JOINT REPORT of **MR ANDREW CALDER** **and** **DR IAN FERGUSON** **CMP209.2016-7.S2 (Digital Forensics 1)** **Case against:** **MR JOHN DOE** **Police Reference No: (if applicable)** **Case Reference No: (CCU or equivalent ref)** **PF Reference No: (if applicable)**	

Summary

Following the seizure of Mr Doe's computing equipment, a digital forensic investigation was launched. The investigation revealed an extensive collection of material relating to birding (MRB). The internet history revealed the suspect would habitually search for new MRB and would often access previously saved MRB when doing so, in total the internet history revealed 158 counts of MRB access. The suspect had saved an entire webpage of MRB to his computer. The hard drive of the suspects computer was found to contain 85 images, 3 audio files and 9 documents (.pdf, .doc and .txt) all containing MRB. There was also communication between the suspect and other persons via the Mozilla Thunderbird email client; of the 85 images found on the hard drive, 7 of them were sent to the suspect by someone identifying as 'Ben Forbes'. A USB pen drive was also connected to the computer at several points; the suspect accessed several folders on this drive which had names corresponding with MRB. Attempts were made to hide evidence in various ways; most notably a folder containing 5 images was encrypted with high level encryption (PGP).

In total, there were 281 counts of MRB discovered in our digital forensic investigation, these are broken down into types, as can be seen below in table 1.

Type	**Number of Offending Items**
Image	85
Audio	3
Document	9
Email	4
Hidden/Encrypted	22
Internet History	158

Table 1 – Types of Offending Items.

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1) Description of Crime

Incident 1 - 2nd of February 2005

Between 14:11 and 14:42 - multiple websites containing MRB were accessed by the suspect. This included the webpage saved in user johndoe's My Documents folder "aa010703a.htm". This web page has multiple references to birding activities such as building a 'Bluebird Nest Box for Wild Birds'.

The suspect also downloaded 2 of the 3 audio files found during the physical search on this day; 'Kakapo.ram' and 'Dawn.ram' respectively.
The browser activity for the 2nd of February 2005 can be seen in Appendix 1 – "Browser activity of 2nd February 2005".

From 14:18 till 14:43 the suspect accessed 6 different items of MRB. The accessed items and the times at which each was accessed can be seen in Appendix 2 – "MRB Access of 2nd February 2005".

At 16:46 the suspect created a file encrypted with GPG called 'birdpics.gpg', the files contained were found to have come from a USB pen drive 'Drive E' which was not found in the suspects accommodation when the seizing of potential evidence took place. The images contained in the gpg file can be seen in Appendix 7 – "Images from GPG File".

Incident 2 - 3rd of February 2005

Between 12:21 and 15:03 - the suspect performed multiple web searches for bird related terms such as "bird mating calls", "young chicks" – which was searched multiple times, and "bird screensavers". Several of these searches yielded results that were saved to the computer. Some of the many images that appear in the screensaver can be seen in Appendix 9 - "birds.zip Screensaver"

When the suspect searched for bird mating calls he accessed a site called "Chickadee Karaoke" from which the aggressive mating bird call was saved. The browser activity for the 3rd of February 2005 can be seen in Appendix 3 - Browser activity on 3rd February 2005

From 12:22 till 15:52 the suspect accessed 15 different items of MRB. This included the Aggressive mating bird call and the other recently downloaded files. On this day the suspect also accesses "ready2fledge.jpg" in another users sub directory – suggesting the suspect knew it was there and, in combination with other evidence it can be confirmed that it was the suspect that placed it there. The accessed items and the times at which each was accessed can be seen in Appendix 4 – "MRB Access of 3rd February 2005".

Incident 3 – 9th of February 2005

At 11:57 the suspect performed a google search for "bird screensavers", from the Firefox history it appears that the suspect looked at two different screensavers from one site before deciding on one which he then downloaded "birds.zip". The browser activity for the 9th of February 2005 can be seen in Appendix 5 – Browser activity on 9th February 2005.

Between 11:28 and 16:57 – the suspect accessed the newly acquired file and nearly all of the previously downloaded files. The suspect accessed MRB 33 times this day which was far more than any other day. Certain files were accessed multiple times which suggests the suspect was either doing something with the files or repeatedly coming back to view them - an addiction of sorts. The Accessed items can be seen in Appendix 6 – "MRB Access of 9th February 2005".

The total collection of recovered images can be seen in Appendix 1 – "Collected Images". Internet history is divided into two sections, one for Internet Explorer (Appendix 2 – "IE History") and one for Firefox (Appendix 3 – "Firefox History"). The MRB Audio files can be found in Appendix 3 – "Audio

Files". The MRB documents can be found in Appendix 8 – "All documents",

Refer to 2.4) Analysis for detailed review of how evidence was processed to produce the breakdown of events above.

2) Description of Investigation

2.1 Job Description and Instructions

We were tasked with investigating Mr John Doe by Dr Ian Ferguson. It is suspected that Mr Doe is involved with MRB. We were instructed to seize the electronic items of the suspect which may hold evidence which will support the State's case against. Standardized digital forensic investigative techniques were used to retrieve said evidence.

2.2 Description of Recovered / Examined Items

Upon entering the suspects accommodation, we searched for electronic items that may be of significance to the investigation. All electronic items found were connected to a single PC. The PC and monitor were both in a static (powered off) state when they were discovered, this meant that the equipment could be seized without damaging any potential evidence. The seized items are listed in table 2 below.

ID	TYPE	SERIAL NUMBER	DESCRIPTION
ACERHW-JD-1 ACERHW-JD-12	DESKTOP PC	 DTD1ACA100 612C0008067	MODERN HP DESKTOP **STATE:** *OFF* **CONTAINS:** *1x 1TB TOSHIBA HDD* *1x DVDRW*
ACERHW-JD-11	MONITOR	NA	BLACK/SILVER HP MONITOR **STATE:** *OFF*
ACERHW-JD-8 ACERHW-JD-10	KEYBOARD CABLE	NA NA	BLACK HP KEYBOARD CONNECTED CABLE
ACERHW-JD-7 ACERHW-JD-9	MOUSE CABLE	NA NA	BLACK HP LASER MOUSE CONNECTED CABLE
ACERHW-JD-2 ACERHW-JD-3 ACERHW-JD-4 ACERHW-JD-5 ACERHW-JD-6	CABLES	NA NA NA NA NA	USB-B/USB-A CABLE DISPLAYPORT CABLE ETHERNET CABLE 3-PIN POWER 3-PIN POWER

Table 2 – Electronic Items Seized

Once the seized items had been securely transported they were signed into appropriate storage by the Desk Sergeant.

2.3 Methodology

The HDD (ACERHW-JD-12) was removed from the HP Desktop (ACERHW-JD-1) and put aside. Then the PC was plugged into a power socket and switched on. As the HDD had been removed the system booted directly to BIOS (basic input/output system) without any user intervention. Inside the BIOS various settings can be viewed, of particular interest to the investigation was the time and date settings as these can determine whether the system clock is skewed.

The HDD was then connected to one an investigators PC via a USB/SATA connector. A MD5 checksum of the HDD was calculated using MD5deep and then an image of the HDD was made using GNU DD. A MD5 checksum was then made of the HDD image; as the checksum of the image was the same as the image of the HDD it was confirmed that the image was an exact copy of the HDD.
From this point onwards all investigation was performed on copies of the image to ensure there could be no corruption of evidence.

Using a copy of the drive image (image.dd/johndoe.dd) a physical search was performed. A physical search effectively treats the image.dd as one large file and searching for file headers which are effectively a signature to identify the format of the corresponding file. The software used was Foremost which then packages the found files into folders of the corresponding type e.g. all images stored together. Another piece of software called Metacam was used to sift the output images for images taken with a Canon PowerShot SD100.

Following the physical search the next task was to reduce the number of files in the investigation that require manual inspection., through the use of a 'whitelist' of known good files this can be achieved. Using a technique called loopback mounting, an image of a clean Windows XP installation can be accessed by the file system. Then an MD5 checksum of each file and folder is calculated, the output of this is stored as the whitelist database file. The virus scan was then performed using the same loopback technique, except this time the johndoe.dd image was used.

Next, the Operating systems registry files were examined to determine which (if any) USB devices have been connected to the suspects computer and what software was installed an accessible to the suspect.

The suspects web history was recovered by using the loopback technique to find index.dat files (for internet explorer) and the history.dat (for firefox) and then processing them with a tool called Web Historian by Mandiant (not to be confused with the Chrome Extension/Webhistorian.org).

Having gathered all sources of digital evidence the analysis could now begin.

2.4 Analysis

Preliminary Examination

The system clock was skewed by -2 minutes which is a negligible amount as it is still well within the time that the suspect would have had it in his possession. It does not alter the times of the incidents enough to damage their credibility either. The clock skew can be seen in Appendix 10- "Clock Skew".

The disk capacity was found to be 5.7627GB and was split into three partitions. Of the 3 partitions, 1 was formatted as NTFS and the other two were unallocated. Information on the partitions can be found in Appendix 11 - "Partitions".

The physical search returned several images, some did not contain any EXIF data but most those which did were taken by a Canon PowerShot SD100. Of the images taken with the Canon PowerShot SD100, 19 unique images were found to contain some form of MRB out of a total of 43 unique images. There was also an image taken with a Canon EOS-1DS and another taken with a SONY CYBERSHOT, these were both MRB. The offending images can be seen in Appendix 12 - " All Images of MRB".
The remaining 35 images were either duplicates of other images or contained no identifying EXIF data, all images found in the physical search can be seen in Appendix 13 - "Physical Search Images".

Other than images, the physical search revealed 2 MRB PDFs, "University of California - Botanical Garden Newsletter – Birds at the UCBG" and "The Porter County Birding Guide" These PDFs can be seen in Appendix # - "PDFs".

Creating the whitelist proved to be very useful indeed, core windows files were removed from the search and although logs and other modifiable core system files remained, it vastly reduced the volume of evidence that needed to be processed.

The virus scan returns only McAfee test signatures which are used to check if antivirus is working as intended and false positives which were checked by verifying the offending file 'Realplayer.exe' with virustotal.org; there is no virus on the system. It should also be noted that the suspects antivirus performed its own scan upon installation (24th Jan 2005 16:44:57) and this too returned no threats found. Our virus scan and the one performed by the suspect can both be seen in Appendix 14 - "Virus Scans".

Browser History

From investigating the suspects Internet Explorer history, we can deduce that this program was not used for much other than downloading/updating software and accessing MRB. In Internet Explorer history alone there were 56 counts of MRB access, out of a total of 334 items; the clear majority of which were Windows updates. The MRB from Internet Explorer can be seen in Appendix 15 - "MRB Access from Internet Explorer".

Initially the Firefox history was very clean; for the first two days after installing Firefox the suspect only installed programs. However, beginning at 14:11 on Feb 2nd, 2005 a significant number of searches for MRB were made. There are a couples of days where there is only activity relating to MRB. Of particular interest is the site accessed at 14:24:55 on Feb 2nd, 2005; The URL of the site is "http://birding.about.com/library/weekly/aa010703a.htm" which matches one of the saved websites found in the suspects documents folder 'aa010703a.htm'. The Firefox history can be seen in Appendix 16 - "Firefox History" and the saved website can be seen in Appendix 17 - "aa010703a.htm".

Attempts to hide MRB

The suspect made several attempts to hide his collection. The most extreme case of this was a file called birdpics (C:\Documents and Settings\johndoe\My Documents\birdpics.gpg) which was encrypted using GnuPG for Windows. The suspect had searched for "windows gnupg" using Firefox approximately 45 minutes before the gpg file was created. If these events had happened in reverse order we could conclude that the suspect had searched for something to open a file from another source but as the suspect downloaded the tool before the file was created it can be deduced that the suspect must have created the file himself.

The suspect did not give up the password used to create the GPG file and thus the investigators had to brute force the password which is a lengthy process. A tool called 'GPG2John' was used on the private key to create a hash that could be brute forced by 'John The Ripper' which is a free password recovery tool. An incremental attack was used against the hash which luckily only took a few seconds to match. The suspicion that the suspect had created the file was confirmed by the fact that the suspect's private key when cracked produced a password that worked with the gpg file, this meant that it must be the same private key used to create the file. The password for the GPG file was discovered to be "arran"; this is believed to reference where some of the pictures were taken. The password recovery can be seen in Appendix 18 - "Password recovery".

Initially there were some issues extracting the images from the zip file contained within the birds.gpg file, some of the images would extract but were corrupted. This was remedied by testing different file extensions as it may have been another extension mismatch; it turned out that this was the case – the file was actually a .Jar rather than .zip meaning. Using the java jar extraction tool, we were able to successfully recover all images. The extracted images themselves confirmed their origin; their filenames contain the origin location, for example "E/birds/birdpics/WhiteFacedHeronFlying.jpg", suggests that the suspect created the gpg file of the entire contents of the E pen drive. The images found in the gpg file can be seen in Appendix 7 - "Images from GPG file".

A reverse search for "arran" revealed that John Doe's Mozilla Thunderbird account password was also "arran" as it is stored locally as a base64 encoded string.

There were also several files with mismatched extensions, for instance a zip folder had been disguised as a DLL ("CrouchingKokako.dll"), although some of the mismatching appears to be a client error (7

files from email contain underscores throughout the name and extension), it is not possible for a zip folder to change to a DLL unless there was user intervention. There was a MRB jpg disguised as an exe inside the WINDOWS folder, similar to the previous point; this is not possible without user intervention – especially as we have confirmed there are no viruses on the system. The images that had deliberately mismatched file extensions can be seen in Appendix 19 - "Mismatched Extension MRB".

Emails

The suspect received several emails from someone identifying as 'Ben Forbes', Ben sends the suspect multiple MRB items. One of the emails from Ben says, "Thanks for the pics you sent me here are some I really like" There was no sent folder stored locally and there was no evidence of there being one which suggests the suspect may have been communicating with Ben in another way but as it stands there is no hard evidence that the suspect was distributing images. There was also a single email from a birding mailing list which was providing tips for bird watching. Mailing lists must be signed up for which implies that the suspect subscribed to receive this content. The emails (and their attachments) can be seen in Appendix 20 - "Emails to the Suspect".

Other

To provide better visualization of some of the evidence we decided to create a virtual machine of john doe's system. A virtual machine is an emulation of a computer, in this case it is an emulation of the suspects computer and is a good way to inspect the system without requiring access to the physical hardware it is run on. An image of the suspects system in a suspended state on a virtual machine can be seen in Appendix 21 - "Virtualizing Suspects System".

Initially there was suspicion that another user account on the system 'bob' had been accessing bird images too; there was a single item of MRB found in their 'My Music' folder. However, upon examining the internet explorer logs it was discovered that johndoe had saved the image into bobs folder; most likely without bobs knowledge as the folder contains only sample music and no other files. It is not clear whether this was an attempt to incriminate bob or just another attempt to conceal images from his own account. There was also the issue of how johndoe was able to save it to a folder of another user account; as the sole administrator account on the system johndoe had higher privileges than the other users and would be able to do this. The MRB from bob's music folder can be seen in Appendix 22 - "MRB on Other Accounts".

In the suspects documents folder, several items of MRB were found, all of which can be tied back to websites which had been visited. The suspect had been saving MRB he found on websites. A screenshot of the suspects documents folder and pictures folder can be seen in Appendix 23 - "Suspects Local Files".

While investigating the suspects documents folder, we discovered a message or letter that had been typed up that was very suspicious in wording; looking at the original file name it was called "Birds to find.doc" this was later updated to "stuf.doc". A reverse search for the term 'Birds to find' revealed an Audio file – "Aggressive_song.wav" this appeared to be a recording of bird mating calls. Within the wav file itself was a list of birds under the heading birds to find. It is highly unlikely this is a coincidence. The document can be seen in Appendix 24 - "Suspicious Document" and the internal contents of the wav file can be seen in Appendix 25 - "Hidden Bird List".

A document titled birdwatching was found in the root directory of the primary partition. As johndoe was the only user with administrator privileges he is also the only one capable of accessing this area of the drive; limited user accounts are given write permission errors if they try to act out of their own subdirectory. User status can be seen in Appendix 26 - "Account Privilege Level" and the document can be seen in Appendix 8 - "Birdwatching.doc"

2.5 Production List and Associated Description

Table 3 below shows all evidence types produced during the case.

Name	Types	Description
Images	.BMP, .JPG, .JPEG, .PNG	The images containing MRB that were recovered
Audio	.WAV, .RAM	The Audio files containing MRB that were recovered
Emails	PLAIN TEXT	The recovered Emails and their corresponding attachments
Documents	.DOC, .TXT, .PDF	The documents containing MRB that were recovered
Websites	.HTM, .HTML	Websites containing MRB that were saved to the hard drive that have been recovered
Composed Files	.ZIP, .JAR, .GPG	Compressed and/or encrypted files and folders that have been recovered

Table 3 – Evidence Types Produced

Table 4 below shows all supporting types produced during the case.

Name	Description	Use Case
Virtual Machine	An emulation of the suspects system.	Assisted in visualization of evidence.
Birdpics.jar	An extension-modified version of the GPG output.	By accessing the decrypted GPG file as a jar instead of a zip (default) all images could be extracted.
Image.dd/johndoe.dd	An exact copy of the suspects hard drive as a digital representation.	Prevented corruption of physical evidence through using these copies.
Screenshots	Screenshots taken from an emulated version of the Mr Doe's system	Assisted in visualization of evidence.

Table 4 – Supporting Types Produced

3. Conclusions

In total there were 96 images, 3 audio files, 9 documents, 4 emails and 22 obfuscated files that are classed as MRB (Material Related to Birds) recovered from the suspect's computer. The vast majority of these files can be found in the suspects own Documents and Settings folder, and the non-deleted ones that are found in other places can be tied to the suspect through access logs. A large number of items were discovered in the unallocated space of the hard drive in the form of orphan files and were only recovered through the physical search, it is believed that these items were stored on the USB pen drive 'E' and were transferred within a containing folder before being permanently deleted from the computer; thus creating the orphan files and explaining why most never appeared anywhere else.

The Malware scans performed both by the investigator and the suspect revealed no viruses or malware present on the system. The fact the scan before the incidents reveal nothing and the scan after the incidents also found nothing confirms that it was in fact a user; not malware that led to the collection of MRB on the computer.

The suspect downloaded MRB on multiple occasions and there are records of this in the Firefox browser history, meanwhile the internet explorer history reveals extensive daily access to the downloaded files. The suspect was repeatedly viewing saved content and searching the internet for more. Examination of the email client revealed that the suspect had signed up for mailing lists that promoted MRB and was receiving mail from another user who was supplying the suspect with further MRB. The encrypted and obfuscated files show the suspect was attempting to hide his MRB and was

very likely aware of the laws restricting access to this kind of content.

According to the 2001 Protection of Birds Act, the suspect is in violation of the law by possessing material relating to birds and encouraging further humiliation and physical abuse of these protected animals. The Email messages indicate the suspect may be in violation of other parts of the 2001 PoB Act such as the "Ban on Distribution of MRB" and if the Canon Powershot SD100 camera can be tied to the suspect then the suspect may be in violation of a further offence – "The Creation and/or Modification of MRB".

4. Equipment Required for Court Proceedings

4.1) Please refer to table 2 to see the electronic items seized as part of the investigation, all items in table 2 will need to be included.

4.2) A Specialized forensic workstation with the following will be required:

Computer
Microsoft windows 7 (or higher) – Required to run autopsy tools
Autopsy – Digital forensic investigation suite
Mandiant Web Historian – used to view history files
VMWare Workstation 12 Pro

Additionally, Virtual machines with the following tools/ software installed will be required.

Virtual Machine 1 – Forensic workstation
Ubuntu 16.04 – Linux based operating system that allows use the other tools listed
Java Jar Extract – Allows uncorrupted extraction of the GPG files
GPG2JOHN – Converts the GPG private key into a format John The Ripper can read
John The Ripper – A free password recovery tool that can be used to find the GPG password
GPG – Allows us to extract the GPG file once we have the password
MD5deep – Creates MD5 checksums which help verify copies of the hard drive
CLAMAV – Antivirus that can check individual drives

Virtual Machine 2 – Emulation of Suspects computer
John Doe virtual machine – Demonstrates the extent of the suspects involvement with MRB

4.3) A screen or projector to ensure everyone can see the findings.

Appendices

KEY:

