languages and Russian





and perdixnet.org for the grey partridge, limited to the languages of Europe.

MORPHmaster

But we realised that the code for all of these was essentially the same, and that we should manage one system to cover all of them. The MORPHMaster content management system is the culmination of this and now houses

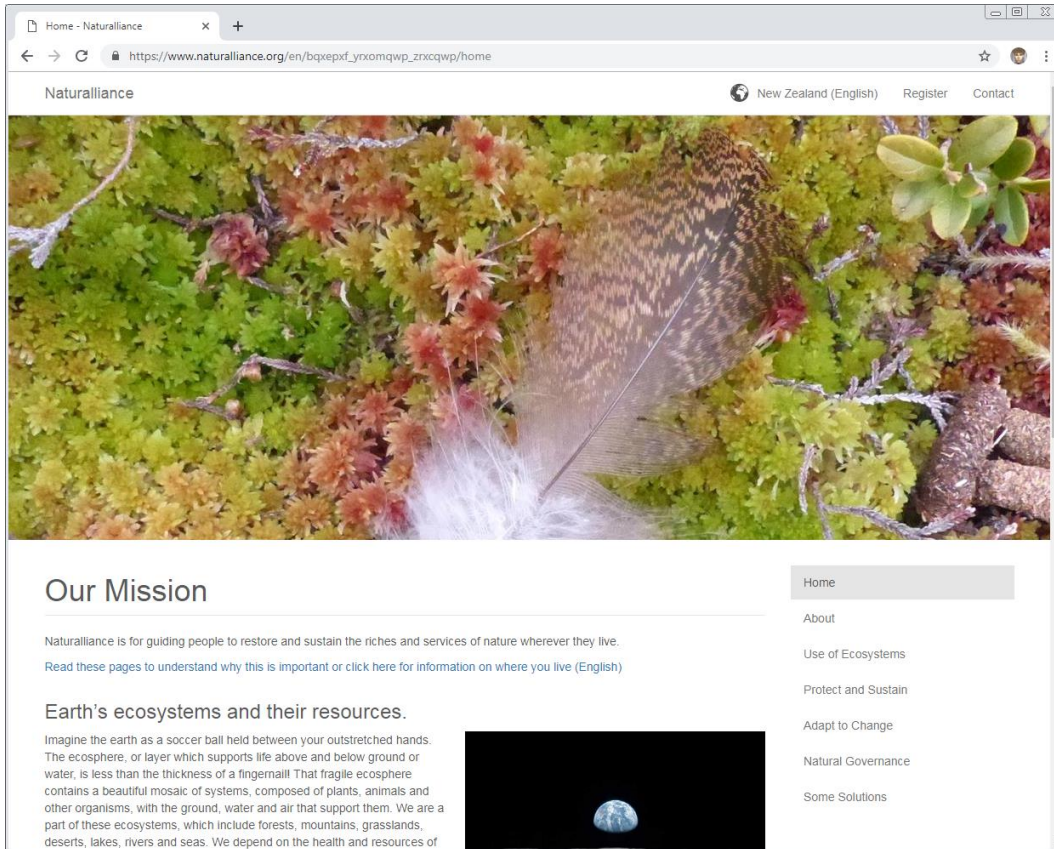
SakerNet, PerdixNet, the brand new AmFalCon.org and Naturalliance.org, which is at naturalliance.org

each instance of the platform allows the editor to select the languages they are to be translated into

it has editable sponsorship content

and comprehensive user registration functionality for mailing lists

It uses state of the art cloud hosting on Amazon Web Services and is easily scalable if, as we hope they will, the web sites start to get busy.



SYCL

SYCL (The System For Community Liason) is a content management system of a different kind, and hosts dozens of web sites.



While the Morphmaster back-end tools are in English, the SYCL back end is translatable, which means that editors can create web sites in the language of their choice, using tools that they understand.

Arne Parish

Home Neighbourhood Plan News Documents Contact Us Register **Editor**

Duration: Depends on play area
Difficulty: Some narrow gates

Calendar
Notices
Classifieds
Mapping
Gallery
Services
Interests
Nature Actions

Search

have been photographed by Google. In that case, a picture loads in the map frame and the hand can be used on the ring round the pointers to swing the camera to different views and even to zoom for a closer look.

