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*Information contained in this document is for educational purposes.*

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<b>Unit name and Force:</b> Digital Forensic Unit of 3ensic Force	
<b>Case against:</b> John Doe	
<b>Police Reference No:</b> (if applicable)	
<b>Case Reference No:</b> (CCU or equivalent ref)	
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# INTRODUCTION

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## 1.1 EXECUTIVE SUMMARY

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During the investigation there were many different points of data found located on the drive. Specifically, several bird related images, audio files, literature, and more were discovered to have been downloaded onto the drive at varying dates. To begin, from the 13<sup>th</sup> to 27<sup>th</sup> of June 2004 there were 29 pictures taken on an external camera. From there, on the 16<sup>th</sup> of October 2004 an email was sent to John Doe from Bird Franciers. Afterwards, on the 17<sup>th</sup> of November 2004 a total of three emails from [ben@example.org](mailto:ben@example.org) were sent to John Doe. To follow on February 2<sup>nd</sup>, 2005, several downloads were executed on the drive as well as a plethora of web browser functions. For the next week, this behavior continued for several different dates. What commenced during his time with the drive aligns with the habits of a birdwatcher. Mr. Doe's fondness for avians never once appeared to be malicious, and thus the investigators can conclude that he had no ill intent with any of the files contained in the drive.

## 1.2 DESCRIPTION OF CRIME

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The crime involves a suspect named John Doe. He is thought to have been involved in crimes relating to birds, specifically ornithological images. During the investigation data ranging over several months 13/06/04 to 09/02/05 was collected relating to the crime. This starts off with John taking pictures on his personal camera, after this he starts receiving and sending emails from a person named Ben containing ornithological data. A few months later his interest in bird spikes again where he makes a plethora of google searches relating to birds and a tool to encrypt data then the next day, he downloads a mix of bird images and sounds. His final actions were on 09/02/2005 where he downloaded a zip file containing bird photos and then shut down his machine 4 hours later. This data was found by making use of different tools and techniques such as autopsy, FRED, foremost and many more which will be described throughout this report.

## **2 DESCRIPTION OF INVESTIGATION**

### **2.1 JOB DESCRIPTION AND INSTRUCTIONS**

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The Digital Forensic Unit of 3esnic has been approached by the University of Abertay in conjunction with Police Scotland to investigate into Mr John Doe, an individual who has been accused of the crimes Ornithological Misconduct, Bird Abuse, Possession of Indecent Bird-Related Imagery and Possession with Intent to Distribute Indecent Bird-Related Imagery. This will come in the form of a digital forensic examination of the alleged offender's personal devices.

The 3esnic team is comprised of 3 investigators Snow White, Kieran Bissett and Annie Place will be the primary analysts working on the personal devices looking for images and videos of bird abuse. However, all bird related content will be recorded for the record examples like browser search history, internet messaging relating to the procurement or the distribution of bird images and other documents that may provide evidence relevant to the investigation.

Prior to the report being written which will serve as a report for the court to deliberate over, all necessary information was passed on to the relevant teams either to ensure a thorough and well-informed investigation or to make sure any victims receive help they may need.

### **2.2 DESCRIPTION OF RECOVERED/EXAMINE ITEMS**

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The 3ensic forensic team were called out to the suspects' home to document and collect any digital evidence to then be taken back to the lab to be further analyzed.

The team found a PC which was turned off with an external HDD hard drive connected which was documented in the chain of evidence form and then bagged to be taken back to the lab to be analyzed in a forensic safe environment.

See Appendices A for images of HDD drive.

When the drive was taken back to the lab it was copied using dcfldd. The full size of the drive was 5.7GB and was separated into 3 partitions.

It was also partitioned to see what space was unallocated on the drive and to see what file system it was using.

By doing the partitioning it was found out that this drive has 3 partitions, the primary partition is known as 002 which is formatted in the NTFS/exFat format and is 3.1GB in size.

The second partition known as vol3 also had a multitude of illicit material, which was mostly bird imagery and bird-adjacent content.

## 2.3 ANALYSIS METHODOLOGY

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### 2.3.1 Disk Imaging

When analysing a drive with sensitive data within, one must proceed with a proper level of caution so that the integrity of the data is left unaltered. The original physical disk should not have any analysis conducted onto it so that any mistakes do not result in data being corrupted or loss.

With access to the physical drive, the investigators were given proper reimaging equipment which included a SATA/IDE/USB cable, a power cable, and a workstation. The USB cable was first attached to the evidence drive, followed by the power cable before the Linux workstation was booted with the drive attached. Once the drive was attached to the workstation and everything was powered on, dcfldd was installed via the command line with the following command:

```
sudo apt-get install dcfldd
```

With dcfldd installed, the evidence drive was copied over to the workstation with the following command:

```
sudo dcfldd if=/dev/sdA of=/home/admin/jd/johnDoe.dd
```

```
conv=notrunc,noerror,sync hash=md5 hashlog=/home/admin/jd
```

```
/johnDoeDrive.md5 bs=1406916 count=4096
```

To ensure that no data was lost in reimaging, an md5 hash was conducted on the drive to ensure that the size of the copy and the physical drives matched. With a value of d63dd1b8917ca28bac7c955fc3b6cd25, the drives were the same size, confirming no data was lost. Throughout the investigation, this step was conducted constantly to ensure at no point was data lost from the copied drive.

```
cmp209@cmp209-virtual-machine:~/jd$ md5sum johnDoe.dd
d63dd1b8917ca28bac7c955fc3b6cd25  johnDoe.dd
```

Figure 1, MD5 Hash test executed.

### 2.3.2 Physical Searching

Physical Searching is a method used by investigators to find obscured data more accurately on the drive. This is done by treating the drive as a single binary rather than a collection of executables. Doing so reveals deleted and hidden files more easily and allows for an investigator to have a more accurate and complete picture of the files on the drive.

Before proceeding, investigators gathered a plethora of information on the drive's contents. This includes the file composition as well as the partitions available.

### 2.3.2.1 Disk Analysis

Prior to investigating the contents of the drive, the investigators gathered information about the drive. Information such as the file types, the operating system, the size of the drive, as well as if the drive had any malware present.

The analyst was able to determine that the drive was operating on Windows XP with a hard drive that was at most 6GB. The drive consisted of 1949 images, 18 videos, 170 audio files, 1048 documents, 1062 exe files, as well as 4291 various other files. Clamscan revealed that there was no malware present on the drive.

```
cmp209@cmp209-virtual-machine:~/jd$ clamscan johnDoe.dd
/home/cmp209/jd/johnDoe.dd: OK

----- SCAN SUMMARY -----
Known viruses: 2039231
Engine version: 0.103.11
Scanned directories: 0
Scanned files: 1
Infected files: 0
Data scanned: 0.00 MB
Data read: 5495.77 MB (ratio 0.00:1)
Time: 19.944 sec (0 m 19 s)
Start Date: 2024:03:14 06:33:00
End Date: 2024:03:14 06:33:20
cmp209@cmp209-virtual-machine:~/jd$
```

Figure 2, Clamscan executed displaying no malware.

### 2.3.2.2 Autopsy

Autopsy is an open-source application used for digital forensics as a GUI for The Sleuth Kit, which is a digital forensic library containing several different tools allowing for a user to properly analyse disk images. The GUI gives the user an emulated file system allowing for seamless drive traversal. Several of the features Autopsy provides include file hashing, unpacking compressed files, file cataloguing, keyword indexing, and EXIF data extraction.

Utilizing the many features in Autopsy provided analysts a multitude of information for the investigation. The most valuable of the information discovered being the bird images within the disk. On top of this, there were four different emails between John Doe and a colleague referred to as Ben as well as an emailing list for bird identification. These emails are provided at the end of this document in Appendix D -Emails.

Using keyword searches and more thorough investigations revealed bird documents such as birdwatching guides. One of these guides was by a Pete Dunne, entitled "An Insider's Guide to Enjoying Your First Birding Field Trip", and described tips for when out looking for birds. Another relevant document was a pdf file of a Birding Guide for Porter County, the bibliography credited the document to Kenneth Brock and David Sibley. Lastly, a "Birdwatching in Thailand" document was found credited to one Antony Lynam describing different bird species one might come across in the Southeast Asian jungle. All documents will be provided in Appendix E – Documents.

### 2.3.2.3 File Carving

Using the command-line forensic tool Foremost the analysts were able to recover a variety of files which included several previously hidden files. The complex command below was used to rediscover this information, recursively running itself into directories depending on file type.

```
 1 cmp209 cmp209 4770 Mai 7 17:32 03447200.jpg  
cmp209@cmp209-virtual-machine:~/jd/output_Sat_Mar_9_19_50_25_2024/jpg$ open 05319231.jpg  
cmp209@cmp209-virtual-machine:~/jd/output_Sat_Mar_9_19_50_25_2024/jpg$ foremost -T -t all -i johnDoe.dd
```

Figure 3, The Foremost command

Using this tool provided a plethora of ornithological data relevant to the investigation at hand which was then provided to the authorities.

#### 2.3.2.4 *Images*

John Doe stands accused of unlawful possession of explicit avifauna imagery. The analysts prioritized locating image files within the drive, specifically those containing birds. Images included anything from the bird boxes to bird houses, bird babies to bird drawers, etc.

The images were found using a couple of different methods. The images that were found using Foremost, then using Metacam in the command line to see what metadata could be found. The other method was using Autopsy to tag any bird related images or images related to the case.