RED = MRB, YELLOW = CONNECTION TO MRB, GREEN = CLEAN, GREY = CLEAN BUT RELEVEANT TO CASE

Appendix 1 – Browser activity on 2nd February 2005

Google Search: birds	http://www.google.co.uk/search?client=firefox-a&rls=org.mozilla%3Aen-GB%3Aofficial_s&hl=en&q=birds&meta=&btnG=Google+Search	02/02/2005 14:11
The Life of Birds	http://www.pbs.org/lifeofbirds/	02/02/2005 14:11
The Life of Birds | Songs	http://www.pbs.org/lifeofbirds/songs/index.html	02/02/2005 14:12
	http://www.googleadservices.com/pagead/adclick?adurl=http://www.amazon.co.uk/exec/obidos/external-search%3Ftag%3Droscosolution	02/02/2005 14:14
Amazon.co.uk: Search Results Books: birds	http://www.amazon.co.uk/exec/obidos/external-search/026-5665785-2744400?tag=roscosolutions&keyword=birds&mode=books-uk	02/02/2005 14:14
	http://www.google.co.uk/pagead/iclk?adurl=http://www.amazon.co.uk/exec/obidos/external-search%3Ftag%3Droscosolutions%26keyword	02/02/2005 14:14
	http://www.amazon.co.uk/exec/obidos/external-search?tag=roscosolutions&keyword=birds&mode=books-uk	02/02/2005 14:14
Amazon.co.uk: Books: Garden Birds (Collins Gem S.)	http://www.amazon.co.uk/exec/obidos/ASIN/0007176147/qid=1107353690/sr=2-1/ref=sr_2_11_1/026-5665785-2744400	02/02/2005 14:14
Amazon.co.uk: Books: The Secret Lives of Garden Birds	http://www.amazon.co.uk/exec/obidos/ASIN/0713666161/qid=1107353690/sr=2-3/ref=sr_2_11_3/026-5665785-2744400	02/02/2005 14:15
Google Search: bird wallpaper	http://www.google.co.uk/search?q=bird+wallpaper&sourceid=mozilla-search&start=0&start=0&ie=utf-8&oe=utf-8&client=firefox-a&rls=or	02/02/2005 14:15
Free Bird Wallpaper - Bald Eagle Albatross Owl Falcon 1024x768	http://www.naturewallpaper.net/birds_L.html	02/02/2005 14:15
	http://as.casalemedia.com/s?s=53524&u=http%3A//www.naturewallpaper.net/birds_L.html&f=2&id=5780266264.517584	02/02/2005 14:15
3-Home	http://isg10.casalemedia.com/V2/40842/43608/	02/02/2005 14:15
	http://pagead2.googlesyndication.com/pagead/ads?client=ca-pub-0241683974610684&dt=1107353756202&lmt=1107353751&format=46	02/02/2005 14:15
	http://asg36.casalemedia.com/s?s=53524&u=http%3A//www.naturewallpaper.net/birds_L.html&f=2&id=5780266264.517584	02/02/2005 14:15
	http://isg10.casalemedia.com/V2/40842/43608	02/02/2005 14:15
bald_eagle3.jpg	http://www.naturewallpaper.net/birdsLpages/image4.html	02/02/2005 14:16
Winner !!!!	http://media.fastclick.net/w/get.media?t=n&sid=11194&m=1&f=b&v=1.4&c=1495&r=http%3A//www.naturewallpaper.net/birds_L.html&d	02/02/2005 14:16
	http://pagead2.googlesyndication.com/pagead/ads?client=ca-pub-0241683974610684&dt=1107353782360&lmt=1107353781&format=46	02/02/2005 14:16
Winner !!!!	http://media.fastclick.net/w/get.media?t=n&sid=11194&m=1&f=b&v=1.4&c=7262&r=http%3A//www.naturewallpaper.net/birds_L.html&d	02/02/2005 14:18
snow_geese.jpg	http://www.naturewallpaper.net/birdsLpages/image21.html	02/02/2005 14:18
	http://pagead2.googlesyndication.com/pagead/ads?client=ca-pub-0241683974610684&dt=1107353925746&lmt=1107353925&format=46	02/02/2005 14:18
	http://pagead2.googlesyndication.com/pagead/adclick?sa=L&ai=Bv4uhneAAQrfmAqX-QcmCpMoK0MuACPLnwJwBwI23AcC4AhACGAlg05r2	02/02/2005 14:19
	http://pagead2.googlesyndication.com/pagead/iclk?sa=l&ai=Bv4uhneAAQrfmAqX-QcmCpMoK0MuACPLnwJwBwI23AcC4AhACGAlg05r2ASg	02/02/2005 14:19
SHOP.COM - Search results for bald eagle	http://uk.shop.com/amos/cc/main/ccn_search_catsa/st/bald+eagle/sy/products/ccsyn/518/SourceID/30	02/02/2005 14:19
SHOP.COM - Bird Safari - Bird Watcher's Paradise from Choices Direct - Movies is available in Documentary	http://amos.shop.com/amos/cc/main/catalog/pcd/7107298/prd/10187717/ccsyn/518/_x_/Choices-Direct---Movies-Bird-Safari---Bird-Watc	02/02/2005 14:20
Google Search: bird stories	http://www.google.co.uk/search?hl=en&client=firefox-a&rls=org.mozilla%3Aen-GB%3Aofficial&q=bird+stories&btnG=Search&meta=	02/02/2005 14:22
Untitled Document	http://z.about.com/0/ip/496/0.htm	02/02/2005 14:22
Click Here!	http://n479ad.doubleclick.net/adi/abt.hobbies/hobbies_birding;svc=;site=birding;t=14;pc=1;fd=0;fs=0;a=;sbj=pid512;kw=;chan=hobbies;syn	02/02/2005 14:22
	http://z.about.com/0/ip/512/6.htm	02/02/2005 14:22
	http://z.about.com/0/ip/512/12.htm	02/02/2005 14:22
Google Offers	http://z.about.com/5/ad/go.htm?gs=birding	02/02/2005 14:22
	http://z.about.com/0/ip/417/5.htm?CDN=hobbies	02/02/2005 14:22
Bird Stories and Tales	http://birding.about.com/od/storie1/	02/02/2005 14:22
Audience Match Data Agent	http://z.about.com/5/ad/am.htm?pid=about	02/02/2005 14:22
Click Here!	http://n479ad.doubleclick.net/adi/abt.hobbies/hobbies_birding;svc=;site=birding;t=14;pc=1;fd=0;fs=0;a=;sbj=pid512;kw=;chan=hobbies;syn	02/02/2005 14:22
Current Headlines	http://z.about.com/6/o/b.htm?gs=birding	02/02/2005 14:22
	http://z.about.com/7/o/cw.htm?gs=birding	02/02/2005 14:23
Click Here!	http://n479ad.doubleclick.net/adi/abt.hobbies/hobbies_birding;svc=;site=birding;t=0;pc=2;fd=0;fs=0;a=;sbj=pid512;kw=;chan=hobbies;syn=	02/02/2005 14:23
Related Articles	http://z.about.com/5/o/c.htm?gs=birding	02/02/2005 14:23
Click Here!	http://n479ad.doubleclick.net/adi/abt.hobbies/hobbies_birding;svc=;site=birding;t=0;pc=2;fd=0;fs=0;a=;sbj=pid512;kw=;chan=hobbies;syn=	02/02/2005 14:23
Click Here!	http://n479ad.doubleclick.net/adi/abt.hobbies/hobbies_birding;svc=;site=birding;t=0;pc=2;fd=0;fs=0;a=;sbj=pid512;kw=;chan=hobbies;syn=	02/02/2005 14:23
Wings of Terror - avian humor article for people interesting in birdwatching and others interested in birds	http://birding.about.com/library/weekly/aa102598.htm	02/02/2005 14:23
Click Here!	http://n479ad.doubleclick.net/adi/abt.hobbies/hobbies_birding;svc=;site=birding;t=0;pc=3;fd=0;fs=0;a=;sbj=pid512;kw=;chan=hobbies;syn=	02/02/2005 14:23
Alphabetical Index of Birds	http://birding.about.com/library/blalphatypeofbird.htm	02/02/2005 14:23
	http://clk.about.com/?zi=18/yV&sdn=hobbies_birding&tm=51&f=00&su=p512.6.140.ip_p512.12.140.ip_&tt=0&zu=http%3A//birding.about.	02/02/2005 14:23
Click Here!	http://n479ad.doubleclick.net/adi/abt.hobbies/hobbies_birding;svc=;site=birding;t=0;pc=3;fd=0;fs=0;a=;sbj=pid512;kw=;chan=hobbies;syn=	02/02/2005 14:23
Click Here!	http://n479ad.doubleclick.net/adi/abt.hobbies/hobbies_birding;svc=;site=birding;t=0;pc=3;fd=0;fs=0;a=;sbj=pid512;kw=;chan=hobbies;syn=	02/02/2005 14:23
Click Here!	http://n479ad.doubleclick.net/adi/abt.hobbies/hobbies_birding;svc=;site=birding;t=0;pc=4;fd=0;fs=0;a=;sbj=pid512;kw=;chan=hobbies;syn=	02/02/2005 14:24
	http://clk.about.com/?zi=18/yV&sdn=hobbies_birding&tm=20&f=00&su=p512.6.140.ip_p512.12.140.ip_&tt=0&zu=http%3A//birding.about.	02/02/2005 14:24
Specs for Building Birdhouses and for use in Bird House Plans	http://birding.about.com/library/blhousespecs.htm	02/02/2005 14:24
Click Here!	http://n479ad.doubleclick.net/adi/abt.hobbies/hobbies_birding;svc=;site=birding;t=0;pc=4;fd=0;fs=0;a=;sbj=pid512;kw=;chan=hobbies;syn=	02/02/2005 14:24
Click Here!	http://n479ad.doubleclick.net/adi/abt.hobbies/hobbies_birding;svc=;site=birding;t=0;pc=4;fd=0;fs=0;a=;sbj=pid512;kw=;chan=hobbies;syn=	02/02/2005 14:24
Click Here!	http://n479ad.doubleclick.net/adi/abt.hobbies/hobbies_birding;svc=;site=birding;t=14;pc=5;fd=0;fs=0;a=;sbj=pid512;kw=;chan=hobbies;syn	02/02/2005 14:24
How to Build Bird Houses and Nest Boxes	http://birding.about.com/od/buildhouses/	02/02/2005 14:24
Click Here	http://n479ad.doubleclick.net/adi/abt.hobbies/hobbies_birding;svc=;site=birding;t=14;pc=5;fd=0;fs=0;a=;sbj=pid512;kw=;chan=hobbies;syn	02/02/2005 14:24
Click Here!	http://n479ad.doubleclick.net/adi/abt.hobbies/hobbies_birding;svc=;site=birding;t=14;pc=5;fd=0;fs=0;a=;sbj=pid512;kw=;chan=hobbies;syn	02/02/2005 14:24
	http://birding.about.com/cs/buildhouses/index.htm	02/02/2005 14:24
Click Here!	http://n479ad.doubleclick.net/adi/abt.hobbies/hobbies_birding;svc=;site=birding;t=2;pc=6;fd=0;fs=0;a=;sbj=pid512;kw=;chan=hobbies;syn=	02/02/2005 14:24
Click Here!	http://n479ad.doubleclick.net/adi/abt.hobbies/hobbies_birding;svc=;site=birding;t=2;pc=6;fd=0;fs=0;a=;sbj=pid512;kw=;chan=hobbies;syn=	02/02/2005 14:24
Click Here!	http://n479ad.doubleclick.net/adi/abt.hobbies/hobbies_birding;svc=;site=birding;t=2;pc=6;fd=0;fs=0;a=;sbj=pid512;kw=;chan=hobbies;syn=	02/02/2005 14:24
Free Feeder and Birdhouse Plans Index	http://birding.about.com/cs/birdhousesfeeders/a/buildingindex.htm	02/02/2005 14:24
vonage_vpart_gothrubiz_336	http://view.atdmt.com/VON/iview/btcmxvon0260000015von/direct/01?click=http://n479ad.doubleclick.net/click%3Bh=v4|3213|3	02/02/2005 14:24
Birding and Birdwatching - Build a Bluebird Nest Box for Wild Birds	http://birding.about.com/library/weekly/aa010703a.htm	02/02/2005 14:24
Click Here!	http://n479ad.doubleclick.net/adi/abt.hobbies/hobbies_birding;svc=;site=birding;t=0;pc=7;fd=0;fs=0;a=;sbj=pid512;kw=;chan=hobbies;syn=	02/02/2005 14:24
Click Here!	http://n479ad.doubleclick.net/adi/abt.hobbies/hobbies_birding;svc=;site=birding;t=0;pc=7;fd=0;fs=0;a=;sbj=pid512;kw=;chan=hobbies;syn=	02/02/2005 14:24
Click Here!	http://n479ad.doubleclick.net/adi/abt.hobbies/hobbies_birding;svc=;site=birding;t=0;pc=7;fd=0;fs=0;a=;sbj=pid512;kw=;chan=hobbies;syn=	02/02/2005 14:24
Birding and Birdwatching - Painting or Staining Bird Houses and Feeders	http://birding.about.com/library/blhousefeederpaint.htm	02/02/2005 14:26
Click Here!	http://n479ad.doubleclick.net/adi/abt.hobbies/hobbies_birding;svc=;site=birding;t=0;pc=8;fd=0;fs=0;a=;sbj=pid512;kw=;chan=hobbies;syn=	02/02/2005 14:26
Click Here!	http://n479ad.doubleclick.net/adi/abt.hobbies/hobbies_birding;svc=;site=birding;t=0;pc=8;fd=0;fs=0;a=;sbj=pid512;kw=;chan=hobbies;syn=	02/02/2005 14:26
Click Here!	http://n479ad.doubleclick.net/adi/abt.hobbies/hobbies_birding;svc=;site=birding;t=0;pc=8;fd=0;fs=0;a=;sbj=pid512;kw=;chan=hobbies;syn=	02/02/2005 14:26
	http://clk.about.com/?zi=18/yW&sdn=hobbies_birding&tm=107&f=00&su=p512.6.140.ip_p512.12.140.ip_&tt=0&zu=http%3A//birding.abou	02/02/2005 14:26
	http://pagead2.googlesyndication.com/pagead/iclk?sa=l&ai=BiW5-JeMAQviVFI7YQa3yjJsK_PzSBq7nwZQBwI23AaCzIxABGAEgvKX3ASgIQlo	02/02/2005 14:27
	http://pagead2.googlesyndication.com/pagead/adclick?sa=L&ai=BiW5-JeMAQviVFI7YQa3yjJsK_PzSBq7nwZQBwI23AaCzIxABGAEgvKX3ASg	02/02/2005 14:27
Haith's Wild Bird Foods & Bill Oddie's tips and advice also bird feeder, peanut, birdseed, bird, garden birds, wildlife, nest box, bird table, birdcare, binocular, bird bath, squirrel, robin, books, videos & wildflower seeds,	http://www.haiths.com/	02/02/2005 14:27
Haith's Wild Bird Foods & Bill Oddie's tips and advice also bird feeder, peanut, birdseed, bird, garden birds, wildlife, nest box, bird table, birdcare, binocular, bird bath, squirrel, robin, books, videos & wildflower seeds,	http://www.haiths.com/Features.asp?lookup=0&brand=1&article_id=features_1&customer_id=PAA0219022305524FFFKSRSZKKXZGRWU	02/02/2005 14:28
The Birds (1963)	http://www.imdb.com/title/tt0056869/	02/02/2005 14:40
	http://www.imdb.com/google/box?num=3;k=power100-withsc;placement=midbucket;rnd=45504;sid=7845;referer=%2Ftitle%2Ftt0056869%	02/02/2005 14:40
Trailers for The Birds (1963)	http://www.imdb.com/title/tt0056869/trailers	02/02/2005 14:40
	http://www.imdb.com/google/box?num=3;k=power100-withsc;placement=midbucket;rnd=83932;sid=8055;referer=%2Ftitle%2Ftt0056869%	02/02/2005 14:40
	http://rcm.amazon.com/e/cm?t=ifr&t=imdb-rec-banner-20&l=st1&search=widescreen&mode=dvd&p=13&o=1	02/02/2005 14:40
Video Gallery for The Birds (1963)	http://www.imdb.com/rg/title-tease/trailers/title/tt0056869/trailers	02/02/2005 14:40
IMDB LINKING TO VIDEO DETECTIVE	http://www.imdb.com/google/box?num=5;k=maxww-sky;placement=2;rnd=872225854982059300;sid=-123;referer=maxww;slot=TOP_RHS	02/02/2005 14:40
	http://www.imdb.com/rg/TITLETRA_VIDDET//http://videodetective.com/home.asp?PublishedID=1843	02/02/2005 14:41
VideoDetective.com - Movie Trailers, Entertainment Previews, Streaming Video Samples.	http://videodetective.com/home.asp?PublishedID=1843	02/02/2005 14:41
	http://videodetective.com/test.asp?List=307629|838353&PublishedID=1843&ListID=&New=&CustomerId=97135&refreshed=TRUE	02/02/2005 14:41
	http://videodetective.com/test.asp?List=307629|838353&PublishedID=1843&ListID=&New=&CustomerId=97135	02/02/2005 14:41
	http://videodetective.com/player.asp?PublishedId=1843&List=307629|838353&Customerid=97135	02/02/2005 14:41
Video Detective Player	http://videodetective.com/choosespeed.asp?BrowserSupportActiveX=false&ActiveXPlayerInstalled=false&plugin=true&List=307629|83835	02/02/2005 14:42
	http://videodetective.com/Playlist.asp?	02/02/2005 14:42
	http://videodetective.com/titleinfo.asp	02/02/2005 14:42
Videodetective.com - Player	http://videodetective.com/player.asp?PublishedId=1843&List=307629|838353&CustomerID=97135&videokbrate=300	02/02/2005 14:42
	http://videodetective.com/play.asp?New=True&List=307629|838353&PublishedId=1843&VideoKbrate=300&ListID=&CustomerId=97135&I	02/02/2005 14:42
BBC NEWS | News Front Page	http://news.bbc.co.uk/	02/02/2005 14:44
	http://news.bbc.co.uk/nol/ukfs_news/hi/front_page/ticker.stm	02/02/2005 14:44
BBC NEWS | Politics | Blair defends house arrest plans	http://news.bbc.co.uk/1/hi/uk_politics/4227829.stm	02/02/2005 14:44
BBC Media Selector	http://www.bbc.co.uk/mediaselector/check/nolavconsole/ukfs_news/hi?redirect=fs.stm&news=1&bbram=1&bbwm=1&nbram=1&nbwm=1	02/02/2005 14:45
	http://news.bbc.co.uk/1/hi/uk_politics/4227829.stm#	02/02/2005 14:45
BBC NEWS | UK | Blair defends house arrest plans	http://news.bbc.co.uk/nolavconsole/ukfs_news/hi/newsid_4220000/newsid_4229700/bb_rm_4229711.stm	02/02/2005 14:45
Untitled	http://news.bbc.co.uk/nolavconsole/shared/player/player.stm?clipurl=http://news.bbc.co.uk/media/news_web/video/40545000/bb/40545	02/02/2005 14:45
Untitled	http://news.bbc.co.uk/nolavconsole/ukfs_news/hi/uk/bb_rm_promo.stm	02/02/2005 14:45
	http://news.bbc.co.uk/nolavconsole/ukfs_news/hi/front_page/bb_rm_promo.stm	02/02/2005 14:45
Untitled	http://news.bbc.co.uk/nolavconsole/shared/player/player.stm?title=Blair%20defends%20house%20arrest%20plans&clipurl=http://news.bb	02/02/2005 14:45
	http://news.bbc.co.uk/nolavconsole/ukfs_news/hi/front_page/bb_rm_banner.stm	02/02/2005 14:45
BBC Media Selector	http://www.bbc.co.uk/cgi-perl/mediaselector/app.pl?action=sc&alreadySeen=1&m=%2Fnolavconsole%2Fukfs_news%2Fhi&q=nbram%3D19	02/02/2005 14:45
	http://news.bbc.co.uk/nolavconsole/ukfs_news/hi/uk/bb_rm_banner.stm	02/02/2005 14:45
	http://www.bbc.co.uk/mediaselector/check/nolavconsole/ukfs_news/hi?redirect=fs.stm&nbram=1&news=1&bbwm=1&nbwm=1&bbram=1	02/02/2005 14:45
BBC News Player	http://news.bbc.co.uk/nolavconsole/ukfs_news/hi/bb_rm_fs.stm?checkedBandwidth=bb&nbram=1&checkedMedia=ram&news=1&nbwm=	02/02/2005 14:45
BBC NEWS | Scotland	http://news.bbc.co.uk/1/hi/scotland/default.stm	02/02/2005 15:11
	http://www.pbs.org/lifeofbirds/songs/kakapo.ram	02/02/2005 15:11
	http://www.pbs.org/lifeofbirds/songs/dawn.ram	02/02/2005 15:12
Google Search: windows gnupg	http://www.google.co.uk/search?q=windows+gnupg&sourceid=mozilla-search&start=0&start=0&ie=utf-8&oe=utf-8&client=firefox-a	02/02/2005 15:57
	http://www.gnupg.org/download.html	02/02/2005 15:57
Download - GnuPG.org	http://www.gnupg.org/download/	02/02/2005 15:57
WinPT	http://www.winpt.org/	02/02/2005 15:58
	http://www.stud.uni-hannover.de/~twoaday/winpt.html	02/02/2005 15:58
Google Search: windows gnupg	http://www.google.co.uk/search?q=windows+gnupg&hl=en&lr=&client=firefox-a&rls=org.mozilla:en-GB:official&start=10&sa=N	02/02/2005 15:58
GnuPG Windows	http://openpgp.vie-privee.org/wingpg.html	02/02/2005 15:58
Microsoft Application Search	http://shell.windows.com/fileassoc/0409/xml/redir.asp?Ext=pdf	02/02/2005 16:51
	http://shell.windows.com/fileassoc/0409/SearchEngine.asp	02/02/2005 16:51
Adobe Reader - Download	http://www.adobe.com/products/acrobat/readstep2.html	02/02/2005 16:52
Adobe Reader - Download Thank you	http://www.adobe.com/products/acrobat/readstep_servefile.html?hasjavascript=1&esdcanbeused=1&esdcanhandle=0&language=English	02/02/2005 16:52
	http://ardownload.adobe.com/pub/adobe/reader/win/7x/7.0/enu/AdbeRdr70_enu_full.exe	02/02/2005 16:53

Appendix 2 – "MRB Access of 2nd February 2005"

http://www.linorg.usp.br/mozilla//firefox/releases/1.0/win32/en-GB/Firefox%20Setup%201.0.exe	2005-01-24 16:19:35 GMT
file/Documents%20and%20Settings/johndoe/My%20Documents/My%20Pictures/tn_duck_3.jpg	2005-02-02 14:18:13 GMT
file/Documents%20and%20Settings/johndoe/My%20Documents/My%20Pictures/snow_geese.jpg	2005-02-02 14:18:53 GMT
file/Documents%20and%20Settings/johndoe/My%20Documents/My%20Pictures/7107298.jpg	2005-02-02 14:20:33 GMT
file/Documents%20and%20Settings/johndoe/My%20Documents/My%20Pictures/wbpremium_s.jpg	2005-02-02 14:28:19 GMT
file/Documents%20and%20Settings/johndoe/My%20Documents/nestboxtips.txt	2005-02-02 14:29:30 GMT
file/Documents%20and%20Settings/johndoe/My%20Documents/My%20Pictures/40m.jpg	2005-02-02 14:43:36 GMT

Appendix 3 – Browser activity on 3rd February 2005

Google Search: bird mating calls	http://www.google.co.uk/search?client=firefox-a&rls=org.mozilla%3Aen-GB%3Aofficial_s&hl=en&q=bird+mating+calls&meta=&btnG=Goo	03/02/2005 12:21
Chickadee Karaoke	http://whyfiles.org/shorties/104chick_sex/	03/02/2005 12:21
Google Image Search	http://www.google.co.uk/imghp?hl=en&tab=wi&client=firefox-a&rls=org.mozilla:en-GB:official_s&q=	03/02/2005 14:59
Google Search: young chicks	http://images.google.co.uk/images?client=firefox-a&rls=org.mozilla%3Aen-GB%3Aofficial_s&q=young+chicks&hl=en&btnG=Google+Searc	03/02/2005 14:59
Google Image Result for http://freespace.virgin.net/cobber.budgies/images/babyscot_vyoung.jpg	http://images.google.co.uk/imgres?imgurl=http://freespace.virgin.net/cobber.budgies/images/babyscot_vyoung.jpg&imgrefurl=http://free	03/02/2005 14:59
	http://images.google.co.uk/imgres?imgurl=http://freespace.virgin.net/cobber.budgies/images/babyscot_vyoung.jpg&imgrefurl=http://free	03/02/2005 14:59
Scottie's Baby Pictures - 1	http://freespace.virgin.net/cobber.budgies/stories/scottie_a.html	03/02/2005 14:59
Google Image Result for http://www.insaneanimals.com/items/177.jpg	http://images.google.co.uk/imgres?imgurl=http://www.insaneanimals.com/items/177.jpg&imgrefurl=http://www.insaneanimals.com/tunn	03/02/2005 15:01
	http://images.google.co.uk/imgres?imgurl=http://www.insaneanimals.com/items/177.jpg&imgrefurl=http://www.insaneanimals.com/tunn	03/02/2005 15:01
Young Chicks - Funny Animals, Pets, Cats and Dogs Pictures - Insane Animals	http://www.insaneanimals.com/funny-animals/177.html?sort=date	03/02/2005 15:01
	http://pagead2.googlesyndication.com/pagead/ads?client=ca-pub-2066660325911329&dt=1107442877733&format=120x600_as&output=	03/02/2005 15:01
	http://media.fastclick.net/w/get.media?t=n&sid=13470&m=3&l=b&v=1.4&c=7098&r=http%3A//images.google.co.uk/imgres%3Fimgurl%3D	03/02/2005 15:01
Google Search: young chicks	http://images.google.co.uk/images?q=young+chicks&hl=en&lr=&client=firefox-a&rls=org.mozilla:en-GB:official_s&start=20&sa=N	03/02/2005 15:01
	http://www.cvm.okstate.edu/instruction/kocan/ostrich/ostbk2b2.htm	03/02/2005 15:02
	http://images.google.co.uk/imgres?imgurl=http://www.cvm.okstate.edu/instruction/kocan/disk2/images/img0056.jpg&imgrefurl=http://ww	03/02/2005 15:02
Google Image Result for http://www.cvm.okstate.edu/instruction/kocan/disk2/images/img0056.jpg	http://images.google.co.uk/imgres?imgurl=http://www.cvm.okstate.edu/instruction/kocan/disk2/images/img0056.jpg&imgrefurl=http://ww	03/02/2005 15:02
Google Search: young chicks	http://images.google.co.uk/images?q=young+chicks&hl=en&lr=&client=firefox-a&rls=org.mozilla:en-GB:official_s&start=40&sa=N	03/02/2005 15:03
	http://images.google.co.uk/imgres?imgurl=http://people.cornell.edu/pages/sah67/chicks2.jpg&imgrefurl=http://people.cornell.edu/pages/	03/02/2005 15:03
Eco Gallery '04	http://people.cornell.edu/pages/sah67/summer.html	03/02/2005 15:03
Google Image Result for http://people.cornell.edu/pages/sah67/chicks2.jpg	http://images.google.co.uk/imgres?imgurl=http://people.cornell.edu/pages/sah67/chicks2.jpg&imgrefurl=http://people.cornell.edu/pages/	03/02/2005 15:03

Appendix 4 – "MRB Access of 3rd February 2005"

file/birds/audio/aggressive_song.wav	2005-02-03 12:22:51 GMT
file/EvanstonWoodpecker.jpg	2005-02-03 14:14:59 GMT
file/Documents%20and%20Settings/All%20Users/Documents/My%20Music/Sample%20Music/Doc1.doc	2005-02-03 14:17:48 GMT
file/birds/Killdeer.jpg	2005-02-03 14:49:29 GMT
file/Documents%20and%20Settings/johndoe/My%20Documents/My%20Pictures/babyscot_vyoung.jpg	2005-02-03 15:00:19 GMT
file/Documents%20and%20Settings/johndoe/My%20Documents/My%20Pictures/babyscot_2weeks1.jpg	2005-02-03 15:00:27 GMT
file/Documents%20and%20Settings/johndoe/My%20Documents/My%20Pictures/177.jpg	2005-02-03 15:01:38 GMT
file/Documents%20and%20Settings/johndoe/My%20Documents/ostbk2b2.htm	2005-02-03 15:02:45 GMT
file/Documents%20and%20Settings/johndoe/Desktop/birdtrans2.jpg	2005-02-03 15:04:48 GMT
file/Documents%20and%20Settings/johndoe/My%20Documents/My%20Pictures/chicks2.jpg	2005-02-03 15:05:03 GMT
file/Documents%20and%20Settings/johndoe/My%20Documents/newbies2.jpg	2005-02-03 15:05:44 GMT
file/Documents%20and%20Settings/bob/My%20Documents/My%20Music/ready2fledge.jpg	2005-02-03 15:06:42 GMT
file/birdwatching.doc	2005-02-03 15:49:39 GMT
file/birds/non%20images/BookList.doc	2005-02-03 15:51:54 GMT
file/birds/non%20images/BirdingGuide.pdf	2005-02-03 15:52:01 GMT

Appendix 5 – Browser activity on 9th February 2005

Google Search: bird screensavers	http://www.google.co.uk/search?client=firefox-a&rls=org.mozilla%3Aen-GB%3Aofficial_s&hl=en&q=bird+screensavers&meta=&btnG=Goo	09/02/2005 11:27
Screensavers	http://www.traveltex.com/screen.asp?SN=6245300&LS=0&SS=1	09/02/2005 11:27
Screensavers	http://www.traveltex.com/screen.asp?SN=6245300&LS=0&SS=1	09/02/2005 11:27
	http://www.trav+B3:B171eltex.com/downloads/screensavers/birds.zip	09/02/2005 11:27

Appendix 6 – "MRB Access of 9th February 2005"

file/Documents%20and%20Settings/johndoe/My%20Documents/birds.zip	2005-02-09 11:28:00 GMT
file/Documents%20and%20Settings/All%20Users/Documents/My%20Music/Sample%20Music/Doc1.doc	2005-02-09 11:28:01 GMT
file/Documents%20and%20Settings/johndoe/My%20Documents/My%20Pictures/7107298.jpg	2005-02-09 11:28:01 GMT
file/Documents%20and%20Settings/johndoe/My%20Documents/kakapo.ram	2005-02-09 11:28:01 GMT
file/Documents%20and%20Settings/johndoe/My%20Documents/My%20Pictures/40m.jpg	2005-02-09 11:28:01 GMT
file/Documents%20and%20Settings/johndoe/My%20Documents/My%20Pictures/177.jpg	2005-02-09 11:28:01 GMT
file/Documents%20and%20Settings/johndoe/My%20Documents/nestboxtips.txt	2005-02-09 11:28:01 GMT
file/Documents%20and%20Settings/johndoe/My%20Documents/aa010703a.htm	2005-02-09 11:28:01 GMT
file/Documents%20and%20Settings/johndoe/My%20Documents/My%20Pictures/tn_duck_3.jpg	2005-02-09 11:28:01 GMT
file/Documents%20and%20Settings/johndoe/Desktop/birdtrans2.jpg	2005-02-09 11:28:01 GMT
file/EvanstonWoodpecker.jpg	2005-02-09 11:28:01 GMT
file/Documents%20and%20Settings/johndoe/My%20Documents/My%20Pictures/babyscot_vyoung.jpg	2005-02-09 11:28:01 GMT
file/Documents%20and%20Settings/johndoe/My%20Documents/My%20Pictures/babyscot_2weeks1.jpg	2005-02-09 11:28:01 GMT
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Appendix 7 – "Images from GPG File"

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E^%@%birds@%birdpics@%WhiteFacedHeronFlying

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Appendix 8 – All Documents

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UNIVERSITY of CALIFORNIA
BOTANICAL GARDEN
NEWSLETTER

Volume 26, Number 2 Published by the UNIVERSITY OF CALIFORNIA BOTANICAL GARDEN at Berkeley, California Spring 2001

Birds at the UCBG

Aloes in the Southern African Area attract hummingbirds and demonstrate how birds at the Garden enjoy the diversity of plants in this collection.