More Routes

- [2-Ridge Dog Walk Option](#)
- [3-Stoborough Dog Walk Option](#)
- [4-Sunnyside-Furzebrook Circuit](#)
- [Arne Parish Boundary](#) For general information only

There is a range of page types available to SYCL, including different ways of presenting content and links. You can add events and classified advertisements. You can create a set of image galleries, and you can add Google maps to the site, annotated with key locations, boundaries and paths, created using a tool within SYCL.

Neighbourhood Plan

Link Position
Top Menu

Page Title
Arne Parish Neighbourhood Plan News

Page Image [Remove Image](#)
NP_Survey_Info_Evening_Nov_2014.jpg

Image Width
Half Column Width

Image Text
Studying maps at the Survey Review Information Evening in November 2014

Main Content

The Neighbourhood Plan is available for public consultation. You can view a copy of the Neighbourhood Plan by clicking; [Arne Parish Neighbourhood Plan](#) on [14th December 2018](#).

We would ask you to complete the consultation sheet and return it to my email to arneparishcouncil@gmail.com or via post to the Clerk at Rye Hill Farm, Rye Hill, Bere Regis, Wareham BH20 7LP or hand it back to any of the Parish Councillors.

[Response form](#)

Response forms will also be available at the Consultation Drop In on Monday 14th January 2019 at Stoborough

Path: p

SYCL uses a WYSIWYG editor for editing text. WYSIWYG is an acronym for What You See Is What You Get. It allows users to change text sizes, fonts and colours and add links to web pages, without needing to know HTML, the computer language of the web. It is a powerful tool, however it is very easy for an editor to disregard the rules of good design when using it, for example mixing up fonts and colours, and making a site look higgledypiggledy.

The screenshot shows a web browser window with the address bar displaying 'esug.sycl.net/10/esug-general-meetings'. The page title is 'European Sustainable Use Group - supporting IUCN'. The navigation menu includes 'Home', 'About', 'Meetings', 'Documents', 'Contact Us', 'Register', and 'Editor'. The 'Meetings' menu item is highlighted.

On the left side, there is a sidebar with a search bar and a list of links: 'Calendar', 'Our Portal Systems', 'News', 'Current Projects', 'Stories', 'Project History', 'Nature Actions', 'IUCN-SUME page', and 'Naturalliance Page'.

The main content area features a section titled 'ESUG General Meetings' with a sub-section 'Meetings in Karlovac, Croatia, 23-25 April 2019'. The text describes the next general meeting, mentioning the location in Karlovac, the date (24 April 2019), and the involvement of SUME and IUCN's Commission on Ecosystem Management. It also provides information on logistics, including travel and accommodation. A photograph of a meeting room is included.

Below this, there is a section for 'General Meeting in Brussels' dated 11 May 2017, mentioning Dr. David Scallan and the Federation of Associations for Hunting and Conservation of the EU. A photograph of a meeting in a grand hall is also shown.

On the right side, there are two sections: 'Next ESUG General Meeting' (24 April 2019 in Karlovac, Croatia) and 'Meeting Reports to download' (11 May 2017 in Brussels and 24 June 2015 in Vienna). A list of downloadable minutes and accounts from 2013 to 2018 is provided.

The sites are designed so that they work on all screen sizes from phones to retina screens on Apple workstations. We have plumped for Google/Wikipedia black on white theme, which should fit most situations, though when we have some funds we hope to splash out on improved graphic design.

SYCL also has a feature where satellite sites can contain the pages from a parent site, which brings a community together.

Notice the Not Secure message here. The Internet is perpetually throwing us challenges - this is Google recently deciding that no information should pass over the Internet unless it is encrypted. This is a public web site and we WANT people to view this data. It does not need to be encrypted.

My heart sank when I first heard this - the SSL certificates which do the encrypting were expensive and fiddly to install. Also certificates only worked on named sites, and SYCL hosts hundreds of sites!

However, we have now learned of an open source certificate provider which will mean not only can we get certificates for free, but we can automate the installation process. We are using this on the MORPHmaster sites, we will soon apply it to SYCL and lose this red message.

The Anatrack systems face a number of other challenges, some of these I have touched upon already.