There were 126 bird related images found but when the duplicates were taken out that number was reduced to 95 bird related images. A total of 103 images were found with the EXIF data attached.

The images were split up into bird images and non-bird images that give evidence to the case there was 95 bird images and 36 non-bird images found in total that are documented in the appendixes with the file names and md5hash for each of them.

### **2.3.2.5 Communications**

During the autopsy of the disk, any communication outlets were looked for and documented. There were three emails that showed up in the search, [ben@example.org](mailto:ben@example.org), [idoe@example.com](mailto:idoe@example.com), and [mailinglist@birds.example.com](mailto:mailinglist@birds.example.com). The emails sent between these contained topics discussing how to identify birds as well as pictures of a multitude of bird species.

### 2.3.2.6 Recent documents

Looking through the Recent Documents revealed several different pieces of information. The most important of which being a USB drive (E:/) containing a subfolder entitled "birds". This folder included audio and non-image bird related content such as a book list.

### 2.3.3 Prefetch Analysis

Whenever a program is run on a computer for the first time, usually from a specific directory, a prefetch file will be made to speed up any uses in the future. This can then be read as a list of programs that have been executed on the machine which includes any non-standard executables that may have been custom made for the viewing or creation of ornithological material. These files are timestamped with the first and last times these programs were executed.

Copies of John Doe's prefetch files were made and then transferred to the analyst's computer. The analyst used Eric Zimmers tool PECmd to read and understand the most recent times these programs were executed.

### 2.3.4 Registry Examination

All computers have a registry, this is a database that stores various amounts of information such as system configuration, user profiles and preferences, software settings, permissions and access controls and details about hardware devices.

There are five hives otherwise known as root keys, these are named HKEY\_CURRENT\_USER (HKCU) HKEY\_USERS (KHU), HKEY\_CLASSES\_ROOT (HKCR), HKEY\_LOCAL\_MACHINE (HKLM) and HKEY\_CURRENT\_CONFIG (HKCC). The hives that are most relevant to the investigation are HKCU and HKLM.

There are then subkeys within these root keys, the most important being within HKLM, this contains SAM (security accounts manager), Software and System. Then within HKCU, a file named NTUSER.DAT can be found. All of these contain key information that can be used to gather information in an investigation.

SAM stores information on user logins. The software registry is filled with information on programs such as what is run on startup and installed in general. Then the system registry contains information about the hardware on the device such as USB devices, hard drives, and the last time the machine was turned off. Lastly, the NTUSER.DAT file contains information in relation to John Doe's account, especially his most recently used documents and executed programs.

### 2.3.5 Browser Analysis

Browser analysis can provide a wealth of information about the user's online activities. By examining the browser artifacts, it's possible to uncover a timeline of web data as there are dates and times attached to this information. The data can contain information such as websites visited, searches, downloaded files and bookmarks. This can reveal patterns and potential intent.

John Doe used both internet explorer and Mozilla Firefox. Although when further research was conducted it became apparent that internet explorer was just used to install Firefox. Therefore, the focus was all on the Firefox data.

### 2.3.6 Email Analysis

Email analysis is another important step of an investigation, it provides valuable insights into communication patterns, relationships, and activities of the suspect. This is done by examining email artifacts, such as sender and recipient details, timestamps, email content, attachments, and metadata can be gathered.

The email client Thunderbird which was downloaded as discussed above was the application he used to access his email account [j.doe@example.com](mailto:j.doe@example.com). There were many emails in which John Doe received attachments that are unequivocally ornithological.

### 2.3.7 Encrypted Archive

A file named birdpics.gpg was found to be encrypted by GNU Privacy Guard (GPG), therefore it had to be decrypted first before it can be accessed. Access to the key was found within secring.gpg and was

password protected as well so john the ripper was used, this then revealed the password “arran”. Using this the file was then decrypted and revealed 5 bird images. One of the images “WhiteThroatedSparrowInTree.jpg” was able to be decrypted but the others couldn’t be cracked. The photo is available at ([Appendix I, Encrypted Archive](#))

Name	Size	Type	Modified
E:\birds\birdpics\WhiteFaced...	181.3 kB	JPEG image	02 February 2005, 16:25
E:\birds\birdpics\WhiteFront...	188.9 kB	JPEG image	02 February 2005, 16:25
E:\birds\birdpics\WhiteThroa...	247.0 kB	JPEG image	02 February 2005, 16:25
E:\birds\birdpics\WhoopingC...	305.5 kB	JPEG image	02 February 2005, 16:25
E:\birds\birdpics\yellow-wag...	61.6 kB	JPEG image	02 February 2005, 16:25

## 2.4 ANALYSIS

### 2.4.1 Disk Analysis

The third-party application OSFMount.exe was used to analyze the true size of the disk. It was suspected that the disk had more content than the 2.93 GB size that was being displayed for drive E: to the investigators. Other tools at the beginning and throughout the investigation had shown that the true size of the disk was closer to 5.6 GB.

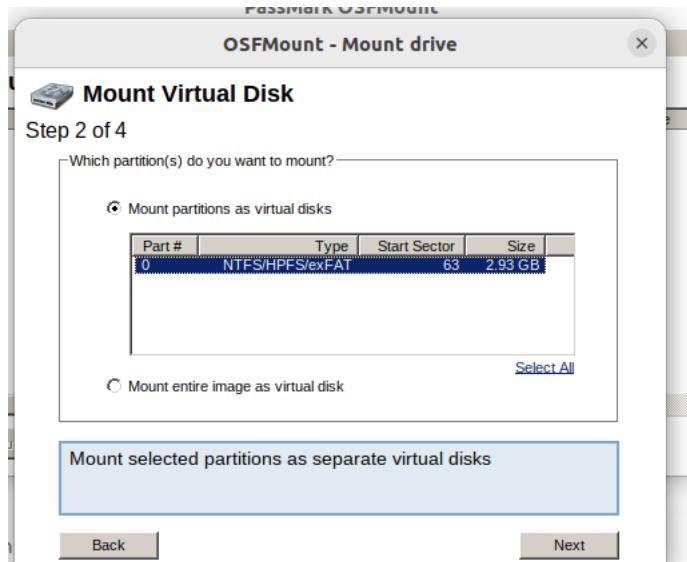


Figure 5. OSFMount displaying the E: drive size.

#### 2.4.2 Summary of Partition Table

During the investigation, there were suspicions that a hidden drive of data was present on the disk. To confirm this, the command-line tool mmls was used to locate all data partitions present, even those hidden at first glance. Looking through the partition table discovered 2 gigabytes worth of unallocated data. The investigators denoted that its size and block length number made it more than likely that there were hidden files inside this separate partition.

#### 2.4.3 Registry

Registry examination was carried out. The first detail that was found is the date and time of when the machine was last shut down. This was found within the system registry. Details of this can be found in Appendix I. Using the command chntpw -l Sam, this displayed all the users and their RID. This then allowed analysis into the SAM file where John Doe was the last user on the machine, this can be seen in Appendix G.

There were multiple devices connected to the suspect's computer, this can be found in Appendix I. The most relevant being the USB device mounted as the E drive as this is where the encrypted suspected bird pictures are stored.

Looking into the suspects NTUSER registry it can be found that in the RecentDocs which contains the most recently accessed files, many of the files detailed below that are ornithological were accessed most recently such as the bird audio file "aggressive\_song.wav" "and chicks2.jpg".

ComputerDescription	Hex viewer	int8: 97
ComputerDescription	0000 61 00 67 00 67 00 72 00 65 00 73 00 73 00 69 00 a.g.g.r.e.s.s.i. 0010 76 00 65 00 5f 00 73 00 6f 00 6e 00 67 00 2e 00 v.e.s.o.n.g... 0020 77 00 61 00 76 00 00 6c 00 32 00 00 00 00 00 w.a.v...l.2..... 0030 00 00 00 00 00 00 61 67 67 72 65 73 73 69 76 65 .....aggressive 0040 5f 73 6f 6e 67 2e 77 61 76 2e 6c 6e 6b 00 46 00 _song.wav.lnk.F. 0050 03 00 04 00 ef be 00 00 00 00 00 00 00 14 00 ..... 0060 00 00 61 00 67 00 67 00 72 00 65 00 73 00 73 00 .a.g.g.r.e.s.s. 0070 69 00 76 00 65 00 5f 00 73 00 6f 00 6e 00 67 00 i.v.e.s.o.n.g. 0080 2e 00 77 00 61 00 76 00 2e 00 6c 00 6e 00 6b 00 .w.a.v...l.n.k. 0090 00 00 26 00 00 00 ..&...	uint8: 97
Desktop		uint8: 97
Downloadable		int16: 97
FileExts		uint16: 97
HideMyComputerIC		int32: 6750305
MenuOrder		uint32: 6750305
MountPoints2		unixtime: 1970/03/20 03:05:05
MyComputer		int64: 32088589733396577
NewShortcutHandler		uint64: 32088589733396577
PropSummary		filetime64: 1974/11/22 02:39:26
RecentDocs		
.doc		
.gif		
.htm		
.html		
INI		

The programs installed on the machine were analyzed by accessing the Software registry. This first revealed the software used to encrypt the zip file of ornithological material. There was also Mozilla thunderbird, which was used for sending emails and Mozilla Firefox, these were both used to access ornithological material. There are 4 programs that run on startup but none of them are suspicious, it contained anti-virus software and an error reporting tool.

#### 2.4.4 Prefetch Analysis

By viewing John Doe's prefetch files there are several programs that have been used for ornithological content or to try and remove any evidence from his hard drive.