"It's a hummingbird! But is it Anna's, Allen's or Rufous?"

Academic interest in the Garden's bird life over the last few years has primarily been associated with undergraduates studying the territorial behavior of hummingbirds. Any regular Garden visitor can tell you however, that you've never really experienced the Garden until you have taken the time to sit and just watch the birds, listen to their songs and enjoy the way in which they use the Garden! Encouraged by the vast plant variety and habitat diversity, there are around seventy-six bird species regularly sighted here over the course of an average year. The hope of spotting one of the more rarely sighted birds, such as the Western Kingbird or the White-throated Swift, keeps our endless parade of avid birdwatchers in thrall.

Our resident birds, however, whether it's an audacious jay, a noisy woodpecker or a colorful finch, provide plenty of ongoing interest for the Garden community.

The diverse collections of the Garden support an equally diverse population of birds, as is apparent in the list from the recent Christmas Bird Count. In addition to providing general shelter for both resident and migrant species, our collection provides food and nesting sites for many different taxa. The Garden environment offers a range of habitats that are rather different from the native chaparral of the canyon. Some visitors to the Japanese Pool, such as belted kingfishers and green and blue herons, might not otherwise stop in Strawberry Canyon. Native chaparral species are found in parts of the Garden that more closely approximate their preferred habitat. Wren tits, California thrashers, and spotted towhees are most commonly found in the scrubby areas of the South American and Australasian sections. Similarly, native riparian species are found in the trees along Strawberry Creek, such as Wilson's and orange crowned warblers.

Many birds have identified new food sources among the many non-native plants in our collections. This is particularly obvious when watching hummingbirds feed on both native salvias and penstemons, and also on bird-pollinated plants from other parts of the world. Aloes in the Southern African Area are pollinated by sun birds in their native habitat. These small colorful nectivores perch on the rigid blossom stalks of the aloes. This is a distinct contrast to the hovering feeding habit of the hummingbirds, which as a group are restricted to North and South America. Nonetheless, as a walk through this area at this time of the year demonstrates, hummingbirds utilize aloes extensively and assertively defend their feeding resources against other intruding hummers.

—*Chris Carmichael*

When not watching birds from the Elizabeth Hammond Interpretive Center, where he is pictured here, noted local ornithologist Dennis Wolff, regularly teaches popular birdwatching classes in the Garden.

From Killing to Counting

Before 1900, Americans engaged in a holiday tradition known as the Christmas "Side Hunt". People would choose sides and go afield with their guns; whoever brought in the biggest pile of feathered quarry won. On Christmas Day 1900, ornithologist Frank Chapman, an early officer in the Audubon Society, called for an end to the slaughter. Rather than shooting birds, he suggested counting them. From Toronto to Pacific Grove, California, the Christmas Bird Count began. In its first year, 27 people participated, counting 18,500 individual birds of ninety species.

On Christmas Day 2000, 52,000 people participated in 1800 counts in the United States and Canada. They sighted 78,636,382 individual birds of 676 species! A century of bird counts has amassed a wealth of data which scientists use to monitor the health of bird species, pinpoint and explain trends, and detect the rise of environmental threats.

Along with three other members of the Audubon Society, I came to the rich and varied habitats of the UC Botanical Garden for this annual count. We found a total of 226 individual birds of 38 species, including such rarities as hermit and black-throated warblers.

—*Dennis Wolff*

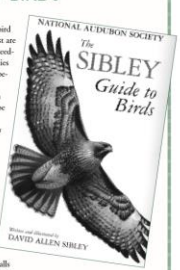
AUDUBON CHRISTMAS COUNT
DECEMBER 17, 2000

American Robin	30
Anna's Hummingbird	25
Steller's Jay	21
Bushtit	16
Golden-Crowned Kinglet	14
Ruby-Crowned Kinglet	12
Yellow-Rumped Warbler	10
Townsend's Warbler	9
Western Scrub-Jay	9
Chestnut-Backed Chickadee	7
Hutton's Vireo	7
Song Sparrow	6
California Towhee	5
Golden-crowned Sparrow	5
Bewick's Wren	4
Fox Sparrow	4
Dark-eyed Junco	4
Turkey Vulture	3
Hermit Thrush	3
Allen/Rufous Hummingbird	3
Common Raven	3
Band-Tailed Pigeon	2
Northern Flicker	2
Black Phoebe	2
Red-breasted Nuthatch	2
Brown Creeper	2
California Thrasher	2
Spotted Towhee	2
White-crowned Sparrow	2
Cooper's Hawk	1
Sharp-shinned Hawk	1
Red-breasted Sapsucker	1
Nuttall's Woodpecker	1
Hairy Woodpecker	1
Wrentit	1
Black-throated Gray Warbler	1
Hermit Warbler	1

Dr. Chris Carmichael, UCBG Manager of Collections and Horticulture, is one of our noteworthy birders, a group which also includes Dr. Jennifer White, Associate Director for Education, and Curator Holly Forbes. Chris' academic background in vertebrate zoology equips him to effortlessly make the connections between the birds here in the Garden and their relationships to the plants.

SIBLEY'S GUIDE TO BIRDS

National Audubon Society: The Sibley Guide to Birds, written and illustrated by David Allen Sibley; A Chanticleer Press Edition, Alfred A. Knopf, NY, ©2000; 544pp. Flexible Binding. $35.00.



Most visitors to the Garden come to see and study our special plants, but a surprising number also come to see the animals and birds which feed and take shelter in the hospitable environment. We have newts which breed yearly in our Japanese Pool and monarch butterflies visiting our milkweed plants. Now and again we are surprised to learn that we are on the Audubon Society's Hotline, as we were several years ago when dozens of visitors came to see a rare bird sighted in the southwest corner of the Garden.

In past years, the Roger Tory Peterson *Field Guide to Western Birds*, or the National Geographic Society's *Field Guide to Birds of North America*, were seen tucked under the arms of our 'Garden Birders'. Now there is a new, up-to-date field guide these birders will want to own, although its size and weight make it awkward to carry in the field.

The Sibley Guide to Birds is a great user-friendly guide containing over 6600 wonderfully detailed watercolor paintings of 810 species and 350 populations of North American birds. Descriptions and remarks accompany the illustrations, removing the need to flip back and forth between text and pictures. The birds are shown in similar poses to make comparisons between species easy. All important plumages are depicted and range maps show migration routes, summer, winter, and breeding locations, and bird distribution. Of particular interest are the good introductory pages preceding each family or group of families showing bird classification and speciation at a glance.

In many ways the publication of *The Sibley Guide to Birds* can be compared to the publication of *The Jepson Manual: Higher Plants of California* a few years ago. Both were preceded by respected long-used references. It is likely that the *Sibley Guide* will become the current authority for birds, as the *Jepson Manual* has become for plants. But keep your worn, well-loved field guides handy. For this reader, at least, it is hard to think that the beloved California Quail in the Garden calls "put-way-do" rather than the familiar "chi-ca-go" of old, which we teach the touring school children.

The Garden Shop also carries the following books related to the above review:

- *Birds of Northern California* by David Fix and Andy Bezener; range maps by Don Roberson and David Fix; Lone Pine Pub., Renton, WA,©2000; 384pp. Paper. $19.95.
- *Birds of San Francisco and the Bay Area*, by Chris C. Fisher and Joseph Morlan; Lone Pine Pub., Renton, WA, ©1996; 159pp. Paper. $9.95.
- *Common Dragonflies of California, A Beginner's Pocket Guide*, by Kathy Biggs; Azalea Creek Pub., Sebastopol, CA, ©2000. 96pp. Paper. $9.95.
- *Newts and Salamanders, Everything about Selection, Care, Nutrition, Diseases, Breeding, and Behavior*, by Frank Indiviglio; with photos by Richard D. Bartlett; illus. by Michele Earl-Bridges; Barron's, Hauppauge, NY, ©1997; 128pp. Paper. $6.95.

Brochures:

- *Birds of the UC Botanical Garden*, UC Botanical Garden Staff. $1.00.
- *Butterflies of the San Francisco Bay Region, A County Species List*, 5th ed., by John Steiner; San Francisco Bay Wildlife Soc, 1988. $1.00.

—*Elly Bade*

DIRECTOR'S COLUMN

Celebrating the Garden

Spring is here again! The hills are green and spangled with flowers. The wind is whipping across the coastal bluffs, and anyone with even the slightest inclination toward gardening has their hands in the soil. As I watch the seasons march across the landscape and think back to the past year, I'm amazed at the amount of progress we have to celebrate here at the Garden.

The living collection is in superior condition. Over the years, the horticultural staff has done an inspired job of maintaining and building the collection. However, with leadership by Manager of Collections and Horticulture, Chris Carmichael, and better access to materials and supplies, they have added new shine to the Garden. I invite you to push past the construction sites in the entrance to get a better look!

Ah, yes, those construction sites. We were so excited when they started. Now, we look forward eagerly to their completion. The Garden has not been a peaceful place to work or visit this year. Staff and volunteers have been wonderful, carrying out their work over the din of jackhammers, dump trucks, cement mixers, and more. From all this dust, mud, and upset, the Garden is gaining many physical improvements. Some, like the utility upgrades, make our jobs easier but are invisible to visitors. Others, such as renovated bathrooms and FEMA restoration of pathways in the Mexican and Central American area, are essential but not sensational. Many projects, though, are downright sensational!

Master rock garden creator, Phil Johnson, has just completed a spectacular hardscape in the Southern African section, and horticulturist Lawrence Lee will soon begin planting it with material obtained during his collecting trips to South Africa. This garden will feature the natural beauty of bulbs and succulents from the winter rainfall areas of the Karoo and Fynbos semi-arid and desert habitats. It also provides an opportunity to inform visitors about the precarious situation of these habitats in the face of regional development and global climate change.

Our new Arid House is also nearing completion. The name has recently been changed to Arid House from Desert Greenhouse — Arid House being more appropriate for that collection, though we are still making the name transition. This structure will house a substantial number of the most biologically and scientifically valuable plants in our collection, including many living "type" specimens. Type specimens are the exemplar individuals a taxonomist uses to describe a new species. Other specimens belong to species that are now extinct in the wild, and are therefore irreplaceable. The new house provides the public with excellent visual access to the exciting and unusual plant forms in this collection while ensuring their security.

UC researchers are anxiously awaiting opening of the Center for the Study of Plant Conservation (CSPC) at the Garden. Although the lab is not yet finished, scientists associated with this center are already exploring a diversity of questions related to plant conservation. Richard Shefferson, a graduate student at the Center, writes in this issue about his research devoted to discovering the types of fungi that sustain terrestrial orchids. Another graduate student, Jessica Riquetti, recently established a major field experiment to determine whether soil-borne organisms can limit the spread of European beach grass, an invasive species that reduces native plant diversity in sand dunes along the Pacific coast of North America. Work by these students and other scholars will be greatly facilitated by the new Center.

In preparation for our next round of construction, we have just begun design of the Jane Gray Research Greenhouse, which will be an important adjunct of Garden research in plant conservation and ethnobotany. This house will be erected in the place currently occupied by the temporary arid house and will serve researchers from both the CSPC and elsewhere on the Cal campus.

Although construction is the most visible sign of progress that visitors can see, the Garden has many other achievements to celebrate as well. Our educational outreach programs are receiving national recognition. Many partners are joining our Math in the Garden initiative. Beginning this spring staff at the UC Davis Arboretum, Brooklyn Botanic Garden, Missouri Botanical Garden, Morris Arboretum, and Atlanta Botanical Garden become active partners in the development process of the 'Math in the Garden' project as they try out the activities in their own programs. San Francisco Girl Scout Council troops and 4-H programs across California are also partners in this effort. Over the next year their evaluations of the effectiveness of the project's activities will provide crucial information to ensure that the final published materials will fit into different informal settings and programs and work in gardens throughout the country. Collaborations with these, and other partners, provide audiences diverse program opportunities that strengthen this and other aspects of the Garden's Education Programs.

Cactus drawings by UCBG horticulturist, Judith Finn. Above: Gymnocalycium saglione *and at right:* Euphorbia cf. leuconeura.

Our collaboration with East Bay Munipal Utility District, which resulted in our spectacular and innovative contribution to last year's San Francisco Flower and Garden Show, is now producing exciting new Garden interpretation materials. Garden staff and dedicated volunteers worked with EBMUD staff to develop an extensive and well-received tour of Plants for Water-wise Gardening. (See the Education Director's column for more information about this tour.) The tour takes advantage of our diverse and outstanding collection to illustrate landscape uses of water-conserving plants. Most species highlighted in the tour are available in the horticultural trade, but some are not, which puts the tour on the leading edge of horticultural innovation.

Through all of these changes, the Garden continues to expand its primary mission of support for botanical research. New molecular tools are allowing exciting discoveries in evolutionary biology and plant systematics. These tools work best on DNA extracted from live tissues, which makes living collections such as ours ever more important scientifically. Important new studies that have used UC Botanical Garden specimens are finding exciting and sometimes disturbing results. For example, Olmstead, DePamphilis, Young, and colleagues report this spring in the *American Journal of Botany.* (Vol. 88: 348-361, 2001) that the snapdragon family (Scrophulariaceae) is not a natural evolutionary grouping. In their new interpretation, which was based in part on samples from the UC Botanical Garden, the only member of this family in the California flora that will remain in the Scrophulariaceae is the eponymous *Scrophularia californica*. Even the snapdragons (*Antirrhinum*) will no longer be in the "snapdragon" family.

Although living tissue is the *sine qua non* for molecular phylogenetics, it is still essential that every plant used in such research be vouchered. Vouchering, which involves removing a sample of the plant to produce a herbarium specimen, creates a permanent record that persists after death of the plant itself. It is essential that Garden material be vouchered so that future scientists can examine the specimens that today's botanists are using to classify plants and understand their evolutionary relationships. Thus, an important goal of the Garden is to voucher all accessioned plants in our collection. This academic year, our graduate student assistant, Rich Shefferson, has helped to voucher 274 plants in our collection.

With all this happening this year, one might ask whether Garden staff has had time to plan very far into the future. In fact, we have embarked on the early stages of strategic planning and, as the first round of construction nears completion, we will continue to move forward on this very important project.

—Ellen Simms

Garden Visitors

(left to right): Horticulturist Elaine Sedlack accompanied Mark Flanagan, "Keeper of the Gardens" at Windsor Great Park, and William McNamara, director of Quarryhill Botanical Garden in Glen Ellen, CA, during their visit on April 16th. Mr. Flanagan was the April speaker for the California Horticultural Society meeting.

Gardening Tips

■ The larvae of the diamond back moth can be a serious pest for members of the cabbage family, including cabbage, broccoli, collards, kale and others. The insects are becoming resistant to Bt, which has been used widely to control the insect. A researcher in Florida found that the larvae of the moths prefer feeding on highly fertilized collards more than on any other members of the family. Fields of crucifers to be protected are surrounded by a crop of specially treated collards, resulting in a reduction of sprays from 75 to 100%. In addition, a naturally occuring parasitic insect of diamond backs built up in the collards, and this helped control them in the desired crop. *Agricultural Research* 47 (3): 26.

■ The old world fern, (*Lygodium microphyllum*), introduced into Florida in 1950, now covers over 40,000 acres. In the last 6 years, there has been a 100 fold increase. A single leaf can be 100 feet long. Fortunately, it is believed that the plant will not move farther north than central Florida. *American Nurseryman* 191 (3): 10.

■ *Euphorbia esula*, an introduced species in the northern midwestern states, has colonized vast areas of marginal and non-agricultural land, displacing many beneficial plant species. In addition, it is toxic to sheep, cattle and horses. Recently, a gall midge was released which produced galls on the stem tips resulting in their destruction, thus preventing flowering and seed production. The insect may produce 3 or 4 generations in a season though the first generation produces the largest number of adults. It is these that can be harvested and used for new releases. *Biological Control* 16(2): 128-132.

—Robert D. Raabe

The Overlooked Equation

When I was an undergraduate living in Chicago, I volunteered at local country nature preserves to help restore Illinois' endangered prairies, savannas, and wetlands. Very often, my work involved monitoring the endangered plants that grew in the area, especially the imperiled populations of native, wild lady's slippers.

The lady's slippers we all know and love *(Paphiopedilum spp.)* are tropical, and have been propagated and hybridized for many years. Should you ever see a lady's slipper of the genus *Cypripedium* on display at a nursery, be warned – it was most likely stolen from the wild. Cypripedioid lady's slippers grow on the wild lands of North and Central America, Europe, and Asia, and have not been propagated successfully at all. Yet, as we have seen in other endangered plants, propagation is very often integral to successful restoration.

Why has propagation been so unsuccessful? The biology of orchids, especially the rare terrestrial orchids that evolved in the temperate regions of the world, is very complex. In fruiting structures known as pods, they produce thousands to millions of seeds no longer than a single millimeter, and half that in width. These seeds very rarely survive to produce a mature plant, and this seems to be why they have evolved to produce so many seeds all at once. The seeds scatter in the wind and find a new place to settle in the soil. Once the winter snows and rains are over, they imbibe water, and then they just sit. Why? Because they cannot progress any further in their development without the aid of a soil-inhabiting fungus. The orchid family is one of the few plant families that depends completely on soil fungi for germination. This kind of interaction is called "mycorrhizal," and requires some more explanation.

This Cypripedium californicum *in the Garden was collected by Garden horticulturist, Roger Raiche.*

A mycorrhiza is an interface of two organisms – a plant and a fungus. The fungus, which can be one of many different species, grows through the soil as a mass of tiny filaments known individually as hyphae, forming a hyphal network called a mycelium. The fungus grows outward, looking

GARDEN NOTES

SUDDEN OAK DEATH…Horticulturists **Judith Finn** and **Jerry Parsons** attended an all day symposium, "Combating the Sudden Oak Death *Phytophoras*: a new disease", in Marin County, hosted by UC Cooperative Extension on March 9th.

CHANNEL ISLAND VISIT…Horticulturist **Nathan Smith** accompanied **Steven Junak,** of the Santa Barbara Botanic Garden, on a three-day visit to San Nicolas Island in late March. This island is part of the southern group of Channel Islands off the coast of southern California. They were conducting plant surveys and removing exotic plants. Nathan was able to collect several plants for the Garden's Californian Area.

GARDEN SHARING…Curator **Holly Forbes**, distributed duplicates of the Garden's epiphytic cactus collection to the Huntington Botanical Gardens in San Marino and to Ganna Walska Lotusland in Santa Barbara. It is common practice among gardens to share duplicates of collections, providing some protection against loss in any one location. **John Trager**, Curator of Desert Collections at the Huntington, donated several collections of South African material for the Garden's African Area.

RESEARCH GRANT…We are pleased to report that the Genetic Resources Conservation Program at UC Davis funded a grant proposal by **Dr. Jason Koontz** and Holly Forbes to study the genetic variability of Baker's Larkspur, *Delphinium bakeri*. The research will seek to determine the genetic diversity of this species to obtain base-line data for future research and conservation efforts. The grant money will pay for the cost of DNA analyses to be performed by Dr. Koontz. Baker's

for new patches of resources to digest and absorb. Part of the mycelium grows into the root system of a plant, penetrating the root tissue itself, and "colonizes" it. Other parts of the same mycelium grow far beyond the range of the plant's root system, and collect nutrients such as phosphorus and calcium. Amazingly, the mycelium then gives the plant vast quantities of these nutrients, which are very often limiting to the plant's growth. But the fungus does not do this out of the goodness of its fungal heart! It gets a very valuable commodity from the plant: carbon. The plant produces sugar in its photosynthetic leaves, and it now appears that, on average, at least 20% of all the sugar produced by the plant goes to the fungus. This makes sense: the plant is limited much more by phosphorus, calcium, and other nutrients than carbon. Hence, the fungus and the plant seem to exist in a mutually beneficial system.

The importance of mycorrhizae is evident in the fossil record, which shows that the first land plants (now thought to be *Rhynia* species), growing roughly 500 million years ago, actually had mycorrhizal structures in their roots. Indeed, current estimates suggest that 90% of plants are mycorrhizal – a situation that clearly displays the importance of this unusual interaction.

Which brings us back to the orchid. Orchids are unlike any other plants. We are discovering that this is true in their biology as well as in their aesthetics. Orchids break all the rules. With most plants, germination and growth are possible without fungi, although the plant will generally be stunted throughout its life. But orchids do not appear to grow without these organisms. Although some orchids can be cultivatable in the lab under very specific conditions, these orchids generally grow poorly relative to their wild-grown kin. More and more we find that most orchids cannot even germinate without a fungus.

Why should this concern us? The kind of interaction that orchids exhibit with mycorrhizal fungi is very different from what we are used to, and this has important ramifications for propagation, and ultimately restoration. First of all, we have as yet not seen any evidence that orchids donate carbon to the fungus. Second, we have found that as seedlings, and in the case of the non-photosynthetic "ghost" and "phantom" orchids, orchids even extract sugar from the fungus! Third, orchids are very particular about which fungi they will associate with, and it appears that they choose fungi that are mycorrhizal, or sometimes even pathogenic, on local trees and other plants. So, these unusual plants indirectly acquire their sugar from other plants in the ecosystem. Fourth, orchids native to the northern temperate latitudes generally stay within the soil as seedlings for many years without developing any leaves, relying on mycorrhizae for complete nourishment. Finally, even mature, photosynthetic orchids choose not to break the surface and sprout leaves in some growing seasons. This happens particularly often in lady's slipper populations. In my Midwestern study sites, I have found that lady's slippers can stay belowground like this for many years without interruption, while still growing more root and rhizome tissue. Other researchers have found very solid evidence that this "dormant" condition can last for 25 years or more. Considering that lady's slippers have very low sugar reserves, this is an amazing feat.

The key, then, to understanding what can be done to restore native orchid populations, which are in decline all over the world, is to explore this overlooked equation: orchid + appropriate fungus + appropriate conditions = successful growth.

It is an exciting topic. We are now beginning to understand the nature of this puzzling interaction, and modern scientific methods and tools, including molecular techniques, genetic sequencing, carbon-isotopes, and mathematical and statistical theory, are helping us in tackling major environmental questions. My research is an example of the conservation issues which will be investigated by Cal scientists and graduate students at the Garden's new Center for the Study of Plant Conservation.

—Richard P. Shefferson

larkspur is one of several endangered and rare California native plants the Garden is committed to helping conserve through its participation in the Center for Plant Conservation. Dr. Koontz studied the genus *Delphinium* for his dissertation project. He is now at the Center for Biodiversity of the Illinois Natural History Survey.

NEW STAFF MEMBER…

We extend a warm welcome to **Ms. Leslie Wozniak** who has joined the staff at the Garden in the capacity of Visitor Services Specialist. Leslie is a long time fan of the Garden and brings a wealth of work skills to the new position.

EDUCATION AT THE GARDEN

Water-Wise Gardening Tour

One goal of the Education Program is to encourage visitors to discover the Garden's magnificent collection and to look at plants from new perspectives. While our seasonal self-guided tours showcase different plants in their peak flowering or display seasons, other brochures focus on ethnobotanical (Chinese medicinal herbs) or special collections (serpentine plants). Building on the interest generated through our successful collaboration at last year's San Francisco Flower and Garden Show, the Botanical Garden and the East Bay Municipal Utility District (EBMUD) have teamed up again, this time to develop a self-guided tour in the Garden. This interpretive tour of the collection focuses on plants that grow successfully in the Bay Area, but use little water.

The shining silver leaves of Leucadendron argenteum *make it an interesting choice for water conservative landscaping in the Bay Area. Threatened in its native habitat in South Africa it can be seen in the Garden in the Southern African Area, where it is just one of the 125 exciting plants in the new Water-Wise Gardening Tour.*

Most people have no idea how much water their garden needs. The typical Bay Area residential landscape is irrigated enough each year to flood it six feet deep. This is at least twice as much as plants need for healthy growth. Using water-efficient plants and creative design, local gardeners can create a garden that thrives on little more than natural rainfall. Properly designed, a water-efficient garden is easier to maintain than one that is over-watered. It requires less weeding, pruning, mowing, fertilizing, and pest control. It is better adapted to fluctuations in rainfall and seasonal changes. There is no one way to create a water-efficient garden. The Botanical Garden is filled with a plethora of exciting possibilities from around the world.

This walking tour of the Garden introduces you to some of these beautiful plants that thrive in the Bay Area. California's chaparral is our local community of drought tolerant plants. The climate and plant communities in Chile's mattoral, South Africa's fynbos, and the Mediterranean maquis, with their winter rains and summer drought, are but a few of the parts of the world that have water-conserving plants similar to California's chaparral. Most of the plants on this tour have been in our collection for many years. They will give you a good idea of what that seedling in the local nursery will look like once it gets established in your garden.

This new publication is the collaboration of the Garden's horticultural, educational and communications staff working with three knowledgeable and dedicated docents — Barbara Lyss, Kathryn Welch and Alison Mills. After hours of walking through the Garden and conversations with horticulturists, Barbara, Kathy and Alison wove fascinating plant histories, horticultural information, name derivations and ethnobotanical information into stories for more than 100 plants. A lot of give and take occurred as the Garden staff vetted the information from different perspectives. Weeding out some plants that we all loved but which did not fit all the criteria was one of our biggest problems. Plants included on the tour use little water, are available (or could be available) in the horticulture trade, and are not weedy or endangered.

Ten thousand preview versions of the tour are available this Spring: in the Garden, at this year's San Francisco Flower and Garden Show and at Earth Day events. Over the next several months, Education staff will be collecting evaluations from visitors. This information will be used to improve the final version of the brochure. I invite you to come to the Garden, go on the tour, and give us your feedback.

We are grateful for EBMUD's participation and support of the process and production of this new exciting self-guided tour of the Garden.

—Jennifer Mesa White

Research at the Garden

The Garden recently provided research materials to these individuals:

Ms. **Eden Abram**, dissertation student with Prof. **Donald Kaplan**, UCB Dept. of Plant Biology launched her study of comparative morphology of succulent, drought-tolerant plants. She will be using the desert collections for illustration purposes.

Prof. **David D. Ackerly**, Stanford University, again visited to collect many species in the Rhamnaceae (buckthorn family). He is looking at the evolution of the "evergreen sclerophyll" strategy in California chaparral. The project is to examine each of the major taxa in comparison with their close relatives from non-chaparral habitats, employing a phylogenetic approach where possible.