Challenges for the Anatrack Portal Builders

- **Competition**
Alternative content management systems, social media sites
- **Legislation**
GDPR, ePrivacy, Online Harms
- **Security**
Email spammers, web site hacking, passwords
- **Translation**
Avoiding HTML, more language-country combinations than Microsoft, language selection UI, right-to-left scripts
- **Presentation**
Keeping contemporary, no in-house expertise, funding

EVER CHANGING ONLINE ENVIRONMENT

competition, legislation, security, translation, presentation, the ever changing web environment

COMPETITION

All our products face competition from alternative solutions

For the portals, there are many alternative content management systems, some free such as WordPress

- though we believe setup and site editing is easier in SYCL
- and it is certainly safer

- Facebook, Twitter and other social media platforms are also direct competitors

- as they allow users to quickly publish text and images

- but there is an increasing tendency not to trust what is there

- one advantage of being a small company is that we are also agile. We can fix bugs very quickly, and can develop new features if we can think of them, and when funds are available.

LEGISLATION

Keeping up with all the new legislation has been a challenge

You all know about GDPR, European regulation to protect the personal data of individuals, and make sure web sites ask explicit permission for collecting and using any such data.

It took a while to understand what was actually required, but we have implemented it across our entire web presence to what we believe is a good standard

ePrivacy regulation is upcoming and will reinforce the rules set out in GDPR, though we are not yet sure what this involves

And this month the UK government has announced the Online Harms initiative, which will need close attention. Harmful content will need to be quickly removed, easy for us now but more of a challenge as we scale.

Security is a continuing and growing issue

EMAIL SPAMMERS

Over the last year, and to both our amusement and frustration, we have had an increasing problem with email spammers

All our web sites have Contact us and Registration forms, people fill them in and administrators such as me and Robert are emailed with the form contents.

But there are many bots, which are bits of code, running on the Internet and filling out these forms automatically, which means that Robert and I have been bombarded with emails trying to sell us all kinds of shady products.

bitcoin brokering, plastic surgery and iphones, performance enhancing drugs and lots and lots of hot dates. They come in many different languages, possibly because our sites are in so many different languages.

But after a few attempts, we currently have the upper hand. I have laid what is called a honeytrap for the bots, which is an input box in the form placed off screen, so invisible to a human. The bots do not realise it is off the screen and fill it in, forms with the field filled in, we can ignore!

Not one bot has got past this latest trap, but we are sure this is an ongoing battle.

THE CYBER WAR

While we have been concerned about the spammers, they are an inconvenience rather than a danger. However there is real danger.

I have programmed the web sites to email me when errors occur, so that I can fix bugs quickly.

However I get ten or twenty times the emails than were caused by the email spammers, from errors caused by proper hacking attempts, attempts to gain access to our platforms and to the data.

These errors are of two kinds:

many are calls to pages that do not exist - the hacker assumes our site is built with Wordpress so is looking to exploit holes in that system. By not being Wordpress, we have a distinct advantage.

others are injection attacks, a common way to get into a badly programmed system where the hacker attaches code to the URL, but I have programmed against these as well as my years of experience have taught me

Other security measures include

patching the servers regularly, to fix security vulnerabilities.

closing ports on the servers and installing firewalls.

But most breaches are caused by the hacker having access to passwords. Our sign up procedure, whereby every editor creates his own password via an email, guarantees that the right person is creating the password, and that only he knows it.

I am sure you know this, but please do not give your passwords to anyone else, especially not over email or any kind of messaging including WhatsApp.

In case things do go wrong, we do nightly backs of all the data in the systems to Amazon storage in Dublin.

TRANSLATION

This has been a problem only because we support more language-country combinations than Microsoft. We have had to code around this issue but it seems to be working.

However, translation does throws up lots of challenges, not least because MORPHmaster now supports more language-country combinations than the Microsoft platform it is built on.

PRESENTATION

This is a challenge because trends change so quickly on the web and because we have no in house design expertise. We have to prioritise efficiency over looking pretty.

Conclusions

There is further work to do

SYCL

We would like to make SYCL more flexible

- currently you can only have a limited number of pages of a specific type;
- the change would mean you could have as many pages of a particular type as you want.

Merge SYCL and MORPHmaster

It would be excellent to build a product where

site content could be translated, while the editing tool was also in many languages;

This would mean effectively merging SYCL and MORPHmaster.

Intelligent GIS

Our longstanding vision is to merge all that we have learned about web development, content management systems, translation and mapping with the analyses and modelling that is built into Ranges, to create an Intelligent Geographic Information System (iGIS), with a Decision Support Engine behind, as we proposed in the TESSA bid to the European Commission.

Anyone with a question about the environment or a particular species would ask the iGIS, and it would return an answer based on the big data stored within, using expert knowledge and of course algorithms.

It just remains for me to say that it is a pleasure to be a member of this group, and I hope to meet everyone before tomorrow.

Thank you very much