For example, Regedit is a tool that is used to edit registry keys, by finding a prefetch file the analysts know that this has been run at some point, but it is not clear if or how it has made any changes to the registry as well as when this could have been done.

By using Eric Zimmerman tool PECmd it was made possible to view the prefetch files and see more information from them things like when the exe was made or modified on and the directories that were referenced images of these are available in the Appendix ([Appendix H, Prefetch PECmd Images](#))

There has also been an .exe that has several entries which means it was run from many different places on the machine. Tx\_birds.exe was found to be a Windows executable file which when run with an

emulator like wine it created a screensaver containing 9 pictures of birds ([Appendix H, Prefetch Screensaver Images](#))

The analysts also found that GPG has been run and was used to encrypt the zip file of birds detailed earlier.

#### 2.4.5 Browsing History

The local internet explorer cache and Mozilla Firefox cache were both investigated by the analyst, this highlighted a plethora of data which was of ornithological nature. These files were found at the following paths:

"C:/Documents and Settings/johndoe/Local Settings/History/History.IE5/index.dat"

"C:/ Documents and Settings/johndoe/Application Data/Mozilla/Firefox/Profiles/w4nf3obl.default"

Pasco was used to parse the information of the index.dat file and display the results in a readable format in the form of a csv file.

The internet explorer history showed a download for Mozilla Firefox and Mozilla thunderbird.

([7.1.14.1](#),[7.1.14.2](#))

This then led to Firefox analysis. To view the files in a readable format a tool called MZHistoryView was used.

The same day Thunderbird is downloaded again. Two days later there was a search for "birds" this then lead to the site "<http://www.pbs.org/lifeofbirds/>" then "<http://www.pbs.org/lifeofbirds/songs/index.html>". Utilizing the wayback machine this showed that at that time it was a page where it was possible to download bird audio files and listen to them and it also contained information about birds. ([7.1.14.3](#))

Google is then used again, and this is followed by a search in amazon for "birds" in the books category. Two books were visited, "Garden Birds Collins Gem S." and "The Secret Lives of Garden Birds" ([7.1.14.4](#))

Another google search is made for "bird wallpaper" following this the site "[http://www.naturewallpaper.net/birds\\_L.html](http://www.naturewallpaper.net/birds_L.html)" was visited, while on the site two images were viewed, image 4 and image 21. Proceeding this the suspect clicks on an ad to buy a bald eagle and then views a product "Bird Watcher's Paradise from Choices Direct". ([7.1.14.5](#))

Following on from this a google search "bird stories" was carried out. The suspect then visits a website "<http://birding.about.com/od/storie1/The>" suspect then visits five pages within this website. "Wings of Terror - avian humor article for people interesting in birdwatching and others interested in birds", "Specs for Building Birdhouses and for use in Bird House Plans", "How to Build Bird Houses and Nest Boxes", " Birding and Birdwatching - Build a Bluebird Nest Box for Wild Birds" and finally "Birding and Birdwatching - Painting or Staining Bird Houses and Feeders". ([7.1.14.6](#))

The site <http://www.haiths.com/> is then browsed to, this is a shop where you can purchase bird food, it also has some guides on bird feeding. ([7.1.14.7](#))

After this, the site <http://www.imdb.com> was traversed to, which contained the movie "The Birds 1963" by Alfred Hitchcock. The suspect then watched the trailer. ([7.1.14.8](#))

After a brief intermission in terms of bird related evidence, [www.pbs.org](http://www.pbs.org) was then returned to view two bird audio files. (7.1.14.9)

A google search “windows gnupg” was then carried out, <http://www.gnupg.org/download/> was then accessed. This is extremely important as this is the name of the software used to encrypt files found earlier on in the report. The site <http://www.stud.uni-hannover.de/~twoaday/winpt.html> was then accessed, this is a page for downloading a front end for GnuPG. (7.1.14.10,7.1.14.11)

The suspect then carries out a google search for “bird mating calls”, the site [http://whyfiles.org/shorties/104chick\\_sex/](http://whyfiles.org/shorties/104chick_sex/) was then accessed. Within this site are karaoke songs about birds mating. On this site is the [http://whyfiles.org/shorties/104chick\\_sex/](http://whyfiles.org/shorties/104chick_sex/) which was downloaded and is the audio file found during the investigation. (7.1.14.12, 7.1.14.13,7.1.14.14)

Following this is a google images search for “young chicks” was made, this then led to the suspect accessing a site [http://freespace.virgin.net/cobber.budgies/stories/scottie\\_a.html](http://freespace.virgin.net/cobber.budgies/stories/scottie_a.html) this contained information about young chicks and also two images which were downloaded “babyscot\_2weeks1.jpg” and “babyscot\_vyoung.jpg”. (7.1.14.15,7.1.14.16)

Ornithological files were then accessed and downloaded from multiple sites. “177.jpg” from “insaneanimals.com”, “ostbk2b2.htm” from “cvm.okstate.edu”. The site “people.cornell.edu” contained ornithological images and shows the research of birds and the image “chicks2.jpg” was downloaded from this site. (7.1.14.17)

Finally, the last piece of information contained within the history.dat is a search for “bird screensavers”. This then led to the site “traveltex.com” being entered, a file named “birds.zip” is then downloaded. (7.1.14.18)

The evidence provided shows a consistent behavior of searching and downloading images, files and information of ornithological nature. It is also shown that it is the user that has carried out this due to the dates and times attached. Due to this it shows that it wasn't accidental, and the suspect knew what they were doing.

#### 2.4.6 Bookmarked History

Knowing that the browser used was Firefox, it was attempted to find the bookmarks within the application data. The path was C:/Documents and Settings/johndoe/Application Data/Mozilla/Firefox/Profiles/w4nf3obl.default/, within this contained “bookmarks.html” and “bookmarks.bak” which is a backup. Inside these files, three links of relevance were found, [http://www.naturewallpaper.net/birds\\_L.html](http://www.naturewallpaper.net/birds_L.html), <http://birding.about.com/library/blalphatypeofbird.htm> and [http://whyfiles.org/shorties/104chick\\_sex/](http://whyfiles.org/shorties/104chick_sex/).

16) HREF="http://www.naturewallpaper.net/birds\_L.html" ADD\_DATE="1107354119" ID="rdf:#\$1CbOg3"  
17) HREF="http://birding.about.com/library/blalphatypeofbird.htm" ADD\_DATE="1107354246" LAST\_CHARSET="ISO-8859-1" ID="rdf:#\$2CbOg3"  
18) HREF="http://whyfiles.org/shorties/104chick\_sex/" ADD\_DATE="1107439776" LAST\_CHARSET="ISO-8859-1" ID="rdf:#\$E5Ufc1"

These also had the dates added next to them as shown above, although it was in another format which was found out to be epoch time, this was then converted to UTC time. This then is extremely useful as these links were put into the wayback machine and the closest date to the date of addition was attempted to be found. These can be seen in ([Bookmarked Pages](#)).

#### 2.4.7 Downloaded Files

Firefox has saved within it a "downloads.rdf" file with the complete downloaded file history. This is user profile specific and searching for it within John Doe's personal profile reveals the files downloaded, where they are downloaded from as well as the date and time of the start and end of the download.

The following files are bird-adjacent downloaded files from that profile:

On the 9th of February 2005 at 11:28:00 GMT, "birds.zip" was downloaded from "<http://www.traveltex.com/downloads/screensavers/>" to "C:\Documents and Settings\johndoe\My Documents\" and was listed as taking up 1028KB of storage. This file cannot be found the disk anymore; however, it is possible that the file has been unzipped and moved to another location or drive.

On the 3rd of February 2005 at 15:00:27 GMT, "babyscot\_2weeks1.jpg" was downloaded from "<http://freespace.virgin.net/cobber.budgies/images/>" to "C:\Documents and Settings\johndoe\My Documents\My Pictures\" and was listed as taking up 33KB of storage. This file is still on the device and contains a handful of young birds.

On the 3rd of February 2005 at 15:04:48 GMT, "birdtrans2.jpg" was downloaded from "<http://people.cornell.edu/pages/sah67/>" to "C:\Documents and Settings\johndoe\Desktop\" and was listed as taking up 58KB of storage. The file contains an image of a bird held in the man's hand whilst it spreads its wings.

On the 2nd of February 2005 at 15:12:09 GMT, "dawn.ram" was downloaded from "<http://www.pbs.org/lifeofbirds/songs/>" to "C:\DOCUME~1\JOHNDOE\LOCALS~1\TEMP\" and was listed as taking up 1KB of storage. The file is still located on the disk; however, the byte size has changed. The file contains a link to an audio file "dawn.rmd" found on the website "audio.pbs.org/songs/". The soundbite is a snippet of the dawn bird's song.

On the 3rd of February 2005 at 15:01:39 GMT, "177.jpg" was downloaded from "<http://www.insaneanimals.com/items/>" to "C:\Documents and Settings\johndoe\My Docuemnts\My Pictures\" and was listed as taking up 9KB of storage. This file currently still exists on the hard drive and contains a singular chick next to an unhatched egg.

On the 3rd of February 2005 at 15:00:19 GMT, "babyscot\_vyoung.jpg" was downloaded from "<http://freespace.virgin.net/cobber.budgies/images/>" to "C:\Documents and Settings\johndoe\My Documents\My Pictures\" and was listed as taking up 38KB of storage. This file currently still exists as the same sized file on the device depicting three newly hatched birds next to three more eggs.