Dr. **Stephen Burgess**, post-doc, UCB Dept. of Environmental Science, Policy, and Management, used the Mather Grove for an investigation of the basic physiological ecology of redwoods with the aim of relating climatic and hydrological factors with the growth and distribution of *Sequoia sempervirens* (Coast Redwood). They are particularly interested in quantifying direct foliar absorption of fog water by redwoods and determining its role in mitigating drought and allowing redwoods to grow to extreme heights. This study will principally involve the use of sensitive xylem sap flow meters to gauge patterns and amounts of water transport in branches and stems of redwoods.

Prof. **Todd Dawson's** class, Physiological Plant Ecology, used several Garden plants for measurements of photosynthesis under sun and shade conditions during the Spring Semester.

Prof. **James Eckenwalder**, University of Toronto, received leaf bases of *Zamia integrifolia*. These were plants used by Dr. Robert Ornduff for a study published in 1996: Gender performance in a cultivated cohort of the cycad *Zamia integrifolia* (Zamiaceae). *Amer. J. Bot.* 83: 1006-1015.

Mr. **Taylor Field**, dissertation student at Harvard, visited to take cuttings of primitive angiosperms for his project *(Chloranthus, Illicium mexicanum, Illicium simonsii, Schisandra henryi).*

Ms. **Ruth Kirkpatrick**, dissertation student with Prof. **Brent Mishler**, UCB Dept. of Integrative Biology, received fronds of several xerophytic ferns for a course project on dessication tolerance.

Ms. **Nancy Kiang**, dissertation student with Prof. **Dennis Baldocchi**, UCB Dept. of Environmental Science, Policy, and Management, tested a sap flow sensor on a Garden oak for several weeks prior to using it in the field.

Ms. **Jessica Messmer McAbee**, graduate student at UC Davis with Prof. **Charles Gasser**, visited to obtain cuttings of *Impatiens hookeriana* and *Impatiens balsaminifera* for her graduate studies in ovule diversification in the angiosperms.

Dr. **Susana Magallon**, UC Davis, post-doc with Profs. **Michael Sanderson** and **James Doyle**, received a wide range of species for their study of seed plant phylogeny, the age of angiosperms, and the evolution of pentamery among basal eudicots.

Ms. **Jodi McGraw**, dissertation student with Prof. **Wayne Sousa**, in Integrative Biology completed her soil seed bank study in the Garden's research greenhouse.

Prof. **Rei Rasmussen**, Oregon Graduate Institute in Beaverton, Oregon, visited the Garden to collect emissions from several oak species for his study on terpene release by oaks.

Mr. **Andrew Salywon**, dissertation student at Arizona State University, is working on the molecular systematics of the Myrtaceae family. He received cuttings of *Eugenia capuli, Austromyrtus dulcis, Myrcuegenia chrysocarpa, Syzygium jambos,* and *Ugni molinae.*

Ms. **Caroline Stromberg,** dissertation student at UC Berkeley, Department of Integrative Biology, received dozens of specimens and associated herbarium vouchers for development of a phytolith reference collection.

Dr. **Nori Yoshikawa,** a post-doc at the University of Washington in Seattle, visited to collect *Hibberia scandens, Dillenia,* and *Aextoxicon punctatum.* His main object is to find where in the phylogeny of angiosperms particular genes (the RPB2) are duplicated.

—Holly Forbes

Recognition

Contributions received from 2/01/2001 up to and including 4/15/2001.

New Members

The Garden wishes to thank our new Individual and Family Members:

Ms. Shellie Albright & Mr. Scott Emmett
Mrs. Monica Baldzikowski
Ms. Marge W. Barry
Mrs. Wendy S. Bergman & Mr. Robert G. Bergman
Ms. Barbara Boster
Ms. Suzanne M. Briley
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Dr. and Mrs. Daniel Callahan
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Mr. Sam Fosabee
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Mrs. Laura Miller & Mr. Dave Miller
Mr. Charles L. Moreau
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Ms. Anita L. Thomas
Mr. Dan Vieira
Ms. Virginia C. von Colditz
Mr. Whitney Vosburgh
Ms. Herta Weinstein
Ms. Karen Wessen
Ms. Charlotte Woody

Grateful Thanks

The Garden thanks these new members for their substantial gifts over and above membership:

Ms. Patti Barker
Mr. and Mrs. David Benning
Ms. Beth Burnside
Mr. and Mrs. Ronald Clendenen
Mr. and Mrs. Fred Dengler
Mr. and Mrs. Jack Dalkissoon
Dr. and Mrs. A. Carl Helmholz
Ms. Fonda Kaetler
Mr. and Mrs. Ron Lai
Mr. Jim Lowekin & Prof. Iris Tintemelein
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Mr. and Mrs. Stuart McDonald
Mr. Bill Mcjohn
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Ms. Sally O'Connell
Ms. Ann Reynolds
Mr. and Mrs. Weldon Rucker
Mr. Bernard Taper & Ms. Gwen Head
Ms. Carol Thompson & Mr. Roderic Duncan
Mr. and Mrs. William D. Watkins
Mr. Stewart Winchester
Mr. Thomas (Rex) Wolf

In Appreciation

The Garden offers appreciation and thanks to these donors for their generous contributions:

Mr. and Mrs. Earl Hamlin
Dr. and Mrs. A. Carl Helmholz
Mr. Bernard Taper & Ms. Gwen Head
Mr. Stewart Winchester
(Orudolf Fund for Garden Interpretation & Docent Activities)

In Memory

The Garden offers appreciation and thanks for gifts from these donors in memory of:

Shih Ning Chern from:
Mr. & Mrs. Kenneth Palladino
(Chinese Medicinal Herb Garden)

Jean & Earl Hyde from:
Mr. and Mrs. Harry Heckman
(Myrtle Wolf Library)

Josephine Tonge Larson from:
Mr. and Mrs. Bill Bade
(Myrtle Wolf Library)
Ms. Ellen Felker
Ms. Elenor Mulkey
Ms. Mildred J. O'Connor
Ms. Jean Portello
Ms. Jacqueline Woodfill & Mr. John Woodfill
(Myrtle Wolf Library)

James Harrold Van Sicklen from:
Mr. and Mrs. Richard Amundsen
Mr. and Mrs. Bill Bade
(Entrance Improvements)
Mr. Michael Gilmore & Family
Mr. Bruce Hayes
Mr. & Mrs. R. Sheldon Milligan, Jr.
Mr. John P. Stack

Gifts In Kind

The Garden offers appreciation and thanks for gifts in kind.

Ms. B. Sonja Altena
Ms. Mary Lynn Cox
Ms. Louise Dutton
Mrs. Myrtle Wolf

WISHLIST

The Garden particularly thanks Dr. and Mrs. David Reiffel for their contributions of a sofa and a projector for the new Center for the Study of Plant Conservation.

This issue we are asking our readers if they could support us by donating:

- A "point and shoot" camera
- Card tables

If you can donate, please call (510) 643-2937—we would appreciate the help.

Pictured after receiving their awards from the Director at the recent ceremony are: (Back, left to right) John Domzalski, Judith Finn, Jerry Parsons, Peter Klement, Gerald Ford. (Front, left to right) Elaine Sedlack, Nancy Swearengen, Holly Forbes and Dr. Ellen Simms, Garden Director.

Staff Members Honored

Various members of the Garden staff were recently recognized and applauded for their many years of service. Director Ellen Simms commented that the Garden is the envy of many campus units for the longevity of its staff! University service award pins were given to **Holly Forbes, Gerald Ford, Jerry Parsons** and **Nancy Swearengen** for 10+ years of service; to **Elaine Sedlack** for 15+ years; to **Peter Klement** and **Roger Raiche** for 20+; and to **John Domzalski** for 25. **Judith Finn** had already received her 25-year pin! Congratulations to all you long-timers!

Noteworthy Donations…

The Garden Library received several donations of books and journals. **Mrs. Mary Lynn Cox** donated over 130 books on garden design, horticulture, and botanical subjects. **Mrs. Myrtle Wolf**, donated a complete run of *Pacific Horticulture Magazine*, many issues of the *Journal of the California Horticultural Society*, several volumes of the *Bulletin* of the American Rock Garden Society, the early issues of *The Four Seasons* (journal of the Regional Parks Botanic Garden), and *Fremontia* (journal of the California Native Plant Society), among others. Additional donations of books for the library were made by **Mrs. Sonja Altena** and **Ms. Louise Dutton.** Thank you very much indeed!

GARDEN STAFF

Dr. Ellen Simms, *Garden Director*

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Afroze Navid, *Administrative Assistant*
Margaret Richardson, *Tour & Rentals Coordinator*
Michael Rimar, *Administrative Assistant*
Candice Schott, *Business Operations Supervisor*
Nancy Swearengen, *Volunteer Services Coordinator*
Janet Williams, *Marketing & Development Officer*
Leslie Wozniak, *Visitor Services Specialist*

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Holly Forbes, *Curator*
Barbara Kellin, *Curatorial Assistant*
Anthony Garza, *Supervisor of Horticulture and Grounds*
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Elaine Sedlack, *Horticulturist*
Nathan Smith, *Horticulturist*
Gerald Ford, *Building and Grounds Maintenance*

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Christine Manoux, *Program Assistant*

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Janet Williams, *Editor*

Administration 642-0849
Development 643-2937
Director's Office 643-8999
Education 495-2805
Entrance Kiosk 643-2755
The Garden Shop 642-3343
Plant Collections 643-8040
Tours/Rentals 642-3352
Volunteers 643-1924
Fax 642-9045
E-mail: garden@uclink4.berkeley.edu
Web Site: http://www.mip.berkeley.edu/garden/

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CALENDAR OF EVENTS

TREES AND SHRUBS OF CALIFORNIA
We are pleased to help launch a new book from University of California Press, Trees and Shrubs of California by two distinguished faculty members from Humboldt State University, John Stuart, Professor of Forestry and John Stewart, Professor of Botany. Both authors will be with us, to share highlights of their research, and to sign copies of their book. Also on hand will be their illustrator, Andrea Pickart, exhibiting samples of her work.
Wednesday, June 13, 7:30 pm
Free
Registration requested

TWILIGHT TOURS
Celebrate the long evenings of summer with us in the Garden. Members of our horticulture staff will share their favorite spots and special insights about the Garden on Wednesday evenings at 5:30 pm. Each walk will be different, so plan to come every week during July, beginning July 11, and every week during August.
Free with Garden admission.

To register for any program or event*, call 510-643-2755.

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The Porter County
Birding Guide

INDIANA DUNES
The Casual Coast

Rose-breasted Grosbeak

Baltimore Oriole

Morning Doves

Welcome to the Casual Coast, along the southern shore of Lake Michigan. Home to the Indiana Dunes National Lakeshore, the Indiana Dunes State Park and the most diversified flora and fauna in the Midwest, the dunes are complemented by several nearby inland nature preserves. Together, they provide a unique haven for birds and birders that will make your stay on the Casual Coast both enjoyable and memorable.

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Photography provided by David Oberst


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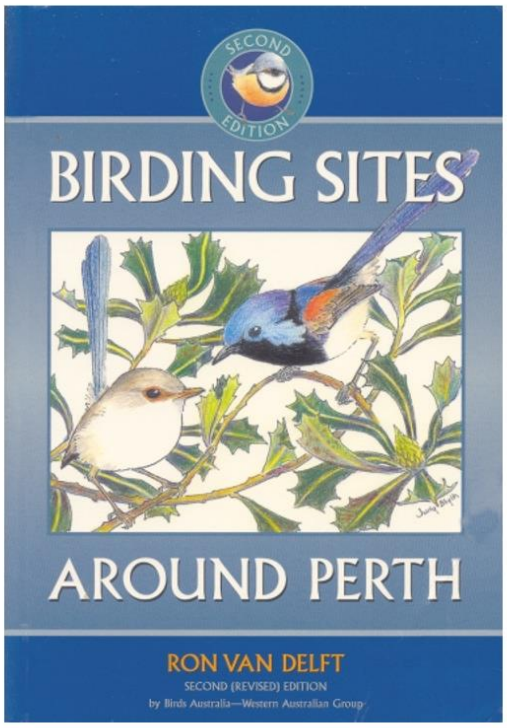

Number 57ab in a series of Bird Guides of Western Australia

Birding Sites Around Perth is a comprehensive guide to Perth's best bird watching sites, including Kings Park, John Forrest National Park and Rottnest Island.

This revised and enlarged edition describes forty-six sites within a 60 kilometre radius of the city, with excellent location maps, lists of birds regularly seen, and notes on species of special interest. Also provided are suggested bird watching tours for local enthusiasts and visitors, and a wealth of information on endemic species. Over 200 birds are featured in 165 pages.

Illustrated throughout with colour photographs and pencil drawings, *Birding Sites Around Perth* is an excellent introduction to bird watching and to Perth's wildlife heritage.

Copies of the book are available for purchase from the Birds Australia office during office hours or available by post.

WHAT IS BIRDS AUSTRALIA?

Birds Australia is a non-profit national organisation working for the enjoyment, study and conservation of Australia's birds. The WA group of Birds Australia has members statewide and offers a variety of activities for members, including conservation and research projects.

Activities and services include excursions, camp-outs, bird surveys and social activities. We also have a library, books for sale and information about birds.

To view our full range of bird guides and bird lists, visit our web site.

INTERESTED?

Contact us at:
Birds Australia Western Australia Inc.
71 Oceanic Drive
Floreat WA 6014 Weekdays 9.30 - 12.30 pm

Phone: (08) 9383 7749
Fax: (08) 9387 8412
Email: birdswa@iinet.net.au
Web: birdswa.iinet.net.au

Birds Australia

An Insider's Guide to Enjoying Your First Birding Field Trip

by Pete Dunne

Field trips are a lot like going to a dance, and there are two schools of thought. You can just waltz onto the dance floor and let the other person lead or you can learn a few basic dance steps beforehand. Here, for those who want to get a jump on etiquette, are some of the basic rules of the birding field trip. Learn them, and you'll spend more time birding and less time tripping over your feet.

• Rule 1 - Never miss an opportunity to use a restroom.

Your capacity for birding may be limitless but your bladder is not. Some leaders are generous with their planned rest stops; some are miserly. Whenever the group arrives at a planned rest stop, take full advantage {and mind your coffee consumption between stops).

• Rule 2 - Familiarize yourself with whatever pre-trip information is sent.

Most organized field trips come with instructions. In the pre-trip material, you will almost certainly find the answers to your most pressing questions: dress, equipment needs, time commitment, lunch plans. Being prepared is the first step toward having a great time.

Re: Clothing. Rule of thumb: In winter, if in doubt, just bring it. In hot weather, cover up for sun protection-this means hat, long-sleeved cotton shirt, long pants. At any time of year, avoid bright colors, particularly white. In the universal language of wild creatures, white means "Danger! Watch Out! Hide ! It's not the message you want to send.

• Rule 3 - Don't be late.

When you join a group, you sacrifice a measure of self-determination. One of the quickest ways to annoy the group leader and everyone else, is to arrive late and delay the group's departure.

• Rule 4 - Don't wander off.

The second quickest way to annoy the group leader is to wander off. You don't want to be left behind and you don't want to be the focus of an unnecessary search. If you plan to leave the group, for a short time or for the balance of the day, be certain you inform the leader.

It is in your interest to stay close to the leader and the more experienced members of the group so that you can rely on their knowledge and bird-finding skills.

Staying close applies to car caravanning, too. The rule of thumb is one car length back for every ten miles per hour of velocity. Thirty miles per hour; three car lengths behind the bumper ahead of you. Sixty miles per hour; six lengths. Don't trust yourself to keep the pace? Don't drive. Car-pool with someone else.

• Rule 5 - Come prepared.

If the trip involves driving, make sure you have enough fuel to see you through. If the instructions state "bring lunch," don't assume that you'll be able to stop at a convenience store to pick up a sandwich. Do that, and you'll likely be eating alone.

• Rule 6 - Check out your equipment before the trip.
The single greatest frustration first-time trip goers face in not inexperience, but rather the lousy or malfunctioning equipment - usually optics.

If your binoculars aren't working, ask whether a loaner is available. It you don't own binoculars, do not rush out to the nearest discount store and buy some for the trip. People who do this usually end up with instruments they soon replace. Borrow binoculars for the trip. Use your field trip experience to see what instruments experienced birders are using in order to make an educated purchase later.

• Rule 7 - Speak Softly.
Human voices put wildlife on alert. Talking may also prevent a leader from hearing songs or calls and keep you from hearing instructions. Field trips are social and conversation is part of the field trip experience. If you want to converse, do so in whispers or stand away from the group.

• Rule 8 - Keep motion to a minimum.
More than sound, birds react to motion. In close proximity to birds, don't move quickly and above all do not advance until the leader gives the word. Want to draw the ire of a group? Walk toward "the bird of the day" and scare it away.

• Rule 9 - Don't monopolize the leader.
Sure you have questions. Sure you want to get to know the leader, and you want them to come to recognize your wonderful qualities, too. One of those qualities should be deference, because everyone in the group shares your ambition. Deference extends to use of the spotting scopes, too.

When the leader trains his scope on an interesting bird, and you were first to get a glimpse last time, defer to others the next several times. No matter what your place in line, first looks through a scope are quick looks. After you get an identifying glimpse, step quickly aside for the next person. If the bird is moving, reposition the scope so the next user won't have to pan back and forth. After everyone has had their glimpse, more leisurely viewing is possible.

• Rule 10 - Do ask questions.

Leaders want to share their knowledge, and questions are the catalyst that unlocks it. Don't be intimidated by what you don't know or what you presume that others know. Chances are your question is shared by others in the group. You may not be the leader, but if you trigger the answer to a question that some other member of the group was too shy to utter, you'll be their hero. That's it. All you need to know to get the most out of your first field trip experience. If it seems like too much to remember, just remember Rule #1. At any other time, there will be someone else around to ask for assistance.

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Birdwatching.doc
BIRDWATCHING IN THAILAND
Feathered Magic from Mangroves to Mountaintops by Antony Lynam

One of the great attractions for nature tourists visiting Thailand is the diversity of environments extending across mountain peaks, lowland rainforests, mangroves, coral reefs, farmland and urban jungles. Within a day, or even a few hours travel, one can easily make the transition between these places and witness natural marvels large and small.

For wildlife enthusiasts no group maintains interest and pleasure more than birds. While special efforts are required to see in the wild charismatic species such as elephants and primates, birds are found across the entire spectrum of environments from pristine to severely degraded areas.

Part of the attraction for birds lies in their diversity. Nine hundred and seventy eight bird species have been recorded in Thailand, approximately 10% of the world's total. At the Isthmus of Kra between latitudes 11° and 13°N, a major biogeographic transition between Indochinese and Sundaic forests produces a special diversity of birds with a total of 152 species of birds reaching the northern or southern range limits of their geographic ranges.

Two-thirds of Thai birds are residents, the remainder are seasonal visitors. Locations where migrants congregate, often in large numbers, are highly accessible making Thailand a special destination for birdwatchers.

Many birds are susceptible to human disturbance because they have small geographic ranges, a result of specific habitat requirements. For example, Deignan's babbler - a non-descript forest bird is found on Doi Chiang Dao and nowhere else in the world. Gurney's pitta are only found in lowland rainforests. Fewer than 30 birds remain in the last known population in Thailand at Khao Nor Chuchi, Krabi. Efforts by local and international conservation agencies strive to increase protection efforts and reafforest areas encroached by rubber farmers, though time is running out. With approximately 20% of the birds found in Thailand being globally or regionally endangered species, this makes the country a birdwatching haven for bird enthusiasts.

IDENTIFYING BIRDS

Birds are distinguished first by their size and shape. They range from diminutive flowerpeckers, sunbirds and white-eyes, about the size of your index finger, to lanky storks and egrets that stand almost a metre tall, and Green peafowl with its spectacular 2m tail. The form of the beak offers vital clues about the bird's diet. For example a thin curved tube for sipping nectar or a sharp hook for tearing flesh. The pattern and colour of plumage can tell apart the sexes as in pheasants where males are bright and striking, and females are drab and dowdy. By far the most useful character for identification is a bird's voice. This is especially true in forests where on average 90% of birds are hidden from view. The most experienced birdwatchers in the tropics know their songs and calls.

BEST TIMES TO SEE BIRDS

The nesting season is a good time to be watching birds. During this most active time in a bird's life a variety of vocalizations and behaviours are exhibited. In Thailand, as in other tropical countries, the nesting season coincides with the period when food is in abundant supply. A bird expends much energy in courting, mating, incubating eggs, defending a nest and feeding offspring. Most birds nest during the transition between dry and wet seasons when new leaves and grass shoots sprout. This occurs from February to June. Certain birds depend on the availability of water and nest throughout the rainy season.

Migrants are best observed during their passage into or out of the country, or as they pass through on their way to other places. Most conspicuously, half a million ducks spend their winter in Thailand, feeding and resting in watery roosts from Chiang Saen to Thale Noi. Thousands of garganey and Lesser treeduck flock during January and February.

Shorebirds like sandpipers, stints and plovers migrate long-distances between nesting grounds in Eurasia and tropical Asia and wintering grounds in Australasia. They stop to feed in Thailand's mudflats and mangroves during September to May where they stock up on invertebrates and crustaceans. During October, the southward migration of hawks over peninsular Thailand is an avian spectacle. Chinese goshawks, Japanese sparrowhawks, crested honey buzzards, black bazas, and others are seen coasting on thermals in their thousands daily. Less conspicuous is the blue-winged pitta, a ground dwelling bird that arrives with the rains to nest in deciduous and bamboo forests, and escapes the hot season for the wetter forests of Malaysia and Sumatra.

WHERE TO FIND BIRDS

Given that many birds are denizens of certain times, places, habitats or seasons, the amateur naturalist can remember them by association.

PARKS, TEMPLES AND GARDENS

Some species like barn swallows, magpie robins, mynas and starlings can be found around Bangkok and environs. Lumphini Park, a heavily-used green area in the city centre supports a variety of birds with over 90 species having been recorded there. Temples near Bangkok and Ayutthaya preserve pockets of the natural landscape including birds such as black kites, parakeets and woodland birds that are characteristic of the habitats.

RICE PADDIES, MARSHES AND PONDS

Rice paddies, marshes and ponds away from built-up areas support breeding populations of Asian openbill stork and many other waterbirds.
Key sites: Suphan Buri-Ayutthaya and Beung Boraphet.

PEAT SWAMP FORESTS
Almost the last vestige of Thailand's peat swamp forest at Phru To Daeng or Chalerm Phrakiat Wildlife Sanctuary in Narathiwat supports Lesser adjutants, a kind of stork, along with several birds characteristic of Sundaic forests.

LAKES, RIVER SANDBANKS AND REEDBEDS
Lakes, river sandbanks and reedbeds preserve unique assemblages of wintering waterfowl and perching birds.
Key sites: Chiang Saen, Fang Hot Springs, and Thaton.

AGRICULTURAL LANDSCAPES
Agricultural landscapes across the country support species that tolerate human presence and include kites, rollers, bee-eaters, coucals, weavers and bulbuls.

SANDY BEACHES, MANGROVE AND TIDAL FLATS
Sandy beaches are attractive to tourists but are barren habitats for birds, while little-visited mangroves and tidal flats that are rich in nutrients and microorganisms, are favoured feeding haunts for migrant waders. Some birds like the Brown-winged kingfisher and Mangrove pitta, are entirely restricted to mangroves while Mangrove whistlers and flyeaters rarely leave the area.
Key sites: Samut Sakhon, Ban Laem in Petchburi, and Krabi.

OFFSHORE ISLANDS
Offshore islands such as Phi Phi, Libong, Surin and the Similans support fewer species than similar sized mainland habitats but some such as Nicobar and Pied Imperial pigeon are entirely restricted to these refuges.

SEASCAPES
While there are fewer seabirds in the warm Thai waters compared with those in the northern and southern hemispheres, frigate birds, skuas, boobies, and terns are among the rewards for marine birders.

FORESTS
Most resident Thai birds depend upon forests for their survival. Rainforests in the extreme south support the greatest avian diversity, while seasonally dry dipterocarp, mixed deciduous and evergreen forests in the centre and north.
Key sites: Khao Yai National Park, Kaeng Krachan National Park, Khao Soi Dao, Nam Nao National Park, Khao Nor Chuchi, Ban Nai Chong, and Hala Bala Wildlife Sanctuary.

MOUNTAINS
Sibias, minlas, and laughing thrushes are relatives of species found in the Himalayas and southern China, and can only be found in mountain forests. Following surveys of high mountain peaks in the last decade, at least 20 new species or 2% of the total have been added to the lists for Thailand.
Key sites: Doi Pha Hom Pok, Doi Chiang Dao, Doi Inthanon, Doi Ang Khang, and Doi Suthep.

By visiting these enchanting destinations, travellers can appreciate the avian wonders that Thailand offers and better understand the importance of the wild and not so wild areas that preserve them.

Contact information:
Bird Conservation Society of Thailand (BCST)*
69/12 Soi Ramindra 24, Joorakaebau, Ladprao, Bangkok 10230, Thailand
Email: bcst@box1.a-net.net.th
Tel: 66-(0)-2943-5965
Web sites:
www.bcst.org/index_ebird.html
www.thai.net/bcst
* The Bird Conservation Society of Thailand (BCST) is a BirdLife Partner

Oriental Bird Club (OBC)
c/o Uthai Treesucon, 723/1 Mu 2 Soi Ram Intra, Joorakhaebua, Bangkok 10230.
E-mail:
utree@loxinfo.co.th
mail@orientalbirdclub.org
Web site: www.orientalbirdclub.org

Wildlife Conservation Society - Thailand Programme
P.O. Box 170, Laksi, Bangkok 10210
Tel: +662-503 4478, +662-503 4479
Fax: +662-503 4096
Email: thailand@wcs.org

Reference information:
Field guide
Robson, C. 2002.
A field guide to the birds of Thailand.
Asia Books, Bangkok. 272pp.

TAT PUBLICATIONS ON NATURE TOURISM
For more information on birdwatching in Thailand, please refer to the following nature tourism guide books in the "National Park" series published by the Tourism Authority of Thailand as part of the Tourism and Employment Creation Plan implemented under the Social Investment Project.

KHAO YAI: DONG PHAYA YEN FOREST RANGE
ISBN 974-8252-70-1

KAENG KRACHAN:
Amazing Forest of Phetchburi River
ISBN 974-8252-72-8

KHAO SOK
Fascinating Limestone Mountains Amid The Verdant Forest of Surat Thani, Thailand
ISBN 974-679-099-4

DOI INTHANON - DOI SUTHEP
The Himalayan Springs of Thailand
SBN 974-8252-67-1

PHU LUANG
The Kingdom of Plants
ISBN 974-8252-73-6

BIRDWATCHING TIPS

Consult field guides, checklists, and maps prior to arriving at the birdwatching destination.

Dress in colours that blend in with the surroundings.

Bring appropriate equipment such as telescope, bird guide, and a notebook.

Plan to arrive at the destination at sunrise when birds are first out in search for food and are most active.

Walk slowly stopping at intervals to listen for calling birds.

Look for the birds in thickets, on the branches of trees, and on the ground.

Avoid talking, smoking, or walking on dry leaves, all of which will scare birds away.

CONSERVING BIRD DIVERSITY

Across the world, humans coexist with birds but human activities often affect the survival prospects for birds. Forty-eight species of birds found in Thailand (5% of the total) are globally threatened by the loss or disturbance of their habitats, food resources, and breeding areas, and by other human actions, and so require special conservation attention. A further 97 species (10%) are potentially threatened if current trends persist.

In Thailand, 101 species (10% of the total) are hunted as pests, for food or for the pet trade and are directly threatened by humans. The list of hunted species includes waterbirds, birds of prey, pheasants, parakeets, pigeons, hornbills, pittas weavers, bulbuls, and other forest birds. Worldwide the trade in birds includes 2,600 species and several million birds each year. Ten percent of threatened birds worldwide are affected by the bird trade.

There are a number of ways in which the numbers and distribution of threatened birds are being restored. Habitat conservation programmes are an important mechanism. Feeding habitats for seasonal migrants are being preserved by incorporating mangroves and coastal tidal areas in marine protected areas. Lowland forests that support Gurney's pitta and other diversity are being protected and a reafforestation programme planned. Preventing encroachment around the edges of parks maintains the integrity of forest blocks used by the majority of native birds, including migrant raptors and songbirds.

In most cases, preserving and protecting natural habitats can bring back even highly endangered populations of rare birds. These measures are relatively cost effective to implement. As an example, a 3-year Khao Yai Conservation Project preserved over 2,000 sq km of wildlife habitat, discouraged poaching, and provided employment alternatives for local forest resource users, at an annual cost of 7 million baht (US$171,000).

For critically endangered species, whose populations are extremely small, and whose survival in the wild is uncertain due to factors that simply cannot be controlled, other more costly measures such as

captive breeding, are being considered. Captive breeding is risky because birds need to be recovered from the wild to establish breeding populations, and injury is possible. Some species do not breed well in captivity because their natural courting and nesting behaviours are no longer possible. Strict controls on who is allowed to breed endangered species, registration of individuals, and enforcement of laws so that commercial sale is not possible, need to be adopted. Without these controls, captive breeding programmes cannot succeed.

HOW YOU CAN HELP IN THE CONSERVATION OF BIRDS

Visitors to Thailand can assist efforts to preserve and maintain the diversity of birds and their habitats simply by visiting national parks and other wilderness areas. Bird enthusiasts can report the species they observe to authorities. Checklists are now available at many popular national parks. Tourists can report evidence of suspicious activity that might lead to the arrest of unscrupulous individuals trapping or hunting birds and can also participate as volunteers in habitat conservation programmes. In these ways, tourists can help reduce the threats to birds, and at the same time enjoy Thailand's birdwatching paradise.

Contact information:

TO REPORT BIRD SPECIES OBSERVED
TO REPORT BIRD SPECIES OBSERVED
Please contact the Park Visitor Centre of the National Park
or
Bird Conservation Society of Thailand (BCST)*
69/12 Soi Ramindra 24, Joorakaebau, Ladprao, Bangkok 10230, Thailand
Email: bcst@box1.a-net.net.th
Tel: 66-(0)-2943-5965
Web sites:
www.bcst.org/index_ebird.html
www.thai.net/bcst
* The Bird Conservation Society of Thailand (BCST) is a BirdLife Partner

TO REPORT EVIDENCE OF SUSPICIOUS ACTIVITY
Please contact
Willdife Protection and Suppression Office
Department of National Parks, Wildlife, and Plant Conservation
61 Paholyothin Road, Chatuchak, Bangkok 10900
Tel: 66-(0)-2579-5266

HABITAT CONSERVATION VOLUNTEER PROGRAMMES
Please contact
Wildlife Conservation Society - Thailand Programme
P.O. Box 170, Laksi, Bangkok 10210
Tel: +662-503 4478, +662-503 4479
Fax: +662-503 4096
Email: thailand@wcs.org
FAMILIES OF BIRDS IN THAILAND UNDER THREAT
The following bird species are under threat because there is a high demand for them and they are hunted for the local, regional and global bird trade. To help preserve the species, please refrain from purchasing any of the following birds as pets, and if you happen to witness any of the following birds being sold or traded, or note any suspicious activities involving them, please contact:

The Willdife Protection and Suppression Office
Department of National Parks, Wildlife, and Plant Conservation
61 Paholyothin Road, Chatuchak, Bangkok 10900
Tel: 66-(0)-2579-5266

Phasianidae (wood partridges and pheasants) - 4 species

Anatidae (White-winged duck) - 1 species

Picidae (woodpeckers and barbets) - 3 species

Bucerotidae (hornbills) - 7 species

Upupidae (Common hoopoe) - 1 species

Cuculidae (Coral-billed ground cuckoo) - 1 species

Psittacidae (parrots and parakeets) - 4 species

Columbidae (pigeons) - 12 species

Accipitridae (birds of prey) - 9 species

Threskiornithidae (White-shouldered ibis) - 1 species

Ciconiidae (Lesser adjutant) - 1 species

Pittidae (pittas) - 3 species

Irenidae (Asian fairy bluebird and leafbirds) - 6 species

Corvidae (jays, crows, magpies, orioles and minivets) - 14 species

Muscicapidae (thrushes, robins, and sharmas) - 3 species

Sturnidae (starlings and mynas) - 3 species

Paridae (Yellow-cheeked tit) - 1 species

Pycnonotidae (bulbuls) - 7 species

Zosteropidae (Japanese white-eye) - 1 species

Sylvidae (laughing thrushes, mesias, minlas and sibias) - 8 species

Nectariniidae (Scarlet-backed flowerpecker) - 1 species

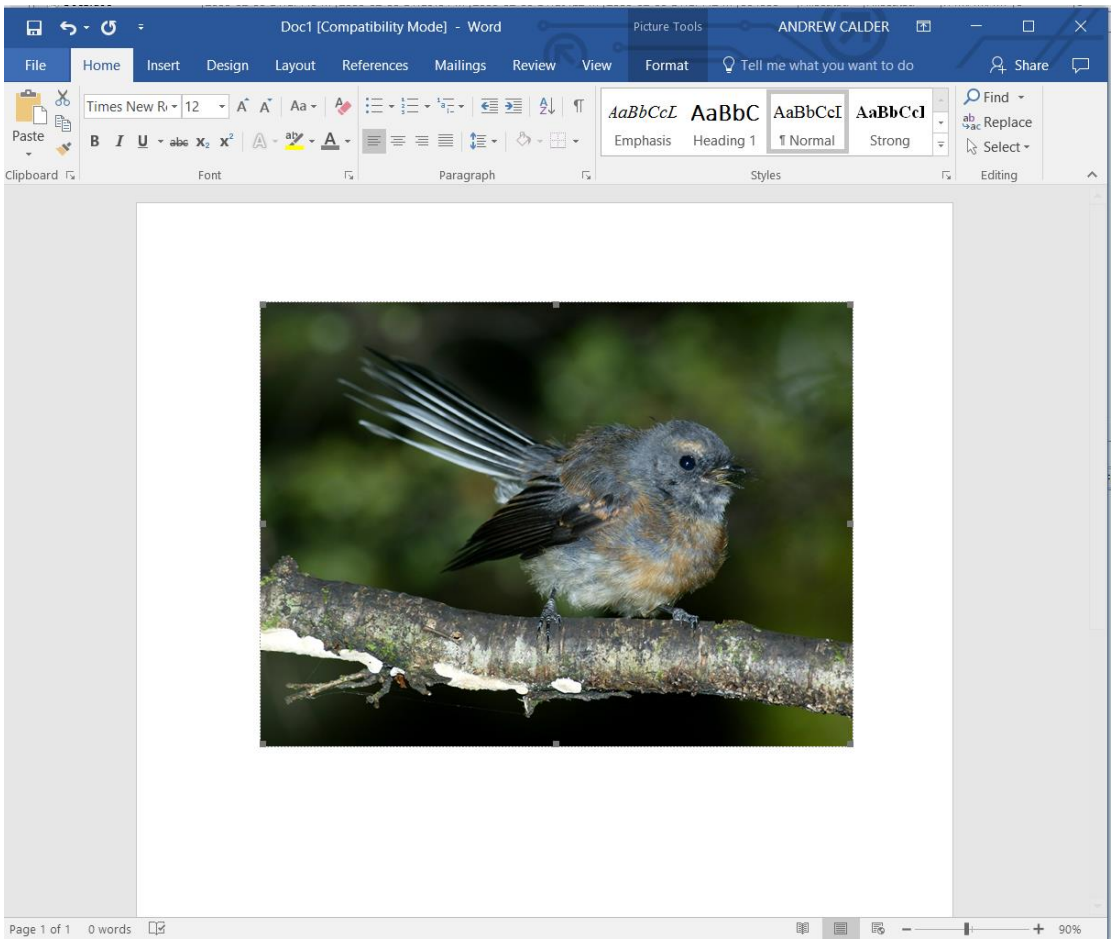
Passeridae (weavers and munias) - 7 species

Fringillidae (grosbeaks and buntings) - 3 species

About The Author
ANTONY LYNAM
Antony Lynam (Ph.D.), Wildlife Conservation Society (WCS)- Thailand Programme Director and conservation scientist, works with the Thailand Department of National Parks, Wildlife and Plants to develop programmes for the conservation of the country's endangered species, park resources management, and the design and conduct of training curriculum for park rangers.

An Australian citizen, he has authored a number of technical papers and popular articles concerning conservation issues in Australia, North America, and Thailand, and was a contributor to the seminal volume on habitat fragmentation "Tropical Forest Remnants: Ecology, Conservation and Management". He writes frequently on natural history for magazines, journals and newspapers including Wildlife Conservation, The Nation, The Bangkok Post, and The Natural History Bulletin of The Siam Society.

Doc1.doc



nestboxtips.txt

Tips for Nest Boxes this spring/summer

If you have old boxes in your garden, clean out any of last years nesting material or any old bits of food that may have been stored in there.

If you are putting up new nest boxes make sure that they are out of the reach of cats and Squirrels.

Check that the box isn't in full sun otherwise young birds may literally bake in the heat.

Experiment with different kinds of bird boxes – the open-fronted "Robin" boxes may even attract Spotted Flycatchers.

Make sure any boxes are at least 15mm in thickness.

Face boxes away from prevailing winds.

Don’t put nest boxes to close together in a small area as this will only lead to territorial fights.

Always make sure that there is enough food and fresh water made available close by.

Do not but bird boxes with perches attached – the birds do not need them and it may only invite predators.

Never buy a bird table with a nest box built in, as nesting birds will only come into conflict with feeding ones.

Stuf.doc

Dear Sir

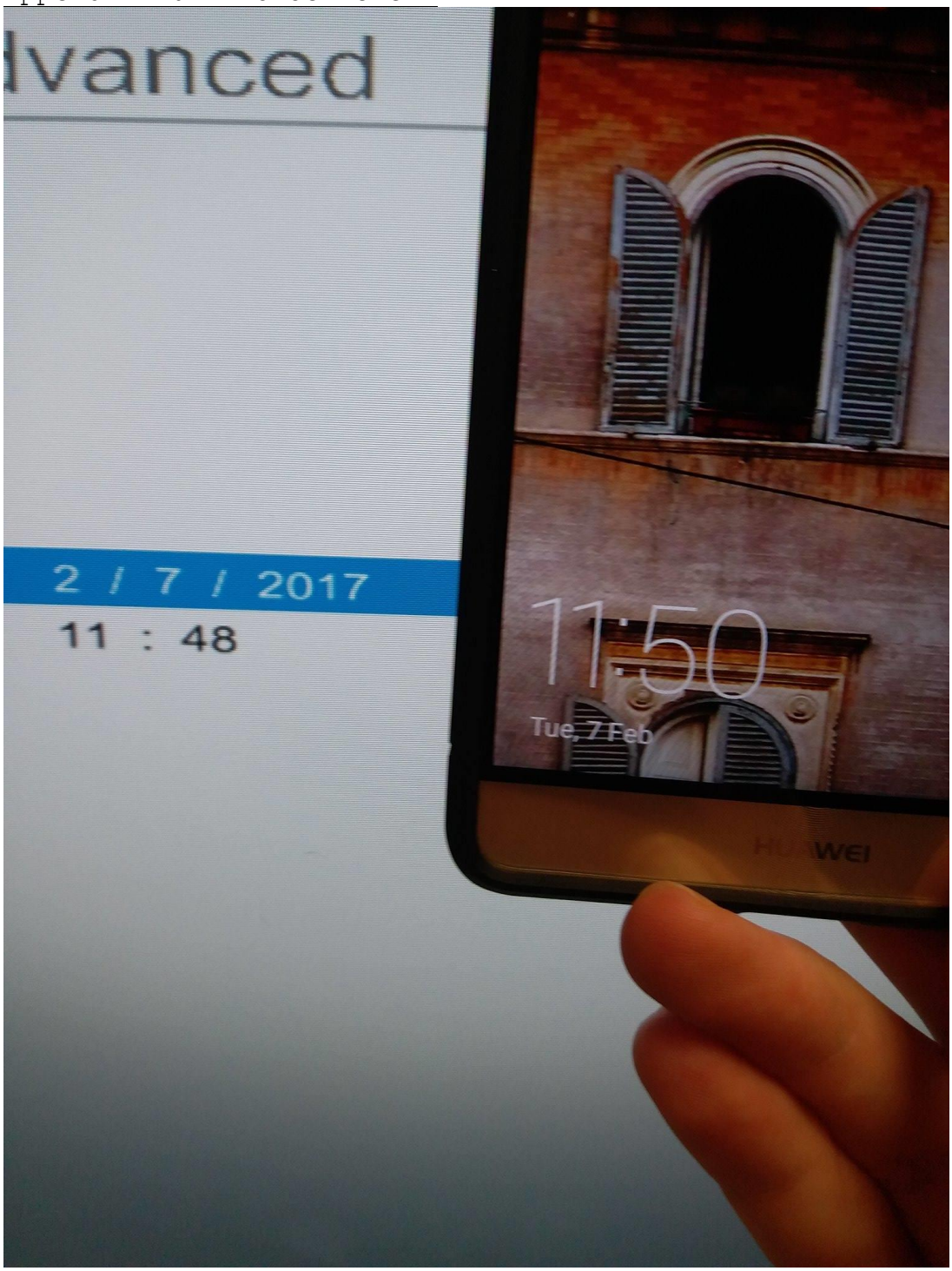
Further to our conversation everything we have discussed has been done

Yours faithfully

John Doe

Appendix 9 – "birds.zip Screensaver"

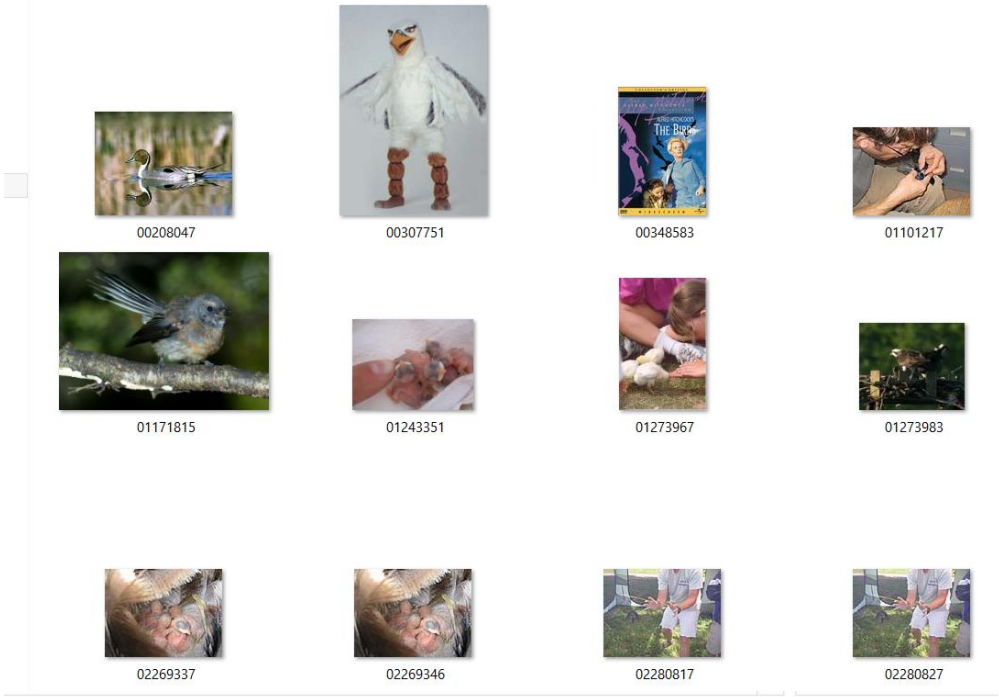
Appendix 10 – "Clock Skew"

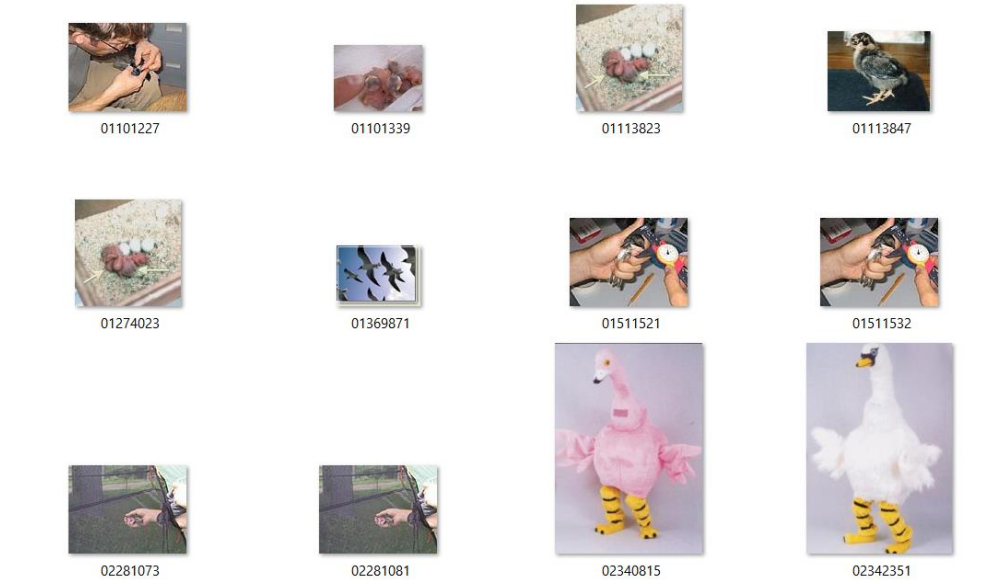


Appendix 11- "Partitions"

Name	ID	Starting Sector	Length in Sectors	Description	Flags
vol1 (Unallocated: 0-62)	1	0	63	Unallocated	Unallocated
vol2 (NTFS / exFAT (0x07): 63-6136829)	2	63	6136767	NTFS / exFAT (0x...	Allocated
vol3 (Unallocated: 6136830-11255327)	3	6136830	5118498	Unallocated	Unallocated

Appendix 12 - "All Images of MRB".






02437871


02790611

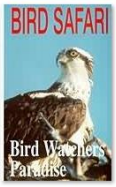

02790656


02790683


02792407


02792663


02903551



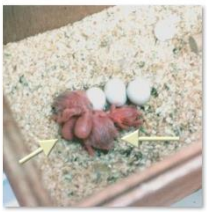
02942159


02974511

03018919


03074343


03112503


02790743


02791391


02791503


02792151


02962639


02963839


02966601


02972615


03180791


03180943


03181927


03184607


03185759


03186407


03188831


03538975


05069311


05475951


05698559


06137366


06139198


06140582


06141078


06141686


06143534


06144262


06144726


06145254


03593991


03875487


04051481


04056673


06137718


06138054


06138454


06138918


06142126


06142254


06142470


06143094


06145878


06145998


06146382


06146806

E^%@%birds@%birdpics@%WhoopingCranes

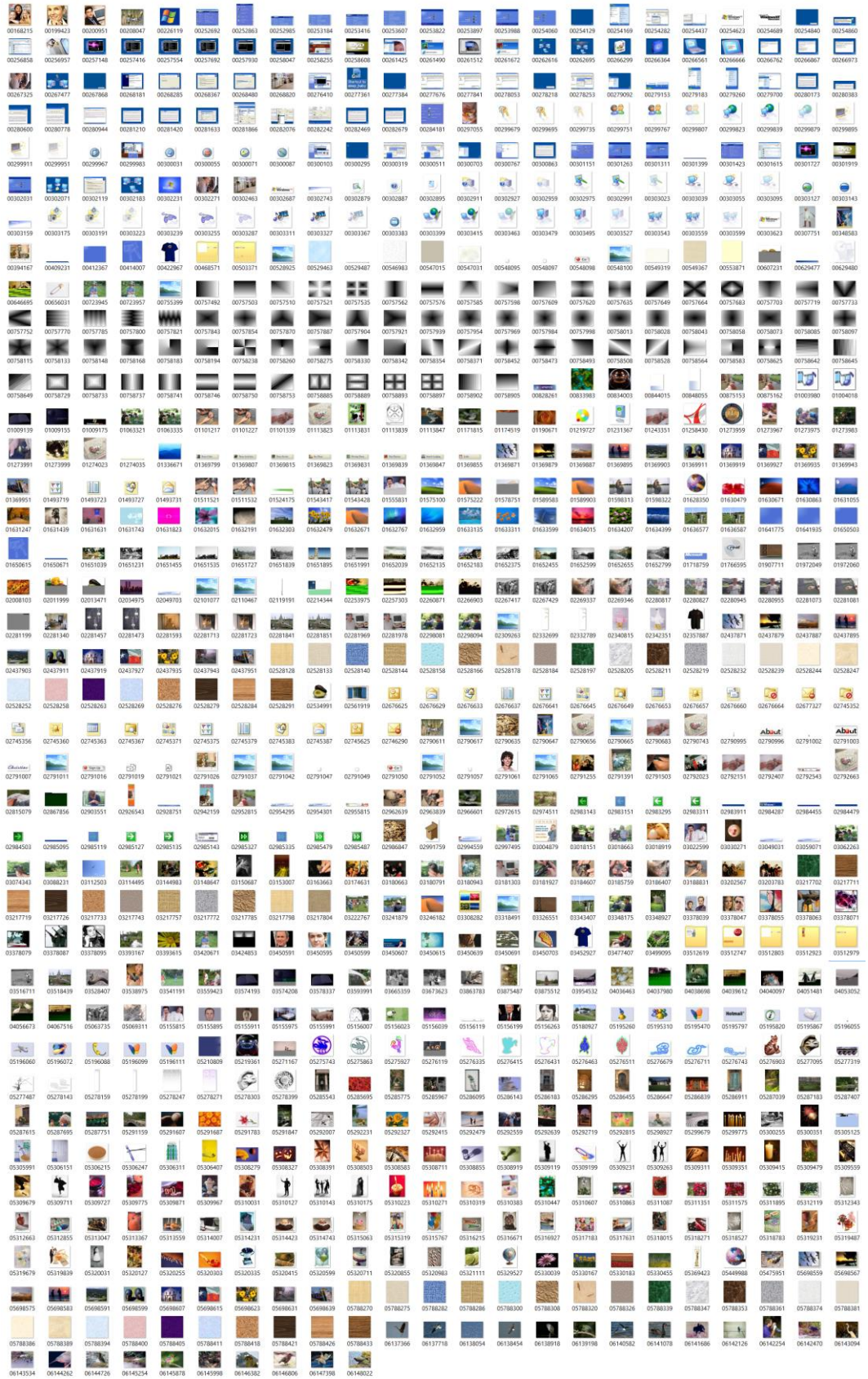
E^%@%birds@%birdpics@%WhiteThroatedSparrowInTree

E^%@%birds@%birdpics@%WhiteFrontedParrot

E^%@%birds@%birdpics@%WhiteFacedHeronFlying

E^%@%birds@%birdpics@%yellow-wag-cover-nb

Appendix 13 – Physical Search Images



Appendix 14 – “Virus Scan”

```
/mnt/suspectDrive/Program Files/Network Associates/VirusScan/readme.txt: Eicar-Test-Signature FOUND
/mnt/suspectDrive/Program Files/Network Associates/VirusScan/RepairCache/vse800.msi: Eicar-Test-Signature FOUND
/mnt/suspectDrive/Program Files/Real/RealPlayer/realplay.exe: Win.Trojan.Tufik-100 FOUND
/mnt/suspectDrive/WINDOWS/Installer/e3bb0.msi: Eicar-Test-Signature FOUND

----------- SCAN SUMMARY -----------
Known viruses: 6172970
Engine version: 0.99.2
Scanned directories: 1431
Scanned files: 15666
Infected files: 4
Data scanned: 2645.76 MB
Data read: 2926.50 MB (ratio 0.90:1)
Time: 247.131 sec (4 m 7 s)
```

Realplayer is a false positive as cross checking with other anti-virus shows:

ClamAV	Win.Trojan.Tufik-100	20170413
K7AntiVirus	Trojan (004906d41)	20170413
K7GW	Trojan (004906d41)	20170413
McAfee	Artemis!8B0334F36476	20170412
McAfee-GW-Edition	Artemis	20170413
VBA32	Worm.Viking	20170413
Ad-Aware	✓	20170413
AegisLab	✓	20170413
AhnLab-V3	✓	20170413
Alibaba	–	20170413
ALYac	✓	20170413
Antiy-AVL	✓	20170413
Arcabit	✓	20170413
Avast	✓	20170413
AVG	✓	20170413
Avira (no cloud)	✓	20170413
AVware	✓	20170410
Baidu	✓	20170411
BitDefender	✓	20170413
Bkav	✓	20170413
CAT-QuickHeal	✓	20170412
CMC	✓	20170413
Comodo	✓	20170413
CrowdStrike Falcon (ML)	✓	20170130
Cyren	✓	20170413
DrWeb	✓	20170413
Emsisoft	✓	20170413
Endgame	✓	20170413
ESET-NOD32	✓	20170413
F-Prot	✓	20170413
F-Secure	✓	20170413
Fortinet	✓	20170413
GData	✓	20170413
Ikarus	✓	20170413
Invincea	✓	20170413
Jiangmin	✓	20170413
Kaspersky	✓	20170413
Kingsoft	✓	20170413
Malwarebytes	✓	20170413
Microsoft	✓	20170413
eScan	✓	20170413
NANO-Antivirus	✓	20170413
nProtect	✓	20170413
Palo Alto Networks (Known Signatures)	✓	20170413
Panda	✓	20170413
Qihoo-360	✓	20170413
Rising	✓	None
SentinelOne (Static ML)	✓	20170330
Sophos	✓	20170413
SUPERAntiSpyware	✓	20170413
Symantec	✓	20170412
Symantec Mobile Insight	–	20170413
Tencent	✓	20170413
TheHacker	✓	20170412
TrendMicro	✓	20170413
Trustlook	–	20170413
VIPRE	✓	20170413
ViRobot	✓	20170413

Appendix 15 – "MRB Access From Internet Explorer"

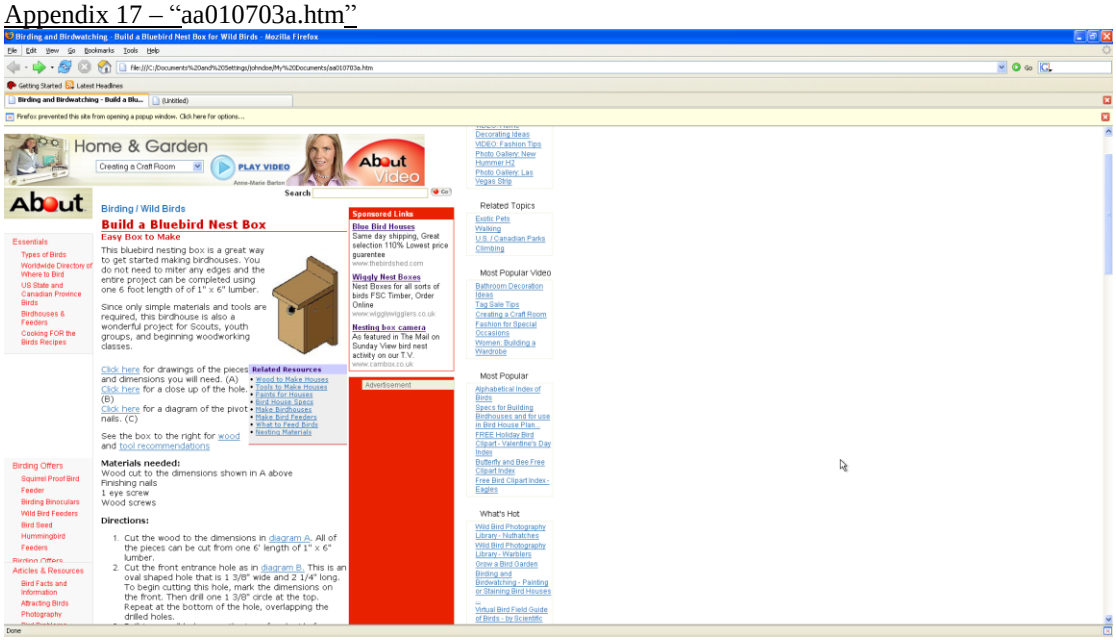
Name	URL Address	When	Browser	user
index.dat	http://www.linorg.usp.br/mozilla//firefox/releases/1.0/win32/en-GB/Firefox%20Setup%201.0.exe	2005-01-24 16:19:35 GMT	Internet Explorer	johndoe
index.dat	file/Documents%20and%20Settings/johndoe/My%20Documents/My%20Pictures/tn_duck_3.jpg	2005-02-02 14:18:13 GMT	Internet Explorer	johndoe
index.dat	file/Documents%20and%20Settings/johndoe/My%20Documents/My%20Pictures/snow_geese.jpg	2005-02-02 14:18:53 GMT	Internet Explorer	johndoe
index.dat	file/Documents%20and%20Settings/johndoe/My%20Documents/My%20Pictures/7107298.jpg	2005-02-02 14:20:33 GMT	Internet Explorer	johndoe
index.dat	file/Documents%20and%20Settings/johndoe/My%20Documents/My%20Pictures/wbpremium_s.jpg	2005-02-02 14:28:19 GMT	Internet Explorer	johndoe
index.dat	file/Documents%20and%20Settings/johndoe/My%20Documents/nestboxtips.txt	2005-02-02 14:29:30 GMT	Internet Explorer	johndoe
index.dat	file/Documents%20and%20Settings/johndoe/My%20Documents/My%20Pictures/40m.jpg	2005-02-02 14:43:36 GMT	Internet Explorer	johndoe
index.dat	file/birds/audio/aggressive_song.wav	2005-02-03 12:22:51 GMT	Internet Explorer	johndoe
index.dat	file/EvanstonWoodpecker.jpg	2005-02-03 14:14:59 GMT	Internet Explorer	johndoe
index.dat	file/Documents%20and%20Settings/All%20Users/Documents/My%20Music/Sample%20Music/Doc1.doc	2005-02-03 14:17:48 GMT	Internet Explorer	johndoe
index.dat	file/birds/Killdeer.jpg	2005-02-03 14:49:29 GMT	Internet Explorer	johndoe
index.dat	file/Documents%20and%20Settings/johndoe/My%20Documents/My%20Pictures/babyscot_vyoung.jpg	2005-02-03 15:00:19 GMT	Internet Explorer	johndoe
index.dat	file/Documents%20and%20Settings/johndoe/My%20Documents/My%20Pictures/babyscot_2weeks1.jpg	2005-02-03 15:00:27 GMT	Internet Explorer	johndoe
index.dat	file/Documents%20and%20Settings/johndoe/My%20Documents/My%20Pictures/177.jpg	2005-02-03 15:01:38 GMT	Internet Explorer	johndoe
index.dat	file/Documents%20and%20Settings/johndoe/My%20Documents/ostbk2b2.htm	2005-02-03 15:02:45 GMT	Internet Explorer	johndoe
index.dat	file/Documents%20and%20Settings/johndoe/Desktop/birdtrans2.jpg	2005-02-03 15:04:48 GMT	Internet Explorer	johndoe
index.dat	file/Documents%20and%20Settings/johndoe/My%20Documents/My%20Pictures/chicks2.jpg	2005-02-03 15:05:03 GMT	Internet Explorer	johndoe
index.dat	file/Documents%20and%20Settings/johndoe/My%20Documents/newbies2.jpg	2005-02-03 15:05:44 GMT	Internet Explorer	johndoe
index.dat	file/Documents%20and%20Settings/bob/My%20Documents/My%20Music/ready2fledge.jpg	2005-02-03 15:06:42 GMT	Internet Explorer	johndoe
index.dat	file/birdwatching.doc	2005-02-03 15:49:39 GMT	Internet Explorer	johndoe
index.dat	file/birds/non%20images/BookList.doc	2005-02-03 15:51:54 GMT	Internet Explorer	johndoe
index.dat	file/birds/non%20images/BirdingGuide.pdf	2005-02-03 15:52:01 GMT	Internet Explorer	johndoe
index.dat	file/Documents%20and%20Settings/johndoe/My%20Documents/birds.zip	2005-02-09 11:28:00 GMT	Internet Explorer	johndoe
index.dat	file/Documents%20and%20Settings/All%20Users/Documents/My%20Music/Sample%20Music/Doc1.doc	2005-02-09 11:28:01 GMT	Internet Explorer	johndoe
index.dat	file/Documents%20and%20Settings/johndoe/My%20Documents/My%20Pictures/7107298.jpg	2005-02-09 11:28:01 GMT	Internet Explorer	johndoe
index.dat	file/Documents%20and%20Settings/johndoe/My%20Documents/kakapo.ram	2005-02-09 11:28:01 GMT	Internet Explorer	johndoe
index.dat	file/Documents%20and%20Settings/johndoe/My%20Documents/My%20Pictures/40m.jpg	2005-02-09 11:28:01 GMT	Internet Explorer	johndoe
index.dat	file/Documents%20and%20Settings/johndoe/My%20Documents/My%20Pictures/177.jpg	2005-02-09 11:28:01 GMT	Internet Explorer	johndoe
index.dat	file/Documents%20and%20Settings/johndoe/My%20Documents/nestboxtips.txt	2005-02-09 11:28:01 GMT	Internet Explorer	johndoe
index.dat	file/Documents%20and%20Settings/johndoe/My%20Documents/aa010703a.htm	2005-02-09 11:28:01 GMT	Internet Explorer	johndoe
index.dat	file/Documents%20and%20Settings/johndoe/My%20Documents/My%20Pictures/tn_duck_3.jpg	2005-02-09 11:28:01 GMT	Internet Explorer	johndoe
index.dat	file/Documents%20and%20Settings/johndoe/Desktop/birdtrans2.jpg	2005-02-09 11:28:01 GMT	Internet Explorer	johndoe
index.dat	file/EvanstonWoodpecker.jpg	2005-02-09 11:28:01 GMT	Internet Explorer	johndoe
index.dat	file/Documents%20and%20Settings/johndoe/My%20Documents/My%20Pictures/babyscot_vyoung.jpg	2005-02-09 11:28:01 GMT	Internet Explorer	johndoe
index.dat	file/Documents%20and%20Settings/johndoe/My%20Documents/My%20Pictures/babyscot_2weeks1.jpg	2005-02-09 11:28:01 GMT	Internet Explorer	johndoe
index.dat	file/Documents%20and%20Settings/johndoe/My%20Documents/newbies2.jpg	2005-02-09 11:28:01 GMT	Internet Explorer	johndoe
index.dat	file/Documents%20and%20Settings/johndoe/My%20Documents/My%20Pictures/snow_geese.jpg	2005-02-09 11:28:01 GMT	Internet Explorer	johndoe
index.dat	file/birds/non%20images/BookList.doc	2005-02-09 11:28:01 GMT	Internet Explorer	johndoe
index.dat	file/Documents%20and%20Settings/All%20Users/Documents/My%20Music/Sample%20Music/Doc1.doc	2005-02-09 11:28:01 GMT	Internet Explorer	johndoe
index.dat	file/Documents%20and%20Settings/johndoe/My%20Documents/My%20Pictures/7107298.jpg	2005-02-09 11:28:01 GMT	Internet Explorer	johndoe
index.dat	file/Documents%20and%20Settings/johndoe/My%20Documents/kakapo.ram	2005-02-09 11:28:01 GMT	Internet Explorer	johndoe
index.dat	file/Documents%20and%20Settings/johndoe/My%20Documents/My%20Pictures/40m.jpg	2005-02-09 11:28:01 GMT	Internet Explorer	johndoe
index.dat	file/Documents%20and%20Settings/johndoe/My%20Documents/My%20Pictures/177.jpg	2005-02-09 11:28:01 GMT	Internet Explorer	johndoe
index.dat	file/birdwatching.doc	2005-02-09 11:28:01 GMT	Internet Explorer	johndoe
index.dat	file/Documents%20and%20Settings/johndoe/My%20Documents/nestboxtips.txt	2005-02-09 11:28:01 GMT	Internet Explorer	johndoe
index.dat	file/Documents%20and%20Settings/johndoe/My%20Documents/aa010703a.htm	2005-02-09 11:28:01 GMT	Internet Explorer	johndoe
index.dat	file/Documents%20and%20Settings/johndoe/My%20Documents/My%20Pictures/tn_duck_3.jpg	2005-02-09 11:28:01 GMT	Internet Explorer	johndoe
index.dat	file/birds/audio/aggressive_song.wav	2005-02-09 11:28:01 GMT	Internet Explorer	johndoe
index.dat	file/Documents%20and%20Settings/johndoe/Desktop/birdtrans2.jpg	2005-02-09 11:28:01 GMT	Internet Explorer	johndoe
index.dat	file/EvanstonWoodpecker.jpg	2005-02-09 11:28:01 GMT	Internet Explorer	johndoe
index.dat	file/Documents%20and%20Settings/johndoe/My%20Documents/My%20Pictures/babyscot_vyoung.jpg	2005-02-09 11:28:01 GMT	Internet Explorer	johndoe
index.dat	file/Documents%20and%20Settings/johndoe/My%20Documents/My%20Pictures/babyscot_2weeks1.jpg	2005-02-09 11:28:01 GMT	Internet Explorer	johndoe
index.dat	file/Documents%20and%20Settings/johndoe/My%20Documents/newbies2.jpg	2005-02-09 11:28:01 GMT	Internet Explorer	johndoe
index.dat	file/Documents%20and%20Settings/johndoe/My%20Documents/My%20Pictures/snow_geese.jpg	2005-02-09 11:28:01 GMT	Internet Explorer	johndoe
index.dat	file/birds/non%20images/BookList.doc	2005-02-09 11:28:01 GMT	Internet Explorer	johndoe
index.dat	file/Documents%20and%20Settings/johndoe/My%20Documents/stuf.doc	2005-02-09 16:57:49 GMT	Internet Explorer	

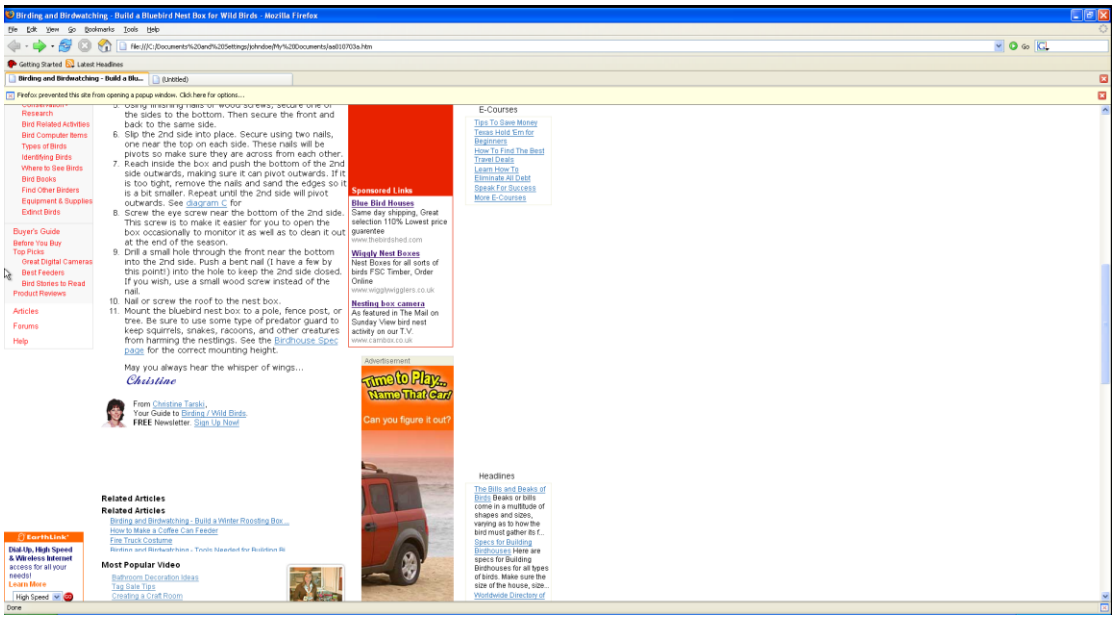
Appendix 16 – "Firefox History"