On the 3rd of February 2005 at 12:23:00 GMT, "aggressive\_song.wav" was downloaded from "[http://whyfiles.org/shorties/104chick\\_sex/images/](http://whyfiles.org/shorties/104chick_sex/images/)" to "E:\birds\audio\" a removable storage disk. The device this is downloaded to is not currently available for analysis, but researching the download link reveals the file is the same size. It is likely to be the same file still, which is an audio clip of singing birds.

On the 3rd of February 2005 at 15:05:44 GMT, "newbies2.jpg" was downloaded from "<http://people.cornell.edu/pages/sah67/>" to "C:\Documents and Settings\johndoe\My Documents\" and was listed as taking up 54KB of storage. The file exists on the device still and contains a finger touching a newly hatched bird.

On the 3rd of February 2005 at 15:05:03 GMT, "chicks2.jpg" was downloaded from "<http://people.cornell.edu/pages/sah67/>" to "C:\Documents and Settings\johndoe\My Documents\My Pictures\" and was listed as taking up 38KB of storage. The device still contains the same sized file which shows and a handful of freshly hatched chicks sleeping upon a nest.

The downloads all happened around two days sporadically indicating that they were intentionally downloaded by the user and not from someone else by mistake. There is no indication that there was an attack on the system.

#### 2.4.8 Audio

Out of the 170 audio files that were found only 1 was identified as being of relevance to this case which was an audio file called "aggressive\_song.wav" which was stored locally and was an 8 second clip of birds chirping in a very high-pitched manner.

#### 2.4.9 Emails

The analyst gained access to several emails received by John Doe which was made possible by gaining access to the local cache of the mailbox that was used "Thunderbird".

This cache was found at "C:\Documents and Settings\johndoe\Application Data\Thunderbird\Profiles\8jicrt8v.default". In the file named "7947277.s" the analyst was able to find that the email address used was [jdoe@example.com](mailto:jdoe@example.com) with the password also being stored locally in Base64, "YXJyYW4=" which when decoded is "arran".

On the 16<sup>th</sup> of October 2004 at 17:51:39 GMT, the suspect received an email from a mailing list "Bird Fanciers" with the subject line "How to identify birds" which includes a paragraph on how to identify birds which can be seen in Appendix B – Emails ([Email 1](#) ).

On the 17<sup>th</sup> of November 2004 at 18:51:39 GMT, the suspect received an email from Ben Forbes ([ben@example.org](mailto:ben@example.org)) with the subject line "good pics". The email also included Ben saying that he thought John would like these which is referring to 3 images that were attached.

These images (7EYBTELF1KAN.jpg, cute\_penguin.jpg and IMG\_3937\_filtered.jpg) are of 2 parrots in a cage, a penguin made from balloons and a bluebird sitting in a tree.

This email also implicates Ben Forbes, an acquaintance of John Doe, by sharing these bird-related images. This email can be viewed in Appendix B – Emails ([Email 2](#) ) and the images in Appendix A – Images (Bird Images 40,43,41) .

When using Autopsy, it was found that a duplicate of this email, which only had the 7EYBTELF1KAN.jpg file attached.

On the 17<sup>th</sup> of November 2004 at 18:51:39 , the suspect received another email from Ben Forbes ([ben@example.org](mailto:ben@example.org)) with the subject line "expensive birds" , which describes a bird being eaten. This email can be viewed at Appendix B – Emails([Email 3](#)).

On the 8<sup>th</sup> of February 2005 at 14:35:29 GMT , the suspect received another email from Ben Forbes ([ben@example.org](mailto:ben@example.org)), with the subject line "some more good ones" in this email Ben thanks John for the "pics you sent me" which indicates that John has disturbed pictures to Ben . In return for those Ben has attached 5 pictures of birds in his email to John. These include an image of a bird sitting in some water

(gawall8.jpg), a bird feeding 3 baby birds (glfs-storm-birds.jpg), 3 brightly colored birds are sitting in some grass(colorful-birds.jpg), what looks like a seagull flying off after taking food from a gloved hand (BC7 feeding the birds.jpg) and the same image that was received in the first email (IMG\_3937\_filtered.jpg). This email can be viewed at Appendix B – Emails ([Email 4](#)) and images at Appendix A – Images (Bird Images 53,48,51,50,41).

#### 2.4.10 Documents

"Documents" refer to files identified by their metadata or file extensions, categorizing them into one of five types, though, in this specific case, only four are present. These types include HTML, Office, PDF, Plain Text, and Rich Text, although Rich Text documents are absent in this dataset. All files obtained have been submitted to the authorities as evidence in this case.

The analyst first looked at the HTML documents most of these represent results for the browser history which will be analysed in another section of this report. Some examples of these are HTML documents that appear to show search engine results for the terms "bird screensavers", "bird mating calls" and "birds".

We also have locally saved HTML files that represent some other browsing history on Amazon for a few bird-related books (Collins Field Guide: Bird Songs, Calls of Britain Garden birds by Stephen Moss, Birds Without Wings by Louis De Bernieres, and Calls of Britain and Northern Europe by Geoff Sample).

These files were found by file carving within the main partition, there were also 3 other html files present in the "Documents and Settings" directory. These files are ([hobbies\\_birding.htm](#), [hobbies\\_birding\\_002.htm](#) and [hobbies\\_birding\\_003.htm](#)) these can be seen in Appendix C – Documents.

The analyst moved onto the office files. There were only 3 examples of these kind of files that are of note and 2 of them were duplicates. There is a "guide.doc" which is also known as [f0005504 An Insiders Guide to Enjoying Your First Birding Field Trip.doc](#), can be seen in Appendix C – Documents and the "[birdwatching.doc](#)". These guides are of different kinds of birdwatching, the former is a guide to "enjoying your first birding field trip" and the other is a guide to birdwatching in Thailand.

After the office files were analyzed, it was time to move on to the PDFs, that were not password protected. There was 3 PDF's that were of Note in this case and these were:

- A single page piece of promotional material for a book called "Birding sites around Perth" by Robin van Delft – Appendix C – Documents ([BIRDING SITES](#))
- A newsletter from the University of California's Botanical Garden, who's main

theme and headline that edition was "Birds at the UCBG" – Appendix C – Documents ([University of California Botanical garden newsletter \(f0273688\\_newsletter\\_Win\\_201.q.pdf\)](#))

)

- The Porter County Birding Guide, a guide to birds around Porter County in Michigan, USA – Appendix C – Documents (the [porter](#) County Birding Guide (f0327896.pdf))

The last documents to analyses are the text files, there is [f0095922.txt](#) (which is identical to the content from this email from Ben Forbes), [Nestboxtips.txt](#) (Appendix C – Documents) and some miscellaneous web cookies was the only other text files of note.

The file [Nestboxtips.txt](#) is a series of tips written by an anonymous author on how best to prepare and maintain boxes in which birds will nest in. The [f0095992.txt](#) is a story which is told in the format of a joke, of a young girl who purchases a bird for her mother in which she ate believing it to be exotic foodstuff.

And the miscellaneous cookies are evidence that John Doe has visited some bird-related websites, which is discussed elsewhere in this report.

#### 2.4.11 Images

There are 126 bird related images found which included duplicates over both partitions which takes the number of images down to 95 images of bird related content, which can be seen in [Appendix B -Bird Images](#). Some of these images were photographed in their natural habitat but most of the birds were in some form of captivity either the birds have been captured to be tagged, chicks being fed or sleeping and other images of them being handled and interfered with by an individual's hands.

Regarding the ornithological images in question, there were 3 methods of acquisition that has been used in this case and they are:

- Images taken with the camera that was recovered from the suspect's house, a Canon Powershot SD100
- Images that were sent to the email address [jdoe@example.com](#)
- And images that were acquired through other, unproven means.

The first method of acquisition can be determined through either using Autopsy or Metacam in the command line to pull the EXIF data from the images automatically.

In total there were 101 images on the recovered drive which were taken by the camera in question of which 29 were determined to be illicit. The 3 remaining images of which the EXIF metadata that was found are for 2 different cameras', there were 2 images taken with a Canon EOS-1DS and the other one was a SONY CYBERSHOT. These images were acquired via email to the suspect.

As shown in Appendix D, there were 9 attachments in total, 1 was corrupted to the point it was unreadable. Of the remaining attachments 7 were images of birds themselves and 1 was of what appears to be a penguin balloon animal, which was classified as bird related by the analysts.

The remaining images that were recovered can be assumed they were acquired by John Doe (or someone who had access to the PC) through other means, presumably through downloading from internet-based sources.

There were also images that were recovered from the drive that were not illicit images in nature. These images do not have and are not illicit ornithological material they do appear to portray a group of

individuals which can be presumed to be John Doe and his associates , which is based on the fact that the majority of the images were taken with the previously mentioned Canon Powershot SD100, in what looks to be engaging in practices that could be referred to as looking for birds.

In Appendix C – Non-Bird Images, in Images 1,18,24 and 30 you can clearly see individuals setting up various birdhouses in different locations.

All these images were taken with this camera during the period of 09-06-2004 to the 27-06-2004. Due to the proximity of the dates being so close to each other and that there are many of the individuals appear in multiple images, it is the opinion of the analysts that this was an extended group outing/a series of outings or a group holiday. Currently the analysts have passed on these images to the relevant authorities for them to identify the people in these images out with John Doe himself.