Name	URL Address	First Visit	Last Visit	Deleted	Vists
	http://www.google.co.uk/cxfer?c=PREF%3D:TM%3D1106584100:S%3DmHsHVdKIdLZ9yvE_&prev=/firefox%3Fclient%3Dfirefox-a%26rls%	24/01/2005 16:28	24/01/2005 16:28	FALSE	1
Mozilla Firefox Start Page	http://www.google.co.uk/firefox?client=firefox-a&rls=org.mozilla:en-GB:official	24/01/2005 16:28	02/02/2005 14:10	TRUE	2
	http://start.mozilla.org/firefox?client=firefox-a&rls=org.mozilla:en-GB:official	24/01/2005 16:28	03/02/2005 12:21	TRUE	3
	http://www.google.com/firefox?client=firefox-a&rls=org.mozilla:en-GB:official	24/01/2005 16:28	03/02/2005 12:21	TRUE	3
Mozilla Firefox Start Page	http://www.google.co.uk/firefox?client=firefox-a&rls=org.mozilla:en-GB:official	24/01/2005 16:28	09/02/2005 11:26	FALSE	5
	http://www.google.com/firefox?client=firefox-a&rls=org.mozilla:en-GB:official	24/01/2005 16:28	09/02/2005 11:26	FALSE	5
	http://www.google.com/firefox?client=firefox-a&rls=org.mozilla:en-GB:official	24/01/2005 16:28	02/02/2005 14:10	FALSE	2
	http://start.mozilla.org/firefox?client=firefox-a&rls=org.mozilla:en-GB:official	24/01/2005 16:28	09/02/2005 11:26	FALSE	5
About Mozilla	http://www.mozilla.org/about/	24/01/2005 16:28	24/01/2005 16:28	FALSE	1
Mozilla Products	http://www.mozilla.org/products/	24/01/2005 16:28	24/01/2005 16:28	FALSE	1
Thunderbird - Reclaim Your Inbox	http://www.mozilla.org/products/thunderbird/	24/01/2005 16:28	24/01/2005 16:28	FALSE	1
	http://download.mozilla.org/?product=thunderbird&os=win&lang=en-US	24/01/2005 16:28	24/01/2005 16:28	FALSE	1
	ftp://ftp.scarlet.be/pub/mozilla.org/thunderbird/releases/1.0/win32/en-US/Thunderbird%20Setup%201.0.exe	24/01/2005 16:28	24/01/2005 16:28	FALSE	1
	http://r.office.microsoft.com/r/rlidOfficeUpdate?clid=1033	25/01/2005 11:15	25/01/2005 11:15	FALSE	1
	http://office.microsoft.com/officeupdate	25/01/2005 11:15	25/01/2005 11:15	FALSE	1
Microsoft Office Downloads Home Page	http://office.microsoft.com/en-gb/officeupdate/default.aspx	25/01/2005 11:15	25/01/2005 11:15	FALSE	1
	http://office.microsoft.com/officeupdate/	25/01/2005 11:15	25/01/2005 11:15	FALSE	1
Microsoft Office Online: Internet Explorer version 5.0 or later is required	http://office.microsoft.com/en-gb/FX010532551033.aspx	25/01/2005 11:15	25/01/2005 11:15	FALSE	1
	http://office.microsoft.com/officeupdate/maincatalog.aspx?lc=en-gb	25/01/2005 11:15	25/01/2005 11:15	FALSE	1
	http://office.microsoft.com/search/redir.aspx?AssetID=ES790020331033&Origin=HH010704921033&CTT=5	25/01/2005 11:15	25/01/2005 11:15	FALSE	1
Microsoft Office Downloads: Office Download Catalog	http://office.microsoft.com/en-gb/officeupdate/CD010200271033.aspx	25/01/2005 11:15	25/01/2005 11:15	FALSE	1
	http://office.microsoft.com/search/redir.aspx?AssetID=CD010200271033&CTT=5&Origin=HA010704291033	25/01/2005 11:15	25/01/2005 11:15	FALSE	1
Google Search: birds	http://www.google.co.uk/search?client=firefox-a&rls=org.mozilla%3Aen-GB%3Aofficial_s&hl=en&q=birds&meta=&btnG=Google+Search	02/02/2005 14:11	02/02/2005 14:11	FALSE	1
The Life of Birds	http://www.pbs.org/lifeofbirds/	02/02/2005 14:11	02/02/2005 15:11	FALSE	2
The Life of Birds | Songs	http://www.pbs.org/lifeofbirds/songs/index.html	02/02/2005 14:12	02/02/2005 15:11	FALSE	2
	http://www.googleadservices.com/pagead/adclick?adurl=http://www.amazon.co.uk/exec/obidos/external-search%3Ftag%3Droscosolu	02/02/2005 14:14	02/02/2005 14:14	FALSE	1
Amazon.co.uk: Search Results Books: birds	http://www.amazon.co.uk/exec/obidos/external-search/026-5665785-2744400?tag=roscosolutions&keyword=birds&mode=books-uk	02/02/2005 14:14	02/02/2005 14:14	FALSE	1
	http://www.google.co.uk/pagead/iclk?adurl=http://www.amazon.co.uk/exec/obidos/external-search%3Ftag%3Droscosolutions%26keyw	02/02/2005 14:14	02/02/2005 14:14	FALSE	1
	http://www.amazon.co.uk/exec/obidos/external-search?tag=roscosolutions&keyword=birds&mode=books-uk	02/02/2005 14:14	02/02/2005 14:14	FALSE	1
Amazon.co.uk: Books: Garden Birds (Collins Gem S.)	http://www.amazon.co.uk/exec/obidos/ASIN/0007176147/qid=1107353690/sr=2-1/ref=sr_2_11_1/026-5665785-2744400	02/02/2005 14:14	02/02/2005 14:14	FALSE	1
Amazon.co.uk: Books: The Secret Lives of Garden Birds	http://www.amazon.co.uk/exec/obidos/ASIN/0713666161/qid=1107353690/sr=2-3/ref=sr_2_11_3/026-5665785-2744400	02/02/2005 14:15	02/02/2005 14:15	FALSE	1
Google Search: bird wallpaper	http://www.google.co.uk/search?q=bird+wallpaper&sourceid=mozilla-search&start=0&start=0&ie=utf-8&oe=utf-8&client=firefox-a&rls	02/02/2005 14:15	02/02/2005 14:15	FALSE	1
Free Bird Wallpaper - Bald Eagle Albatross Owl Falcon 1024x768	http://www.naturewallpaper.net/birds_L.html	02/02/2005 14:15	02/02/2005 14:15	FALSE	1
	http://as.casalemedia.com/s?s=53524&u=http%3A//www.naturewallpaper.net/birds_L.html&f=2&id=5780266264.517584	02/02/2005 14:15	02/02/2005 14:15	FALSE	1
3-Home	http://isg10.casalemedia.com/V2/40842/43608/	02/02/2005 14:15	02/02/2005 14:15	FALSE	1
	http://pagead2.googlesyndication.com/pagead/ads?client=ca-pub-0241683974610684&dt=1107353756202&lmt=1107353751&forma	02/02/2005 14:15	02/02/2005 14:15	FALSE	1
	http://asg36.casalemedia.com/s?s=53524&u=http%3A//www.naturewallpaper.net/birds_L.html&f=2&id=5780266264.517584	02/02/2005 14:15	02/02/2005 14:15	FALSE	1
	http://isg10.casalemedia.com/V2/40842/43608	02/02/2005 14:15	02/02/2005 14:15	FALSE	1
bald_eagle3.jpg	http://www.naturewallpaper.net/birdsLpages/image4.html	02/02/2005 14:16	02/02/2005 14:16	FALSE	1
Winner !!!!	http://media.fastclick.net/w/get.media?t=n&sid=11194&m=1&f=b&v=1.4&c=1495&r=http%3A//www.naturewallpaper.net/birds_L.html	02/02/2005 14:16	02/02/2005 14:16	FALSE	1
	http://pagead2.googlesyndication.com/pagead/ads?client=ca-pub-0241683974610684&dt=1107353782360&lmt=1107353781&forma	02/02/2005 14:16	02/02/2005 14:16	FALSE	1
Winner !!!!	http://media.fastclick.net/w/get.media?t=n&sid=11194&m=1&f=b&v=1.4&c=7262&r=http%3A//www.naturewallpaper.net/birds_L.html	02/02/2005 14:18	02/02/2005 14:18	FALSE	1
snow_geese.jpg	http://www.naturewallpaper.net/birdsLpages/image21.html	02/02/2005 14:18	02/02/2005 14:18	FALSE	1
	http://pagead2.googlesyndication.com/pagead/ads?client=ca-pub-0241683974610684&dt=1107353925746&lmt=1107353925&forma	02/02/2005 14:18	02/02/2005 14:18	FALSE	1
	http://pagead2.googlesyndication.com/pagead/adclick?sa=L&ai=Bv4uhneAAQrfmAqX-QcmCpMoK0MuACPLnwJwBwI23AcC4AhACGAIg0	02/02/2005 14:19	02/02/2005 14:19	FALSE	1
	http://pagead2.googlesyndication.com/pagead/iclk?sa=l&ai=Bv4uhneAAQrfmAqX-QcmCpMoK0MuACPLnwJwBwI23AcC4AhACGAIg05r2	02/02/2005 14:19	02/02/2005 14:19	FALSE	1
SHOP.COM - Search results for bald eagle	http://uk.shop.com/amos/cc/main/ccn_search_catsa/st/bald+eagle/sy/products/ccsyn/518/SourceID/30	02/02/2005 14:19	02/02/2005 14:19	FALSE	1
SHOP.COM - Bird Safari - Bird Watcher's Paradise from Choices Direct - Movies is available in Documentary	http://amos.shop.com/amos/cc/main/catalog/pcd/7107298/prd/10187717/ccsyn/518/_x_/Choices-Direct---Movies-Bird-Safari---Bird-	02/02/2005 14:20	02/02/2005 14:20	FALSE	1
Google Search: bird stories	http://www.google.co.uk/search?hl=en&client=firefox-a&rls=org.mozilla%3Aen-GB%3Aofficial&q=bird+stories&btnG=Search&meta=	02/02/2005 14:22	02/02/2005 14:22	FALSE	1
Untitled Document	http://z.about.com/0/ip/496/0.htm	02/02/2005 14:22	02/02/2005 14:26	FALSE	8
Click Here!	http://n479ad.doubleclick.net/adi/abt.hobbies/hobbies_birding;svc=;site=birding;t=14;pc=1;fd=0;fs=0;a=;sbj=pid512;kw=;chan=hobbies	02/02/2005 14:22	02/02/2005 14:22	FALSE	1
	http://z.about.com/0/ip/512/6.htm	02/02/2005 14:22	02/02/2005 14:26	FALSE	8
	http://z.about.com/0/ip/512/12.htm	02/02/2005 14:22	02/02/2005 14:26	FALSE	8
Google Offers	http://z.about.com/5/ad/go.htm?gs=birding	02/02/2005 14:22	02/02/2005 14:26	FALSE	8
	http://z.about.com/0/ip/417/5.htm?CDN=hobbies	02/02/2005 14:22	02/02/2005 14:26	FALSE	8
Bird Stories and Tales	http://birding.about.com/od/storie1/	02/02/2005 14:22	02/02/2005 14:22	FALSE	1
Audience Match Data Agent	http://z.about.com/5/ad/am.htm?pid=about	02/02/2005 14:22	02/02/2005 14:26	FALSE	8
Click Here!	http://n479ad.doubleclick.net/adi/abt.hobbies/hobbies_birding;svc=;site=birding;t=14;pc=1;fd=0;fs=0;a=;sbj=pid512;kw=;chan=hobbies	02/02/2005 14:22	02/02/2005 14:22	FALSE	1
Current Headlines	http://z.about.com/6/o/b.htm?gs=birding	02/02/2005 14:22	02/02/2005 14:26	FALSE	7
	http://z.about.com/7/o/cw.htm?gs=birding	02/02/2005 14:23	02/02/2005 14:26	FALSE	6
Click Here!	http://n479ad.doubleclick.net/adi/abt.hobbies/hobbies_birding;svc=;site=birding;t=0;pc=2;fd=0;fs=0;a=;sbj=pid512;kw=;chan=hobbies;	02/02/2005 14:23	02/02/2005 14:23	FALSE	1
Related Articles	http://z.about.com/5/o/c.htm?gs=birding	02/02/2005 14:23	02/02/2005 14:26	FALSE	6
Click Here!	http://n479ad.doubleclick.net/adi/abt.hobbies/hobbies_birding;svc=;site=birding;t=0;pc=2;fd=0;fs=0;a=;sbj=pid512;kw=;chan=hobbies;	02/02/2005 14:23	02/02/2005 14:23	FALSE	1
Click Here!	http://n479ad.doubleclick.net/adi/abt.hobbies/hobbies_birding;svc=;site=birding;t=0;pc=2;fd=0;fs=0;a=;sbj=pid512;kw=;chan=hobbies;	02/02/2005 14:23	02/02/2005 14:23	FALSE	1
Wings of Terror - avian humor article for people interesting in birdwatching and others interested in birds	http://birding.about.com/library/weekly/aa102598.htm	02/02/2005 14:23	02/02/2005 14:23	FALSE	1
Click Here!	http://n479ad.doubleclick.net/adi/abt.hobbies/hobbies_birding;svc=;site=birding;t=0;pc=3;fd=0;fs=0;a=;sbj=pid512;kw=;chan=hobbies;	02/02/2005 14:23	02/02/2005 14:23	FALSE	1
Alphabetical Index of Birds	http://birding.about.com/library/blalphatypeofbird.htm	02/02/2005 14:23	02/02/2005 14:23	FALSE	1
	http://clk.about.com/?zi=18/yV&sdn=hobbies_birding&tm=51&f=00&su=p512.6.140.ip_p512.12.140.ip_&tt=0&zu=http%3A//birding.ab	02/02/2005 14:23	02/02/2005 14:23	FALSE	1
Click Here!	http://n479ad.doubleclick.net/adi/abt.hobbies/hobbies_birding;svc=;site=birding;t=0;pc=3;fd=0;fs=0;a=;sbj=pid512;kw=;chan=hobbies;	02/02/2005 14:23	02/02/2005 14:23	FALSE	1
Click Here!	http://n479ad.doubleclick.net/adi/abt.hobbies/hobbies_birding;svc=;site=birding;t=0;pc=3;fd=0;fs=0;a=;sbj=pid512;kw=;chan=hobbies;	02/02/2005 14:23	02/02/2005 14:23	FALSE	1
Click Here!	http://n479ad.doubleclick.net/adi/abt.hobbies/hobbies_birding;svc=;site=birding;t=0;pc=4;fd=0;fs=0;a=;sbj=pid512;kw=;chan=hobbies;	02/02/2005 14:24	02/02/2005 14:24	FALSE	1
	http://clk.about.com/?zi=18/yV&sdn=hobbies_birding&tm=20&f=00&su=p512.6.140.ip_p512.12.140.ip_&tt=0&zu=http%3A//birding.ab	02/02/2005 14:24	02/02/2005 14:24	FALSE	1
Specs for Building Birdhouses and for use in Bird House Plans	http://birding.about.com/library/blhousespecs.htm	02/02/2005 14:24	02/02/2005 14:24	FALSE	1
Click Here!	http://n479ad.doubleclick.net/adi/abt.hobbies/hobbies_birding;svc=;site=birding;t=0;pc=4;fd=0;fs=0;a=;sbj=pid512;kw=;chan=hobbies;	02/02/2005 14:24	02/02/2005 14:24	FALSE	1
Click Here!	http://n479ad.doubleclick.net/adi/abt.hobbies/hobbies_birding;svc=;site=birding;t=0;pc=4;fd=0;fs=0;a=;sbj=pid512;kw=;chan=hobbies;	02/02/2005 14:24	02/02/2005 14:24	FALSE	1
Click Here!	http://n479ad.doubleclick.net/adi/abt.hobbies/hobbies_birding;svc=;site=birding;t=14;pc=5;fd=0;fs=0;a=;sbj=pid512;kw=;chan=hobbies	02/02/2005 14:24	02/02/2005 14:24	FALSE	1
How to Build Bird Houses and Nest Boxes	http://birding.about.com/od/buildhouses/	02/02/2005 14:24	02/02/2005 14:24	FALSE	1
Click Here	http://n479ad.doubleclick.net/adi/abt.hobbies/hobbies_birding;svc=;site=birding;t=14;pc=5;fd=0;fs=0;a=;sbj=pid512;kw=;chan=hobbies	02/02/2005 14:24	02/02/2005 14:24	FALSE	1
Click Here!	http://n479ad.doubleclick.net/adi/abt.hobbies/hobbies_birding;svc=;site=birding;t=14;pc=5;fd=0;fs=0;a=;sbj=pid512;kw=;chan=hobbies	02/02/2005 14:24	02/02/2005 14:24	FALSE	1
	http://birding.about.com/cs/buildhouses/index.htm	02/02/2005 14:24	02/02/2005 14:24	FALSE	1
Click Here!	http://n479ad.doubleclick.net/adi/abt.hobbies/hobbies_birding;svc=;site=birding;t=2;pc=6;fd=0;fs=0;a=;sbj=pid512;kw=;chan=hobbies;	02/02/2005 14:24	02/02/2005 14:24	FALSE	1
Click Here!	http://n479ad.doubleclick.net/adi/abt.hobbies/hobbies_birding;svc=;site=birding;t=2;pc=6;fd=0;fs=0;a=;sbj=pid512;kw=;chan=hobbies;	02/02/2005 14:24	02/02/2005 14:24	FALSE	1
Click Here!	http://n479ad.doubleclick.net/adi/abt.hobbies/hobbies_birding;svc=;site=birding;t=2;pc=6;fd=0;fs=0;a=;sbj=pid512;kw=;chan=hobbies;	02/02/2005 14:24	02/02/2005 14:24	FALSE	1
Free Feeder and Birdhouse Plans Index	http://birding.about.com/cs/birdhousesfeeders/a/buildingindex.htm	02/02/2005 14:24	02/02/2005 14:24	FALSE	1
vonage_vpart_gothrubiz_336	http://view.atdmt.com/VON/iview/btcmxvon0260000015von/direct/01?click=http://n479ad.doubleclick.net/click%3Bh=v4|3213|3|0	02/02/2005 14:24	02/02/2005 14:24	FALSE	1
Birding and Birdwatching - Build a Bluebird Nest Box for Wild Birds	http://birding.about.com/library/weekly/aa010703a.htm	02/02/2005 14:24	02/02/2005 14:24	FALSE	1
Click Here!	http://n479ad.doubleclick.net/adi/abt.hobbies/hobbies_birding;svc=;site=birding;t=0;pc=7;fd=0;fs=0;a=;sbj=pid512;kw=;chan=hobbies;	02/02/2005 14:24	02/02/2005 14:24	FALSE	1
Click Here!	http://n479ad.doubleclick.net/adi/abt.hobbies/hobbies_birding;svc=;site=birding;t=0;pc=7;fd=0;fs=0;a=;sbj=pid512;kw=;chan=hobbies;	02/02/2005 14:24	02/02/2005 14:24	FALSE	1
Click Here!	http://n479ad.doubleclick.net/adi/abt.hobbies/hobbies_birding;svc=;site=birding;t=0;pc=7;fd=0;fs=0;a=;sbj=pid512;kw=;chan=hobbies;	02/02/2005 14:24	02/02/2005 14:24	FALSE	1
Birding and Birdwatching - Painting or Staining Bird Houses and Feeders	http://birding.about.com/library/blhousefeederpaint.htm	02/02/2005 14:26	02/02/2005 14:26	FALSE	1
Click Here!	http://n479ad.doubleclick.net/adi/abt.hobbies/hobbies_birding;svc=;site=birding;t=0;pc=8;fd=0;fs=0;a=;sbj=pid512;kw=;chan=hobbies;	02/02/2005 14:26	02/02/2005 14:26	FALSE	1
Click Here!	http://n479ad.doubleclick.net/adi/abt.hobbies/hobbies_birding;svc=;site=birding;t=0;pc=8;fd=0;fs=0;a=;sbj=pid512;kw=;chan=hobbies;	02/02/2005 14:26	02/02/2005 14:26	FALSE	1
Click Here!	http://n479ad.doubleclick.net/adi/abt.hobbies/hobbies_birding;svc=;site=birding;t=0;pc=8;fd=0;fs=0;a=;sbj=pid512;kw=;chan=hobbies;	02/02/2005 14:26	02/02/2005 14:26	FALSE	1
	http://clk.about.com/?zi=18/yW&sdn=hobbies_birding&tm=107&f=00&su=p512.6.140.ip_p512.12.140.ip_&tt=0&zu=http%3A//birding.	02/02/2005 14:26	02/02/2005 14:26	FALSE	1
	http://pagead2.googlesyndication.com/pagead/iclk?sa=l&ai=BiW5-JeMAQviVFI7YQa3yjJsK_PzSBq7nwZQBwI23AaCzIxABGAEgvKX3ASgI	02/02/2005 14:27	02/02/2005 14:27	FALSE	1
	http://pagead2.googlesyndication.com/pagead/adclick?sa=L&ai=BiW5-JeMAQviVFI7YQa3yjJsK_PzSBq7nwZQBwI23AaCzIxABGAEgvKX3A	02/02/2005 14:27	02/02/2005 14:27	FALSE	1
Haith's Wild Bird Foods & Bill Oddie's tips and advice also bird feeder, peanut, birdseed, bird, garden birds, wildlife, nest box, bird table, birdcare, binocular, bird bath, squirrel, robin, books, videos & wildflower seeds,	http://www.haiths.com/	02/02/2005 14:27	02/02/2005 14:27	FALSE	1
Haith's Wild Bird Foods & Bill Oddie's tips and advice also bird feeder, peanut, birdseed, bird, garden birds, wildlife, nest box, bird table, birdcare, binocular, bird bath, squirrel, robin, books, videos & wildflower seeds,	http://www.haiths.com/Features.asp?lookup=0&brand=1&article_id=features_1&customer_id=PAA0219022305524FFFKSRSZKKXZGR	02/02/2005 14:28	02/02/2005 14:28	FALSE	1
The Birds (1963)	http://www.imdb.com/title/tt0056869/	02/02/2005 14:40	02/02/2005 14:40	FALSE	1
	http://www.imdb.com/google/box?num=3;k=power100-withsc;placement=midbucket;rnd=45504;sid=7845;referer=%2Ftitle%2Ftt005686	02/02/2005 14:40	02/02/2005 14:40	FALSE	1
Trailers for The Birds (1963)	http://www.imdb.com/title/tt0056869/trailers	02/02/2005 14:40	02/02/2005 14:40	FALSE	1
	http://www.imdb.com/google/box?num=3;k=power100-withsc;placement=midbucket;rnd=83932;sid=8055;referer=%2Ftitle%2Ftt005686	02/02/2005 14:40	02/02/2005 14:40	FALSE	1
	http://rcm.amazon.com/e/cm?f=ifr&t=imdb-rec-banner-20&l=st1&search=widescreen&mode=dvd&p=13&o=1	02/02/2005 14:40	02/02/2005 14:40	FALSE	1
Video Gallery for The Birds (1963)	http://www.imdb.com/rg/title-tease/trailers/title/tt0056869/trailers	02/02/2005 14:40	02/02/2005 14:40	FALSE	1
IMDB LINKING TO VIDEO DETECTIVE	http://www.imdb.com/google/box?num=5;k=maxww-sky;placement=2;rnd=872225854982059300;sid=-123;referer=maxww;slot=TOP_R	02/02/2005 14:40	02/02/2005 14:40	FALSE	1
	http://www.imdb.com/rg/TITLETRA_VIDDET//http://videodetective.com/home.asp?PublishedID=1843	02/02/2005 14:41	02/02/2005 14:41	FALSE	1
VideoDetective.com - Movie Trailers, Entertainment Previews, Streaming Video Samples.	http://videodetective.com/home.asp?PublishedID=1843	02/02/2005 14:41	02/02/2005 14:41	FALSE	1
	http://videodetective.com/test.asp?List=307629|838353&PublishedID=1843&ListID=&New=&CustomerId=97135&refreshed=TRUE	02/02/2005 14:41	02/02/2005 14:41	FALSE	1
	http://videodetective.com/test.asp?List=307629|838353&PublishedID=1843&ListID=&New=&CustomerId=97135	02/02/2005 14:41	02/02/2005 14:41	FALSE	1
	http://videodetective.com/player.asp?PublishedId=1843&List=307629|838353&Customerid=97135	02/02/2005 14:41	02/02/2005 14:41	FALSE	1
Video Detective Player	http://videodetective.com/choosespeed.asp?BrowserSupportActiveX=false&ActiveXPlayerInstalled=false&plugin=true&List=307629|83	02/02/2005 14:42	02/02/2005 14:42	FALSE	1
	http://videodetective.com/Playlist.asp?	02/02/2005 14:42	02/02/2005 14:42	FALSE	1
	http://videodetective.com/titleinfo.asp	02/02/2005 14:42	02/02/2005 14:42	FALSE	1
Videodetective.com - Player	http://videodetective.com/player.asp?PublishedId=1843&List=307629|838353&CustomerID=97135&videokbrate=300	02/02/2005 14:42	02/02/2005 14:42	FALSE	1
	http://videodetective.com/play.asp?New=True&List=307629|838353&PublishedId=1843&VideoKbrate=300&ListID=&CustomerId=9713	02/02/2005 14:42	02/02/2005 14:42	FALSE	1
BBC NEWS | News Front Page	http://news.bbc.co.uk/	02/02/2005 14:44	02/02/2005 14:44	FALSE	2
	http://news.bbc.co.uk/nol/ukfs_news/hi/front_page/ticker.stm	02/02/2005 14:44	02/02/2005 14:44	FALSE	1
BBC NEWS | Politics | Blair defends house arrest plans	http://news.bbc.co.uk/1/hi/uk_politics/4227829.stm	02/02/2005 14:44	02/02/2005 14:44	FALSE	1
BBC Media Selector	http://www.bbc.co.uk/mediaselector/check/nolavconsole/ukfs_news/hi?redirect=fs.stm&news=1&bbram=1&bbwm=1&nbram=1&nbwn	02/02/2005 14:45	02/02/2005 14:45	FALSE	1
	http://news.bbc.co.uk/1/hi/uk_politics/4227829.stm#	02/02/2005 14:45	02/02/2005 14:45	FALSE	1
BBC NEWS | UK | Blair defends house arrest plans	http://news.bbc.co.uk/nolavconsole/ukfs_news/hi/newsid_4220000/newsid_4229700/bb_rm_4229711.stm	02/02/2005 14:45	02/02/2005 14:45	FALSE	1
Untitled	http://news.bbc.co.uk/nolavconsole/shared/player/player.stm?clipurl=http://news.bbc.co.uk/media/news_web/video/40545000/bb/4	02/02/2005 14:45	02/02/2005 14:45	FALSE	1
Untitled	http://news.bbc.co.uk/nolavconsole/ukfs_news/hi/uk/bb_rm_promo.stm	02/02/2005 14:45	02/02/2005 15:04	FALSE	2
	http://news.bbc.co.uk/nolavconsole/ukfs_news/hi/front_page/bb_rm_promo.stm	02/02/2005 14:45	02/02/2005 14:45	FALSE	1
Untitled	http://news.bbc.co.uk/nolavconsole/shared/player/player.stm?title=Blair%20defends%20house%20arrest%20plans&clipurl=http://nev	02/02/2005 14:45	02/02/2005 15:04	FALSE	2
	http://news.bbc.co.uk/nolavconsole/ukfs_news/hi/front_page/bb_rm_banner.stm	02/02/2005 14:45	02/02/2005 14:45	FALSE	1
BBC Media Selector	http://www.bbc.co.uk/cgi-perl/mediaselector/app.pl?action=sc&alreadySeen=1&m=%2Fnolavconsole%2Fukfs_news%2Fhi&q=nbram%3	02/02/2005 14:45	02/02/2005 14:45	FALSE	1
	http://news.bbc.co.uk/nolavconsole/ukfs_news/hi/uk/bb_rm_banner.stm	02/02/2005 14:45	02/02/2005 15:04	FALSE	2
	http://www.bbc.co.uk/mediaselector/check/nolavconsole/ukfs_news/hi?redirect=fs.stm&nbram=1&news=1&bbwm=1&nbwm=1&bbran	02/02/2005 14:45	02/02/2005 14:45	FALSE	1
BBC News Player	http://news.bbc.co.uk/nolavconsole/ukfs_news/hi/bb_rm_fs.stm?checkedBandwidth=bb&nbram=1&checkedMedia=ram&news=1&nbw	02/02/2005 14:45	02/02/2005 14:45	FALSE	1
BBC NEWS | Scotland	http://news.bbc.co.uk/1/hi/scotland/default.stm	02/02/2005 15:11	02/02/2005 15:11	FALSE	1
	http://www.pbs.org/lifeofbirds/songs/kakapo.ram	02/02/2005 15:11	02/02/2005 15:11	FALSE	1
	http://www.pbs.org/lifeofbirds/songs/dawn.ram	02/02/2005 15:12	02/02/2005 15:12	FALSE	1
Google Search: windows gnupg	http://www.google.co.uk/search?q=windows+gnupg&sourceid=mozilla-search&start=0&start=0&ie=utf-8&oe=utf-8&client=firefox-a&rl	02/02/2005 15:57	02/02/2005 15:57	FALSE	1
	http://www.gnupg.org/download.html	02/02/2005 15:57	02/02/2005 15:57	FALSE	1
Download - GnuPG.org	http://www.gnupg.org/download/	02/02/2005 15:57	02/02/2005 15:57	FALSE	1
WinPT	http://www.winpt.org/	02/02/2005 15:58	02/02/2005 15:58	FALSE	1
	http://www.stud.uni-hannover.de/~twoaday/winpt.html	02/02/2005 15:58	02/02/2005 15:58	FALSE	1
Google Search: windows gnupg	http://www.google.co.uk/search?q=windows+gnupg&hl=en&lr=&client=firefox-a&rls=org.mozilla:en-GB:official&start=10&sa=N	02/02/2005 15:58	02/02/2005 15:58	FALSE	1
GnuPG Windows	http://openpgp.vie-privee.org/wingpg.html	02/02/2005 15:58	02/02/2005 15:58	FALSE	1
Microsoft Application Search	http://shell.windows.com/fileassoc/0409/xml/redir.asp?Ext=pdf	02/02/2005 16:51	02/02/2005 16:51	FALSE	1
	http://shell.windows.com/fileassoc/0409/SearchEngine.asp	02/02/2005 16:51	02/02/2005 16:51	FALSE	1
Adobe Reader - Download	http://www.adobe.com/products/acrobat/readstep2.html	02/02/2005 16:52	02/02/2005 16:52	FALSE	1
Adobe Reader - Download Thank you	http://www.adobe.com/products/acrobat/readstep_servefile.html?hasjavascript=1&esdcanbeused=1&esdcanhandle=0&language=Eng	02/02/2005 16:52	02/02/2005 16:52	FALSE	1
	http://ardownload.adobe.com/pub/adobe/reader/win/7x/7.0/enu/AdbeRdr70_enu_full.exe	02/02/2005 16:53	02/02/2005 16:53	FALSE	1
Google Search: bird mating calls	http://www.google.co.uk/search?client=firefox-a&rls=org.mozilla%3Aen-GB%3Aofficial_s&hl=en&q=bird+mating+calls&meta=&btnG=G	03/02/2005 12:21	03/02/2005 12:21	FALSE	1
Chickadee Karaoke	http://whyfiles.org/shorties/104chick_sex/	03/02/2005 12:21	03/02/2005 12:21	FALSE	1
Google Image Search	http://www.google.co.uk/imghp?hl=en&tab=wi&client=firefox-a&rls=org.mozilla:en-GB:official_s&q=	03/02/2005 14:59	03/02/2005 14:59	FALSE	1
Google Search: young chicks	http://images.google.co.uk/images?client=firefox-a&rls=org.mozilla%3Aen-GB%3Aofficial_s&q=young+chicks&hl=en&btnG=Google+Sea	03/02/2005 14:59	03/02/2005 14:59	FALSE	1

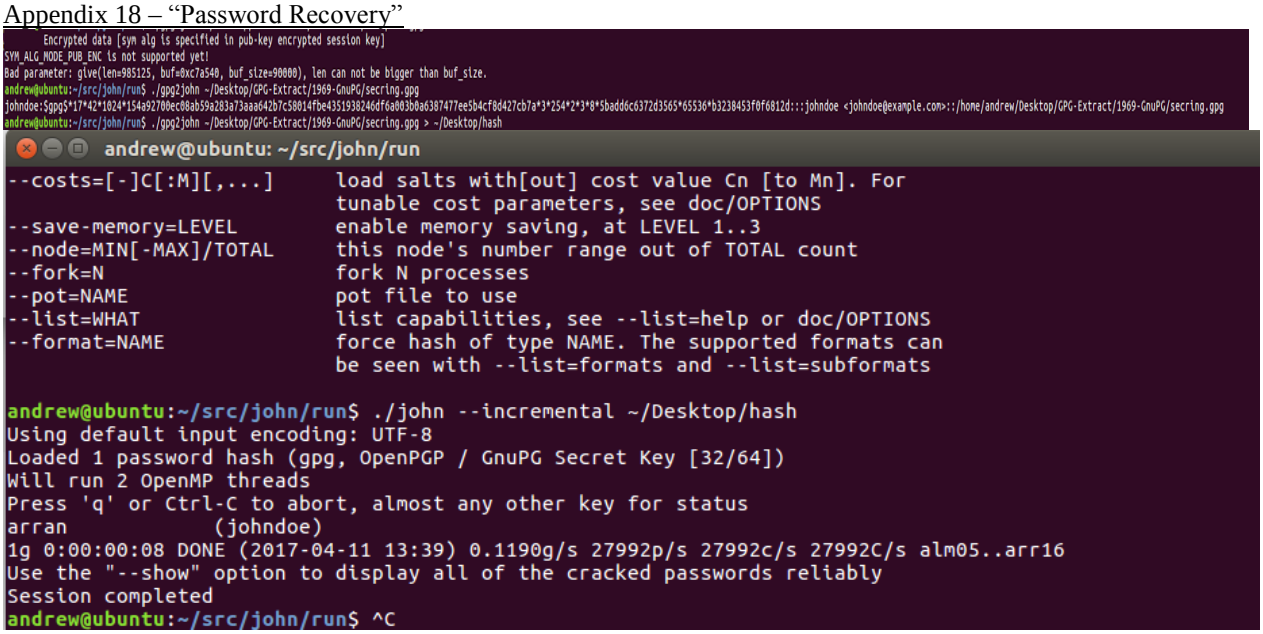
Google Image Result for http://freespace.virgin.net/cobber.budgies/images/babyscot_vyoung.jpg	http://images.google.co.uk/imgres?imgurl=http://freespace.virgin.net/cobber.budgies/images/babyscot_vyoung.jpg&imgrefurl=http://fr	03/02/2005 14:59	03/02/2005 14:59	FALSE	1
	http://images.google.co.uk/imgres?imgurl=http://freespace.virgin.net/cobber.budgies/images/babyscot_vyoung.jpg&imgrefurl=http://fr	03/02/2005 14:59	03/02/2005 14:59	FALSE	1
Scottie's Baby Pictures - 1	http://freespace.virgin.net/cobber.budgies/stories/scottie_a.html	03/02/2005 14:59	03/02/2005 14:59	FALSE	1
Google Image Result for http://www.insaneanimals.com/items/177.jpg	http://images.google.co.uk/imgres?imgurl=http://www.insaneanimals.com/items/177.jpg&imgrefurl=http://www.insaneanimals.com/it	03/02/2005 15:01	03/02/2005 15:01	FALSE	1
	http://images.google.co.uk/imgres?imgurl=http://www.insaneanimals.com/items/177.jpg&imgrefurl=http://www.insaneanimals.com/fr	03/02/2005 15:01	03/02/2005 15:01	FALSE	1
Young Chicks - Funny Animals, Pets, Cats and Dogs Pictures - Insane Animals	http://www.insaneanimals.com/funny-animals/177.html?sort=date	03/02/2005 15:01	03/02/2005 15:01	FALSE	1
	http://pagead2.googlesyndication.com/pagead/ads?client=ca-pub-2066660325911329&dt=1107442877733&format=120x600_as&ou	03/02/2005 15:01	03/02/2005 15:01	FALSE	1
	http://media.fastclick.net/w/get.media?tn=&sid=13470&m=3&f=fs&v=1.48c=7098&r=http%3A//images.google.co.uk/imgres%3Fimgurl%	03/02/2005 15:01	03/02/2005 15:01	FALSE	1
Google Search: young chicks	http://images.google.co.uk/images?q=young+chicks&hl=en&lr=&client=firefox-a&rls=org.mozilla:en-GB:official_s&start=20&sa=N	03/02/2005 15:01	03/02/2005 15:01	FALSE	1
	http://www.cvm.okstate.edu/instruction/kocan/ostrich/ostbk2b2.htm	03/02/2005 15:02	03/02/2005 15:02	FALSE	1
	http://images.google.co.uk/imgres?imgurl=http://www.cvm.okstate.edu/instruction/kocan/disk2/images/img0056.jpg&imgrefurl=http:/	03/02/2005 15:02	03/02/2005 15:02	FALSE	1
Google Image Result for http://www.cvm.ok.state.edu/instruction/kocan/disk2/images/img0056.jpg	http://images.google.co.uk/imgres?imgurl=http://www.cvm.okstate.edu/instruction/kocan/disk2/images/img0056.jpg&imgrefurl=http:/	03/02/2005 15:02	03/02/2005 15:02	FALSE	1
Google Search: young chicks	http://images.google.co.uk/images?q=young+chicks&hl=en&lr=&client=firefox-a&rls=org.mozilla:en-GB:official_s&start=40&sa=N	03/02/2005 15:03	03/02/2005 15:03	FALSE	1
	http://images.google.co.uk/imgres?imgurl=http://people.cornell.edu/pages/sah67/chicks2.jpg&imgrefurl=http://people.cornell.edu/pa	03/02/2005 15:03	03/02/2005 15:03	FALSE	1
Eco Gallery 04	http://people.cornell.edu/pages/sah67/summer.html	03/02/2005 15:03	03/02/2005 15:03	FALSE	1
Google Image Result for http://people.cornell.edu/pages/sah67/chicks2.jpg	http://images.google.co.uk/imgres?imgurl=http://people.cornell.edu/pages/sah67/chicks2.jpg&imgrefurl=http://people.cornell.edu/pa	03/02/2005 15:03	03/02/2005 15:03	FALSE	1
Google Search: bird screensavers	http://www.google.co.uk/search?client=firefox-a&rls=org.mozilla%3Aen-GB%3Aoffical_s&hl=en&q=bird+screensavers&meta=&btnG=G	09/02/2005 11:27	09/02/2005 11:27	FALSE	1
Screensavers	http://www.traveltex.com/screen.asp?SN=6245300&LS=0&SS=1	09/02/2005 11:27	09/02/2005 11:27	FALSE	2
Screensavers	http://www.traveltex.com/screen.asp?SN=6245300&LS=0&SS=1	09/02/2005 11:27	09/02/2005 11:27	TRUE	1
	http://www.trav+B3:B171eltex.com/downloads/screensavers/birds.zip	09/02/2005 11:27	09/02/2005 11:27	FALSE	1