## **2.5 TIMELINE RECONSTRUCTION**

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### **2.5.1 13/06/2004 – 27/06/2004**

Over this time 29 pictures of an ornithological nature are taken with the “Canon Powershot SD100”

### **2.5.2 16/10/2004**

17:51:39 – Email sent to John Doe from Bird Fanciers [mailinglist.birds@example.com](mailto:mailinglist.birds@example.com) about identifying birds

### **2.5.3 17/11/2004**

18:51:39 – Email from [ben@example.org](mailto:ben@example.org) to John Doe with 3 attachments

18:51:39 – Duplicate email from [ben@example.org](mailto:ben@example.org) to John Doe with only 1 attachment

18:51:39 – Third email sent from [ben@example.org](mailto:ben@example.org) to John Doe with a story about a bird being eaten

### **2.5.4 02/02/2005**

14:11:46- google search “birds”

14:15:42- google search “bird wallpaper”

14:22:25- google search “bird stories”

15:04:48- dawn.ram downloaded

15:57:40- google search “windows gnupg”

15:57:51- download of GnuPG

16:25:10 – “WhiteThroatedSparrowInTree.jpg“

17:28:39- “[http://www.naturewallpaper.net/birds\\_L.html](http://www.naturewallpaper.net/birds_L.html)” is added to bookmarks on Firefox

17:30:46- “<http://birding.about.com/library/blalphatypeofbird.htm>” is added to bookmarks on Firefox

17:42:56- “[http://whyfiles.org/shorties/104chick\\_sex/](http://whyfiles.org/shorties/104chick_sex/)” is added to bookmarks on Firefox

**2.5.5 03/02/2005**

12:21:40- google search “bird mating calls”

12:23:00- aggressive\_song.wav downloaded

14:59:40- google images search “young chicks”

15:00:19- babyscot\_vyoung.jpg downloaded

15:00:27- babyscot\_2weeks1.jpg downloaded

15:01:39- 177.jpg downloaded

15:05:03- chicks2.jpg downloaded

15:05:44- newbies2.jpg downloaded

**2.5.6 08/02/2005**

14:35:29 – Email from [ben@example.org](mailto:ben@example.org) to John Doe with the subject line some more good ones and 5 attachments

**2.5.7 09/02/2005**

11:27:00- google search “bird screensavers”

11:28:00- birds.zip downloaded

17:10:01- last shutdown of machine

## **2.6 PRODUCTION LIST AND ASSOCIATED DESCRIPTION**

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In this section of the report, it will outline the digital artifacts and the documents that were produced because of the forensic examination. Each item that is listed below is also accompanied by a brief description of its nature and the reason for its creation. These are integral to support the findings and conclusions of the forensic analysis.

### **Item 1: Digital Forensic Analysis Report**

**Description:** Is a comprehensive report detailing the forensic analysis conducted on the suspects digital devices. This document will include a summary of the methodologies used, findings and any evidence of malicious intent.

**Purpose:** This is produced to provide a detailed account of the forensic examination process, findings, and conclusions. This will serve as the primary document outlining the evidence gathered.

### **Item 2: Forensic Disk Images**

**Description:** Taking an exact copy bit-for-bit copies of the hard drives from the suspects devices, created using forensic imaging tools. These images are stored as .dd files and are accompanied by their hash values to verify integrity.

**Purpose:** These images are made to preserve the original state of the devices at the time of examination. They provide a reliable basis for forensic analysis and allow the reproduction of findings.

### **Item 3: Email Analysis**

**Description:** A collection of any relevant emails from the suspects email accounts, along with an analysis of their content, senders, and timestamps. These will be produced in a section in the report and the actual email files will be organized in a searchable format.

**Purpose:** Extracted and analyzed to uncover any evidence of communications of a suspicious nature which contributes to the case.

### **Item 4: Browser Analysis**

**Description:** A collection of any relevant browser content such as history, bookmarked pages cookies. These will be produced in a section in the report and any evidence will be organized in a searchable format.

**Purpose:** Extracted and analyzed to uncover any browser content that is related to the case or suspicious in nature.

### **Item 5: Document Analysis**

**Description:** Examine any digital documents that were recovered during the forensic investigation which can include word files, PDFs, and spreadsheets. The analysis will focus on any metadata, content, and any embedded objects to identify any relevant information tied to the case timeline or the suspect.

**Purpose:** This is produced to uncover any evidence of document creation, modification or access that may indicate unauthorized activity, reveal communications to the case or corroborate timelines.

#### **Item 6: Downloaded Files Analysis**

**Description:** Analysis any files downloaded to the suspect's device which is indicated from the browser history and the file system metadata. This will include examining file types, sources timestamps and the content to determine if it is relevant to the investigation.

**Purpose:** In this case this is aimed at the transfer of sensitive information, this can also highlight the suspect's intent and actions leading up to or following the incident which is under investigation.

#### **Item 7: Disk Analysis**

**Description:** This is an examination of physical and logical storage devices, this will employ techniques to recover deleted, hidden, or encrypted files. This includes analysis of file systems, partition structures and unallocated space for evidence of any tampering or unauthorized data exfiltration.

**Purpose:** This is done to reconstruct user activities, recover lost or deleted evidence and identify any attempts to conceal, alter or destroy data.

#### **Item 8: Registry Analysis**

**Description:** This is a detailed examination of the Windows Registry on the system that is under investigation. This will focus on extracting information about the installed applications, user activity, system configurations and any AutoStart programs to build a comprehensive activity timeline.

**Purpose:** This provides insight into the user's behaviors and system changes. This is crucial for reconstructing events.

#### **Item 9: Images Analysis**

**Description:** Review and categorize any image files found across digital media, using both automated tools and manual inspection. Analysis will include metadata examination, content review and where applicable compared against known image databases.

**Purpose:** This is done to identify any illicit material or gather evidence that supports the case through visual content or metadata timelines.

#### **Item 9: Audio Analysis**

**Description:** Listen to any audio files, which can include voicemails, recordings, and digital communications. This section will focus on content review, metadata analysis and audio enhancements to identify speakers, understand contexts and correlate timelines.

**Purpose:** This is essential for uncovering any evidence within communications, establishing a timeline of events, and providing context to other digital findings. This can also reveal information about the location, date and time of the recordings which can contribute to case development.

#### **Item 10: Technical Logs**

**Description:** The technical logs encompass a comprehensive collection of logs which is derived from both the forensic examination tools and the devices that are being analyzed. This can include logs that document the processes and methodologies applied during the digital forensic analysis such as data acquisition, evidence analysis, and artifact recovery. Also, system and application logs from examined devices have been reviewed to corroborate timelines and findings.

**Purpose:** The main goal of including these technical logs is to provide a foundation for forensic analysis which ensures that an auditable trail substantiates the examinations integrity and findings. These logs also serve as a crucial point for validating the forensic processes used and the conclusion that was drawn from the examination. They also assist in establishing the reliability of forensic investigation.

### **3 CONCLUSIONS**

The digital forensic investigation conducted by the Digital Forensic Unit of 3ensic in collaboration with the University of Abertay and Police Scotland, has revealed compelling evidence regarding Mr. John Doe's involvement in the possession and distribution of illicit bird-related imagery and other forms of ornithological misconduct.

From analyzing the browsing data found on the machine John Doe has intentionally accessed various websites containing ornithological material which includes information, images, and sounds. The information and data accessed was then downloaded and stored.

John Doe was in contact with a person named Ben Forbes, this was using email, specifically Mozilla Thunderbird. These communications involved Ben sending illicit images to John, it is also suspected John sent images to Ben as well.

It is suspected John also participated in some sort of holiday where potential bird-related activity was taken out with a group of what seems to be friends or associates. This is due to the photos being taken on the camera Canon Powershot SD100 which was previously linked to Johns.

Overall, John was in possession of 100 images of ornithological nature, the content of these images' ranges from birds out in the wild to birds being handled and tagged. These images were gathered by John in a plethora of ways.

To cover up some of these illegal activities John attempted to hide data by making use of several different techniques. One way was by creating a separate partition on his drive that was hidden and unable to view by just using the computer in a standard manner. A USB drive was also discovered during the registry examination, both contained images of ornithological nature. He also made use of a program named GNU Privacy Guard to encrypt illegal content so that it wouldn't be possible to view with a decryption key, but this was recovered, and the images were able to view.

In conclusion, Mr. John Doe was in possession of a large collection of illegal bird images along with substantial evidence of intent that has been obtained through various means. It is therefore the opinion of the analysts that Mr. John Doe is accused of obtaining, possessing, distributing, and creating illegal ornithological material.

## 4 CONTRIBUTIONS

### KIERAN BISSETT

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- [Description of Crime](#)
- [Analysis Methodology – Registry Examination](#)
- [Analysis Methodology - Browser Analysis](#)
- [Analysis Methodology - Email Analysis](#)
- [Analysis Methodology - Encrypted Archive](#)
- [Analysis – Registry](#)
- [Analysis –Browsing History](#)
- [Analysis –Bookmarked Pages](#)
- [Conclusion](#)
- [Timeline Reconstruction](#)

### ANNIE PLACE

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- [Executive Summary](#)
- [Analysis Methodology – Disk Imaging](#)
- [Analysis Methodology - Physical searching: Disk Analysis](#)
- [Analysis Methodology - Physical searching: Autopsy](#)
- [Analysis Methodology - Physical searching: File Carving](#)
- [Analysis Methodology - Physical searching: Images](#)
- [Analysis Methodology - Physical searching: Communications](#)
- [Analysis Methodology - Physical searching: Recent Documents](#)
- [Analysis – Disk Analysis](#)
- [Analysis - Summary of the Partition Table](#)
- [Analysis – Downloaded Files](#)
- [Timeline Reconstruction](#)

### SNOW WHITE

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- [Job Description and Instructions](#)
- [Description of Recovered/Examined Items](#)
- [Equipment Required for Court Proceedings](#)
- [Analysis Methodology – Prefetch](#)
- [Analysis – Prefetch](#)
- [Analysis - Audio Files](#)
- [Analysis - Emails,](#)
- [Analysis - Documents](#)

- [Analysis - Images](#)
- [Timeline Reconstruction](#)

# **5 EQUIPMENT REQUIRED FOR COURT PROCEEDINGS**

For the findings of this report to be presented to the court, the following equipment is required:

## **Hardware:**

- Computer that has internet access, which can run various tools.
- A display device which is of adequate size which has an HDMI port (this can be a monitor, projector, or television.)
- HDMI Cable
- Any relevant power cables.
- The image of the John Doe drive
- A keyboard
- And a mouse.

## **Software:**

- A Linux-based operating system (the analysts used Debian-based operating systems such as Ubuntu or Kali Linux for the case.)
- Microsoft Windows Operating System
- Autopsy/Sleuth Kit
- Md5 hash command line feature
- Foremost
- Metacam
- Forensic Registry Editor (FRED)
- OSFMount
- Eric Zimmersmans PECmd

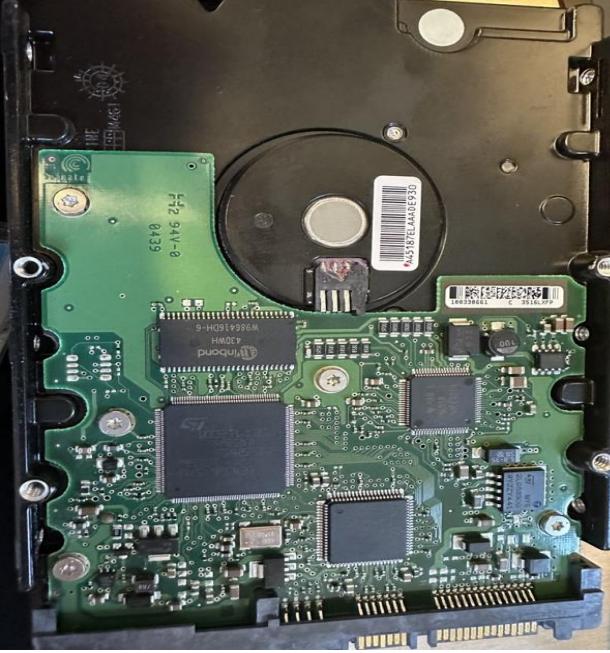
## 6 GLOSSARY

- **Directories** – another word for a folder
- **EXIF** – this is the Exchangeable Image File Format, this is the standard that specifies the information in image files like the camera make and model, location of where the image was taken and date and time.
- **Encryption** – this is converting readable data into unreadable data. The way to reverse this is to decrypt the data. There is a key which is a random string of characters specifically for converting encrypted data to unencrypted and vice versa.
- **GB** – GB stands for Gigabyte, which is a unit of digital information equal to 1,073,741,824 bytes. It's commonly used to measure the storage capacity of computer systems, such as hard drives, USB flash drives, and memory cards.
- **HDD** – Hard Disk Drive is a data storage device used in computers to permanently store and retrieve digital information.
- **Hash** – A hash is a fixed-size alphanumeric string generated by a mathematical function called a hash function. It represents the unique fingerprint of a piece of data, such as a file or message. Hashing is commonly used in cryptography and data integrity verification, as even a small change in the input data results in a significantly different hash value.
- **KB** – KB stands for Kilobyte, which is a unit of digital information equal to 1,024 bytes. It's commonly used to measure the size of files, data storage, and computer memory.
- **MD5** – MD5, short for Message Digest Algorithm 5, is a widely used cryptographic hash function that produces a 128-bit (16-byte) hash value. It's commonly used for verifying data integrity and detecting unauthorized changes to digital assets.
- **Metadata** – Metadata is details such as the title, author, date created, file size, and format of a document or file. Metadata helps organize, manage, and understand the characteristics and context of data, making it easier to search for, retrieve, and use.
- **NTFS/exFAT** – NTFS (New Technology File System) and exFAT (Extended File Allocation Table) are both file systems used in computer operating systems.
- **PDF** – It is a file format developed by Adobe that preserves the layout and formatting of documents, regardless of the software, hardware, or operating system used to view or print them. PDF files can contain text, images, graphics, and interactive elements, making them widely used for sharing documents electronically while maintaining their original appearance.
- **Partition** – is a logical division or section of a hard drive or storage device that appears as a separate entity to the operating system. Each partition typically has its own file system and directory structure.
- **Ubuntu** – Ubuntu is a popular open-source Linux-based operating system distribution.
- **USB** – It is a widely used standard for connecting peripherals to computers and other devices.



## 7 APPENDICES

### APPENDIX A – HDD IMAGES

Number	Image
1.	
2.	

## **APPENDIX B – BIRD IMAGES**

---

NO.	Image	Name on Disk
1.		foo33912. jpg md5hash: 880b9baf bdf139aaf b30fb2ec df373d7
2.		f0310480. jpg md5hash: 2ebf36f3124138f5841 12ddc07e5118b
3.		f0033928. jpg md5hash: c8556706 fc11c2a71 7f49ee20 c1e3292

4.



j0099150.  
jpg  
md5hash:  
12ba6ecbb5eda27c94f  
aa20b1264927a

5.



BaldEagle7oClock.jpg  
md5hash:  
7c3be8176820e88dcb  
1f89f6d2ddbab5

6.



CrouchingKokao.jpg

md5hash:  
fa463d5035f0ed111ac  
59c7f8856d404

7.



brd\_WoodDuck.jpg

md5hash:  
296531879159ce7799  
9f1c8af6d1e92a

8.		GreatEgretOverflyingRoseateSpoonbills.jpg md5hash: ca239de832cf2a1f6084a6939ee3d405
9.		Brolga.jpg md5hash: e44460b1be9072794611dbdd64d319c9
10.		BrushTurkeyPerching.jpg md5hash: 55bd5a13fd9663b481bce7f066cbb32c

**11.**



CanadaGoose.jpg  
md5hash:  
b7a84aa1ed0763fbef  
8d52b386c3d13e

**12.**



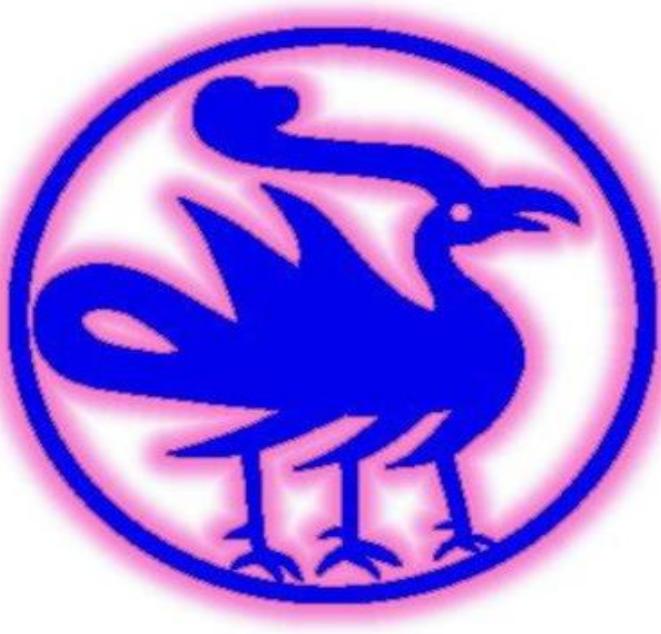
CanadaGooseWashing  
.jpg md5hash:  
7cace0aee77031856c1  
dc628b4c0c826

**13.**



ChesnutMandibledToucan.jpg md5hash:  
db5480ccb1dbbad7ad  
245629c0fa80e0

**14.**



J0099145.jpg  
Md5hash:  
68532e607c4a9694fa8  
5fc0c1e384124

**15.**



f0045880jpg  
md5hash:  
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16.



f0345344.jpg  
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78580ca76a1ec

17.



J0099147.jpg  
md5hash:  
291217b4d93fc85ab4  
8d7440acd4037b

**18.**



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65232dc8e9a707

**19.**



f0345656.jpg  
md5hash:  
a47d625cba6895455d  
099442bad55a3c

20.



J0099148.jpg  
md5hash:  
8ca2b8ec2aba086432  
5e9fe22732e4ca

**21.**



f0345832.jpg  
md5hash:  
5b3fa4e2e40a5b50e7  
563612725e19ea

**22.**



J0099152.jpg  
md5hash:  
b350d7e37bfe3d050d  
6fe82c9430c1ec

**23.**



AlmondMarshGreatBl  
ueHeronStalling.jpg  
md5hash:  
ed2b7f661974455399f  
9d083f01c19fe

**24.**



AmericanAvocetWinterPlumage.jpg  
md5hash:  
7addf538b2781a0d44d2ef0d4649e680

**25.**



AmericanWhitePelicansCircling.jpg  
md5hash:  
9e637c4b39b94f2eb72a8ebc81684652

**26.**



f0056920.jpg  
md5hash:  
9e43274bd8374867674f15ffa67be052

27.