Appendix 17 – "aa010703a.htm"





Appendix 18 – “Password Recovery”



Appendix 19 – "Mismatched Extension MRB"

32116-_I_M_G___3_9_3_7___f_i_l_t_e_r_e_d_._j_p_g_

32117-_c_u_t_e___p_e_n_g_u_i_n_._j_p_g_

31307-FantailFrontView

32115-_7_E_Y_B_T_E_L_F_1_K_A_N_

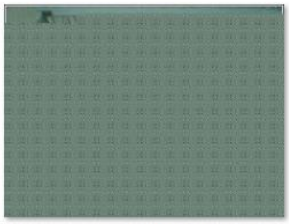
32118-_B_C_7_ _f_e_e_d_i_n_g_ _t_h_e_ _b_i_r_d_s_._j_p_g_

32119-_g_l_f_s_-_s_t_o_r_m_-_b_i_r_d_s_._j_p_g_

32120-_c_o_l_o_r_f_u_l_-_b_i_r_d_s_._j_p_g_

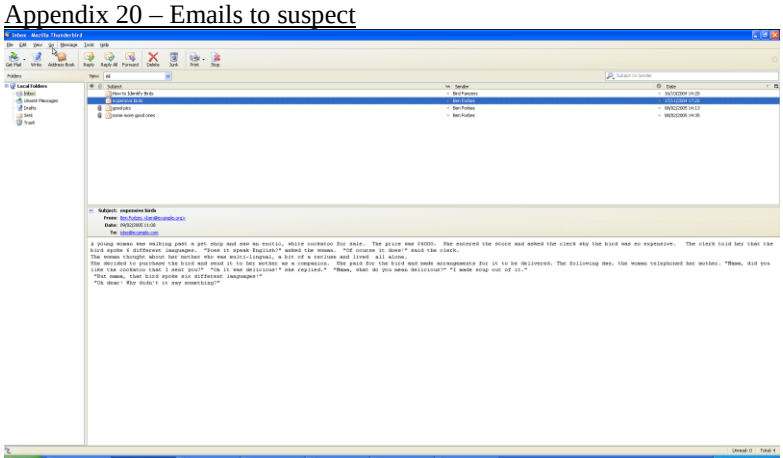
32121-_I_M_G___3_9_3_7___f_i_l_t_e_r_e_d_._j_p_g_

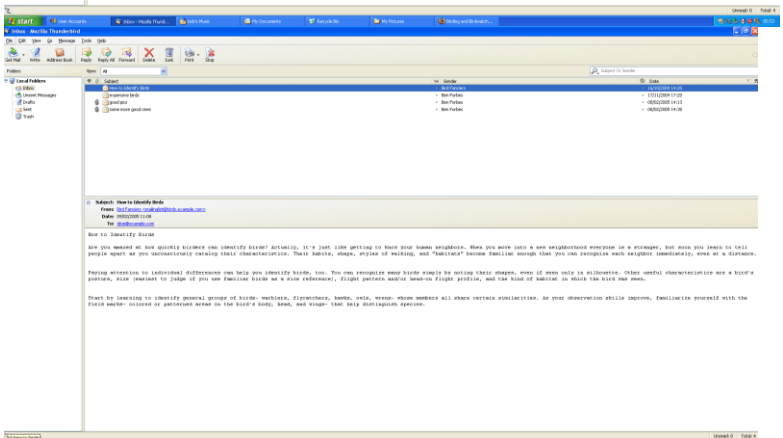
32122-_g_a_w_a_l_l_8_._j_p_g_jpg

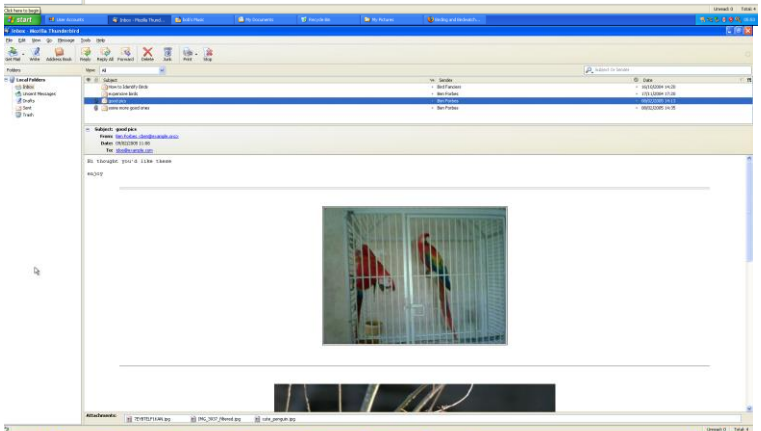


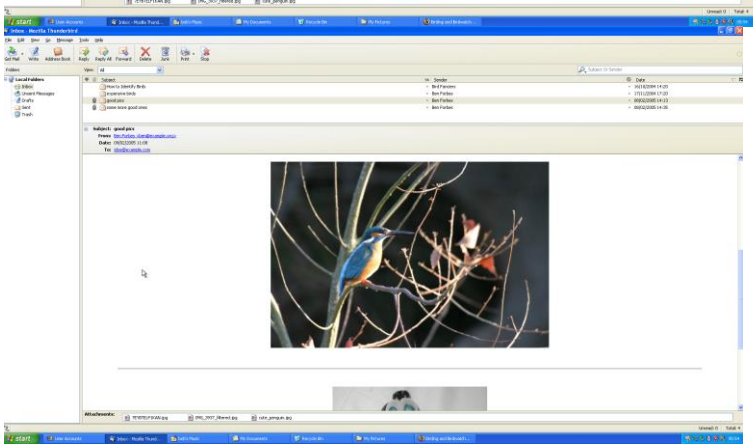
34195-_7_E_Y_B_T_E_L_F_1_K_A_N_._j_p_g

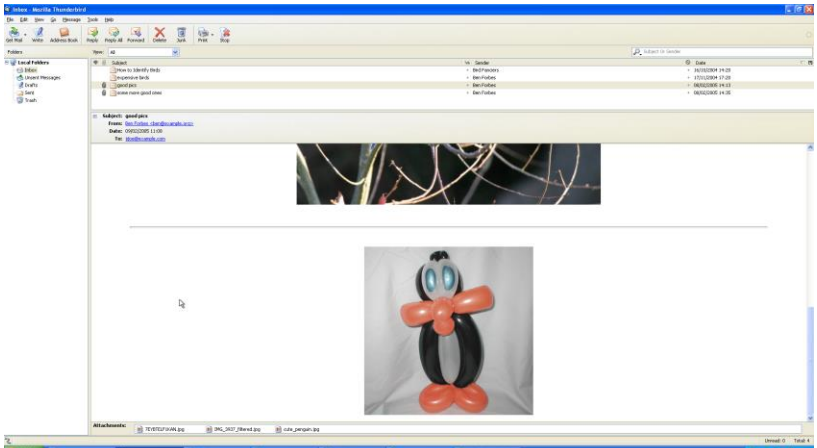
Appendix 20 – Emails to suspect

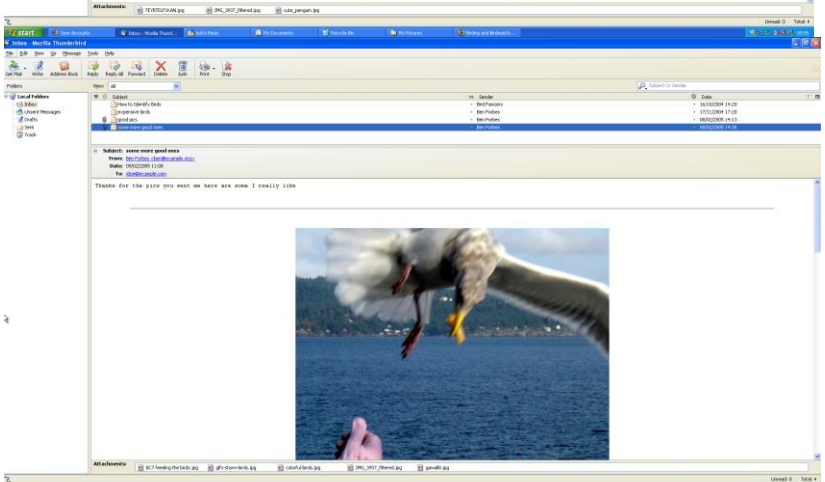


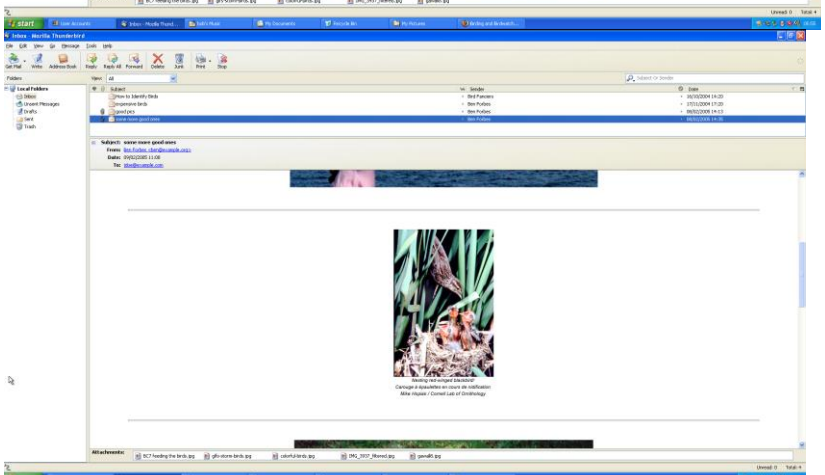


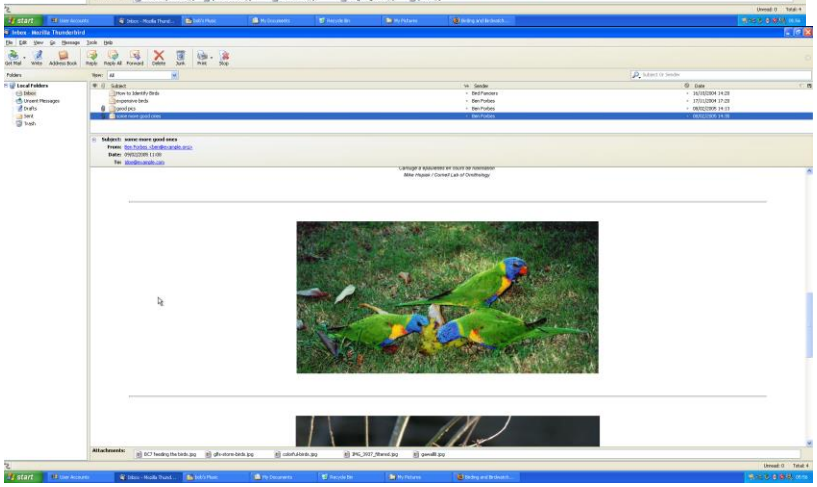


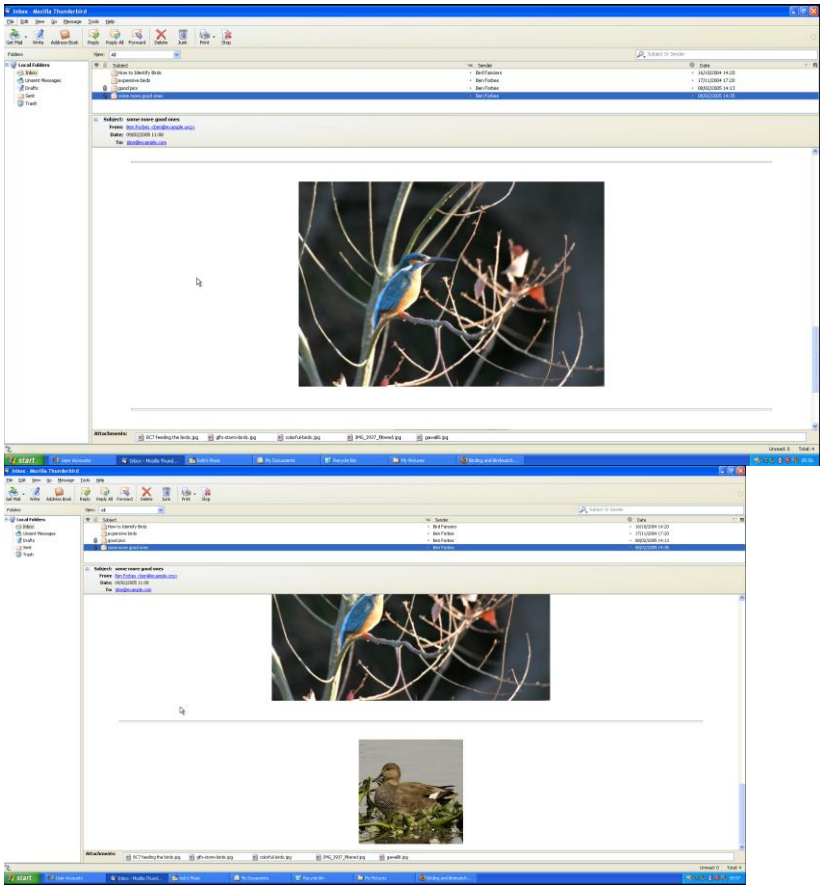




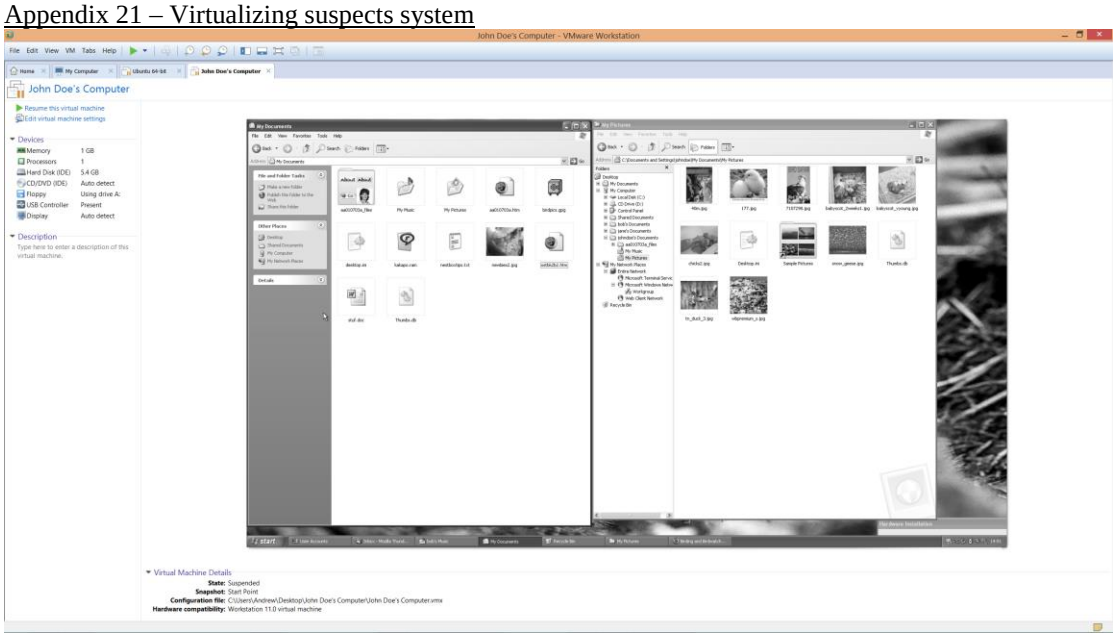




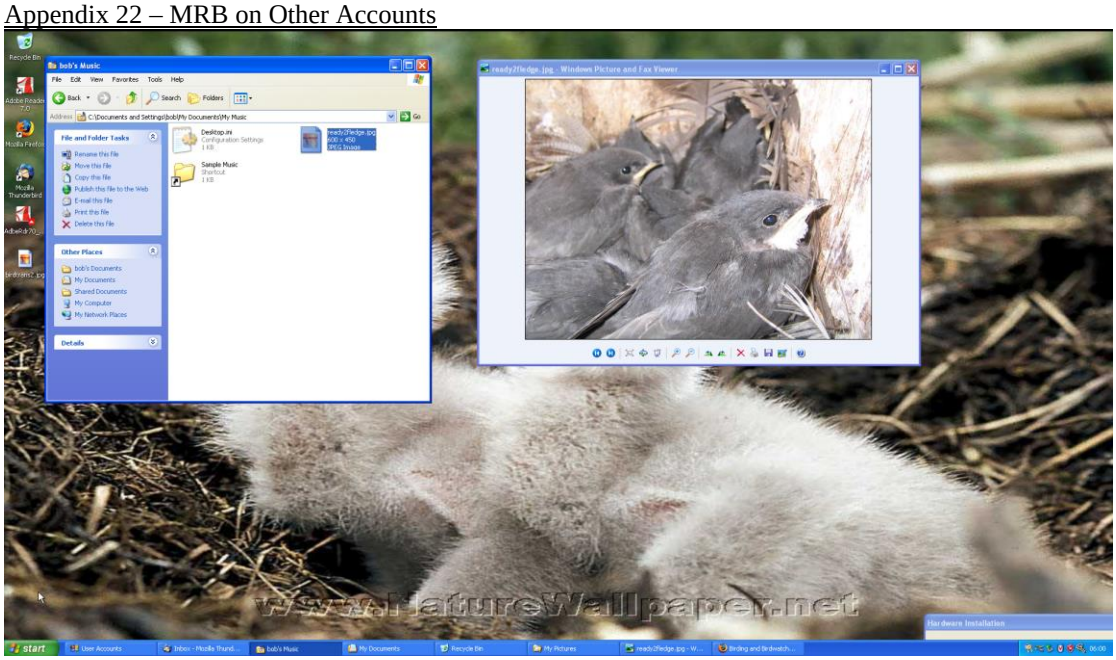




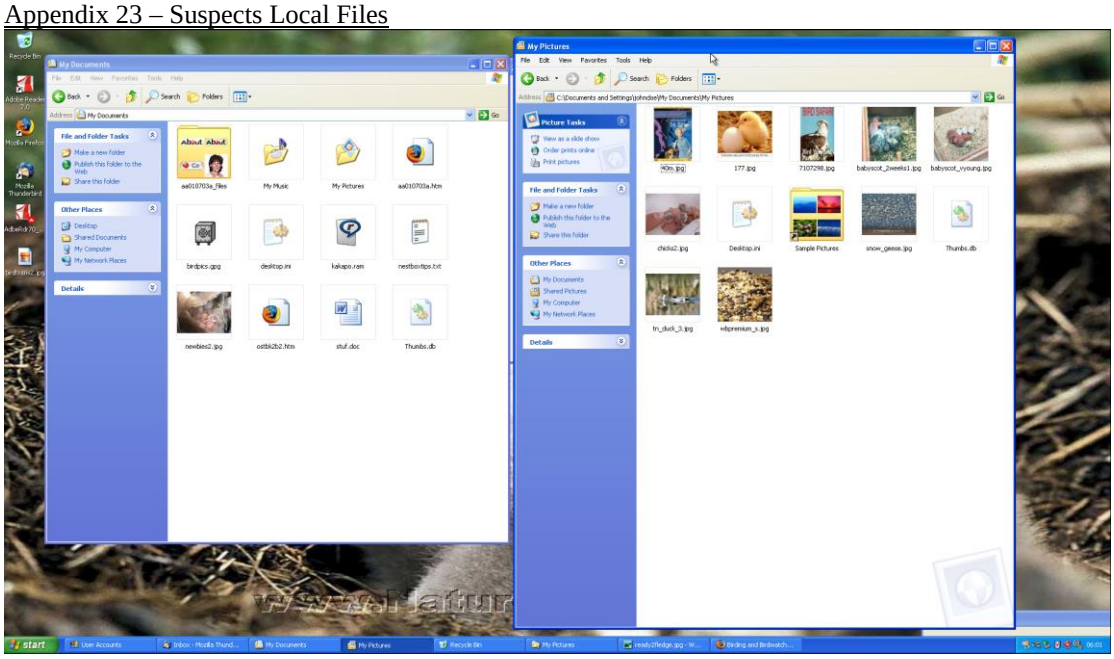
Appendix 21 – Virtualizing suspects system



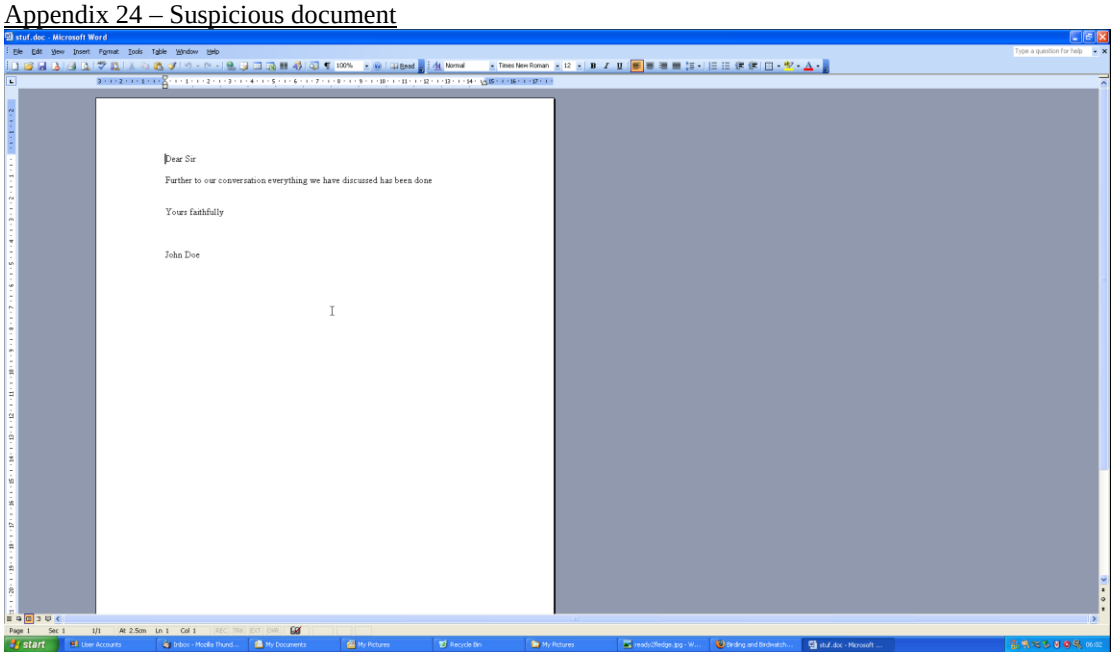
Appendix 22 – MRB on Other Accounts



Appendix 23 – Suspects Local Files



Appendix 24 – Suspicious document




```
Keywords:
Last-Author: John Doe
Last-Modified: 2005-02-09T16:57:00Z
Last-Save-Date: 2005-02-09T16:57:00Z
Page-Count: 1
Revision-Number: 2
Template: Normal.dot
Word-Count: 16
comment:
cp:revision: 2
cp:subject:
creator: John Doe
date: 2005-02-09T16:57:00Z
dc:creator: John Doe
dc:subject:
dc:title: Birds To Find
dcterms:created: 2005-02-09T16:51:00Z
dcterms:modified: 2005-02-09T16:57:00Z
extended-properties:Application: Microsoft Office Word
extended-properties:Company:
extended-properties:Template: Normal.dot
meta:author: John Doe
meta:character-count: 96
meta:creation-date: 2005-02-09T16:51:00Z
meta:keyword:
meta:last-author: John Doe
meta:page-count: 1
meta:save-date: 2005-02-09T16:57:00Z
meta:word-count: 16
modified: 2005-02-09T16:57:00Z
subject:
title: Birds To Find
w:comments:
xmpTPg:NPages: 1
```

Appendix 25 – Hidden Bird List


```
aggressive_song.wav.lnk-slack Birds To Find
Crow
Raven
Pigeon
Sparrow
Starling
Black bird
Robin
```

Appendix 26 – Account Privilege Level