BellBirdJumpingOffBranch.jpg  
md5hash:  
44d0a2dc29c52a8656  
bd4bdcb12d794c

28.



f0056936.jpg  
md5hash:  
b12a067c033a94b290f  
89a733f6ca72a

29.



f0056944.jpg  
md5hash:  
aea86094a7a46fa0b8f  
f889e9da32ef9

30.	 A photograph showing two Black-necked stilts wading in shallow, rippling blue water. Both birds are captured mid-stride, their long legs extended downwards. Their bodies are black with white wing patches and long, thin bills. The background consists of the textured surface of the water.	BlackNeckedStiltsFromBehind.jpg md5hash: e08381661fdb2f06e0c 15b599dcad571
31.	 A photograph of a small, dark-colored bird perched on a branch. The bird is facing away from the camera, with its back and wings visible. It appears to be in a natural, possibly forested, environment.	f0056952.jpg md5hash: dcf99efec7a00d28ed1 1c8923eb96e95
32.	 A photograph of a black swan swimming in a body of water. The swan's long neck is curved, and its head is partially submerged as it feeds. Its dark feathers and distinctive red bill with a white patch are clearly visible. The water around it shows ripples and reflections.	BlackSwan.jpg md5hash: 64302e831dc5ddb8c9 a0e75781d5c76f

33.	 A black vulture is perched on a weathered wooden post, its wings spread wide in a sunning or preening pose. The background is a soft-focus landscape of green and yellowish tones.	BlackVultureSunningOnPost.jpg md5hash: 6257f2b469c8820c6a8cf7703b9dd7c8
34.	 A bluebird is perched on a thin horizontal wire, facing slightly to the left. The background is a soft-focus green field. A watermark "www.NatureWallpaper.net" is visible at the bottom of the image.	blue_bird2.jpg md5hash: 91e2843f48162ac7a12a777d5e4226f5

**35.**



brd\_Ornithologist\_TW  
G.jpg md5hash:  
beaaf73518d8e49e58f  
116fdbd834f537

**36.**



BarnOwl.jpg md5hash:  
35c82564737216998e  
3d051f286bb728

37.



f0382464.jpg  
md5hash:  
041a23c317560764d1  
1f1003dcb82e2f

38.



GreatBlueHeronWithFi  
sh.jpg md5hash:  
5db35478fd169cf7487  
b1a62ec872ac4

39.



GreatEgretinVoloBog.j  
pg  
md5hash:  
798a2db6f5695328bf8  
d116f2a76f99f

40.



7EYEBTELF1KAN.jpg  
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b23a7e2bb48623

41.



IMG\_3937\_filtered.jpg  
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42.



GreenHeronCloseup.jp  
p  
md5hash:  
acbcef7efb3a148e05  
0d6fe3340b4bd

**43.**



cute\_penguin.jpg  
md5hash:  
915b8be5369cccd6b7c  
c1278eed00b413

**44.**



GreenHeronOnChicagoLakeshore.jpg  
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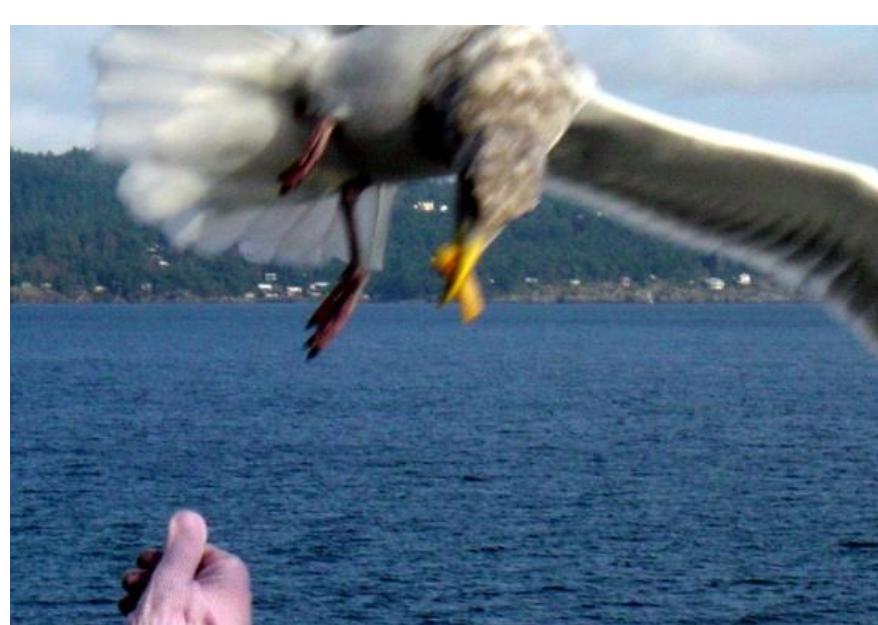
45.		f0387624.jpg md5hash: 7bc7bee527e4bed1af 3f00d328824d27
46.		f0526960.jpg md5hash: b887686b7bfa6e4da1 55ef302a3e04b7

**47.**



ImmatureSnowyEgret  
TakingOff.jpg  
md5hash:  
eb09aea7a30842db52  
a3bb6acf23442b

**48.**



BC7 feeding the  
birds.jpg md5hash:  
f23c5e544e08726e922  
8ca915882976f

49.



Cuban Tody © PeteMorris/Birdquest

Surfbirds.com

June03screen.jpg  
md5hash:  
26ea3ed3b63821dd6e  
d5d0828696d741

50.



Nesting red-winged blackbird/

Carouge à épaulettes en cours de nidification

Mike Hopiak / Cornell Lab of Ornithology

glfs-storm-birds.jpg  
md5hash:  
e1e504e73c0c2944faf  
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51.



colorful-birds.jpg  
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52.



junescreen01.jpg  
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53.

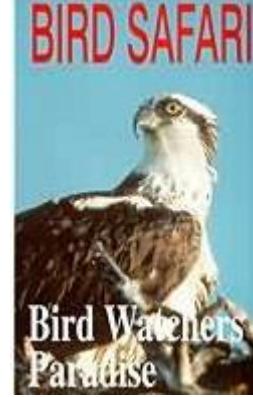


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54.



KeaAndMountain.jpg  
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a46cef1fd7b9735372e  
7fa07d5f05457

55.	 <p data-bbox="319 834 1192 925">Everyone says you're too young for me.</p>	177.jpg md5hash: ac192837bda3a7b224f d259ddad99be5
56.		40m.jpg md5hash: b4f567dead60a82929 31e12ead7911c9
57.		7107298.jpg md5hash: f095a5eee85aa81de77 5e45e481bab94

58.



ready2fledge.jpg  
md5hash:  
25ba487aeb9ae11a3a  
db64e4fb32414b

59.



image\_0.jpg md5hash:  
864459aedb0450e30c  
f384c81d470153

60.



KeaAtTopOfMackinno  
nPass0930.jpg  
md5hash:  
6070cdc8e0c059ad72f  
d782ac8b7f161

61.



KeaEatingRentalCar.jp  
g  
md5hash:  
3db5fb16b446ea0e92  
447cf6399709e9

62.

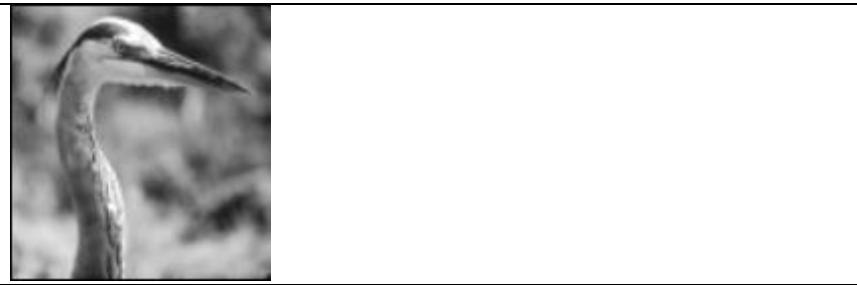


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63.



snow\_geese.jpg  
md5hash:  
55cc22374ddd67183a  
02b2b17d343386

64.		KeaRetrievingBakedBeanCanFromTarn.jpg md5hash: cc51364cd95f021f742 2ab2a219966ef
65.		image12.jpg md5hash: adab3ef8244801d705 50a9b6dd7378b8
66.		image2.jpg md5hash: 4e7a41349cf80f8ce4a bf74aabbc5815
67.		tn_duck_3.jpg md5hash: 526e5d096bbfc21f593 dd2f0b5bcbd6e

68.



image14.jpg md5hash:  
931ad1eaa65a63baf83  
feacf58bcd3b

69.



newbies2.jpg  
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**70.**



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eda55200ce380

**71.**



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**72.**



frankbeecostume\_182  
7\_34457581.jpg  
md5hash:  
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**73.**



frankbeecostume\_182  
7\_84985892.jpg  
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**74.**



frankbeecostume\_182  
7\_96360352.jpg  
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1c333f4aa35fb

**75**



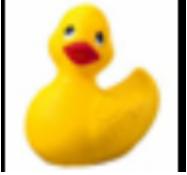
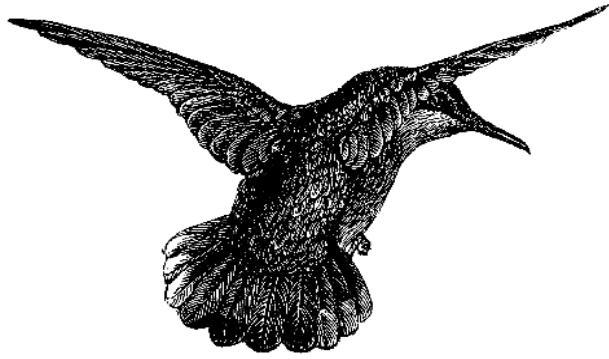
image4.jpg md5hash:  
f07b9ddacd66758480  
58af7732ff8596

**76.**



image1.jpg md5hash:  
df289b9b97460dc484  
1ef8cdff99f6e6

77.		image6.jpg md5hash: 48650701309fdf4d709 d5ac7e7e5d710
78.		f0415008.jpg md5hash: cffb68753718298750d 0b5b130e9c372
79.		f0416072.jpg md5hash: 884104db790c715174 c2ceffff97546

80.		image11.jpg md5hash: 89f7de33f8d532ad981 b9e76621d4966
81.		image5.jpg md5hash: e7e8a371afc6c15ac15 02dc3b7b7046
82.		johndoe.bmp md5hash: 851de535ebf2fecc9d6 ca8c313f313a6
83.		Image1.tif md5hash: 5cf82d5b4a1938dc14a e9c2cec27a7c3

84.



birdtrans2.jpg  
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a92bdcadc88ade

85.

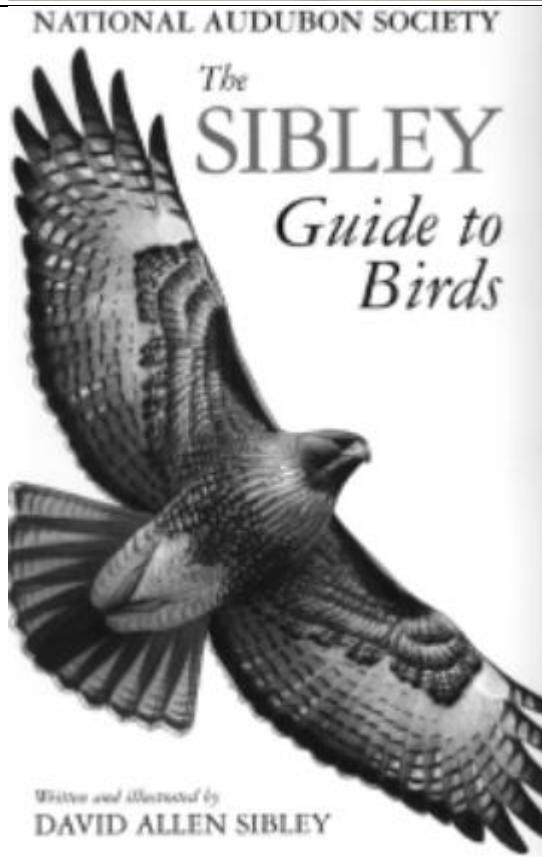


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**86.**

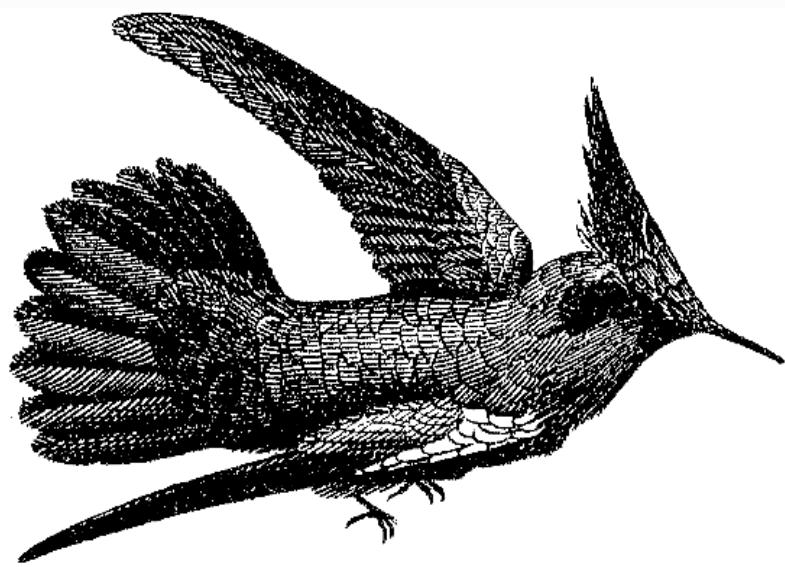


image12.tif md5hash:  
0592a0a3aa8490ded7  
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**87.**



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88.

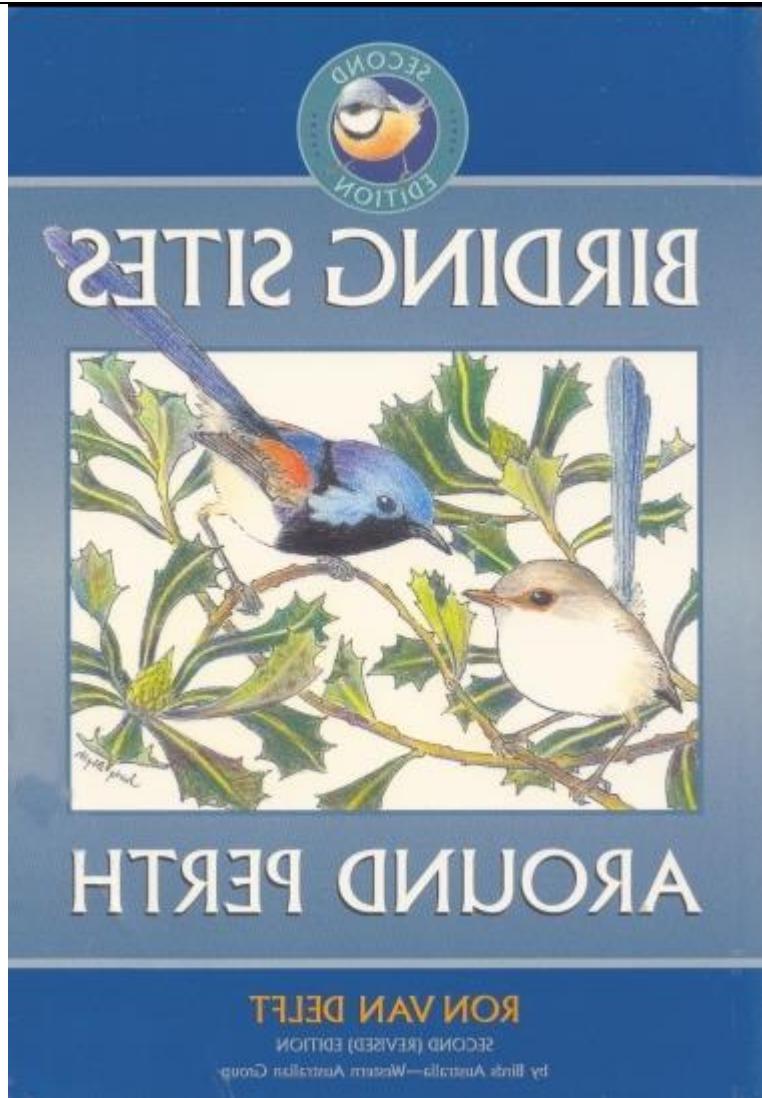


image0.jpg md5hash:  
d83bfed1cb6ddae389  
4b8e2a31421b56

89.



f0438640.jpg  
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84ab7a6f4f27a1e8b93  
433e5b279e68c

90.



f0439400.jpg  
md5hash:  
056347a7d67d714fb5  
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91.



f0441536.jpg  
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92.



f0443520.jpg  
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93.



f0592136.jpg  
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94.



BF5BE9D9d01  
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9f840f5d561

95.



f0360392.jpg  
md5hash:  
37d60053d5e9336516  
887a24bc735edc

## APPENDIX C – NON-BIRD IMAGES

---

NO.	Image	Name on Disk
1.	 A photograph showing three individuals in a grassy field under a clear blue sky. One person in a dark shirt and shorts is reaching up towards a tall white pole or antenna. Another person in a white shirt and light-colored pants stands nearby, and a third person is partially visible in the background. A small wooden birdhouse is mounted on a post in the foreground.	f0493176.jpg md5hash: 66b51673 65db72e8 5039c52b 85ff90c7
2.	 A photograph of two men sitting on a grassy lawn. The man on the left is wearing a grey polo shirt, blue jeans, and sunglasses, with his legs crossed. The man on the right is wearing a dark t-shirt and is looking off to the side. They appear to be engaged in a conversation.	f0494144.jpg md5hash: 15d12508fc51303af27 e4c97faa890e9

3.



f0348056.jpg  
md5hash:  
0f5a1ea46ba156b32f8  
113bf6f84a43c

4.



A9E5105A  
d01  
md5hash:  
9828facb  
e22aec0f0  
93fbdf9f3  
1d751e

5.



7013F58Dd01  
md5hash:  
a0b3ef3e2dd10cc3c43  
4f5b34636903d

6.



f0501184.  
jpg  
md5hash:  
44e820a7  
bad45f1e  
85ea67a3  
8bf960f9

7.		D1D1775Fd01 md5hash: 4ad4f5c4c9579cea56e bca17cd7dd00e
8.		FA73DB84d01 md5hash: f7db0615babea29e6e 759b1849d0a66f
9.		3FB68809d01 md5hash: de5139c857eaa2a13f2 e1b46bbf9663f

**10.**



42626CDDd01  
md5hash:  
c48311098173518bd9  
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**11.**



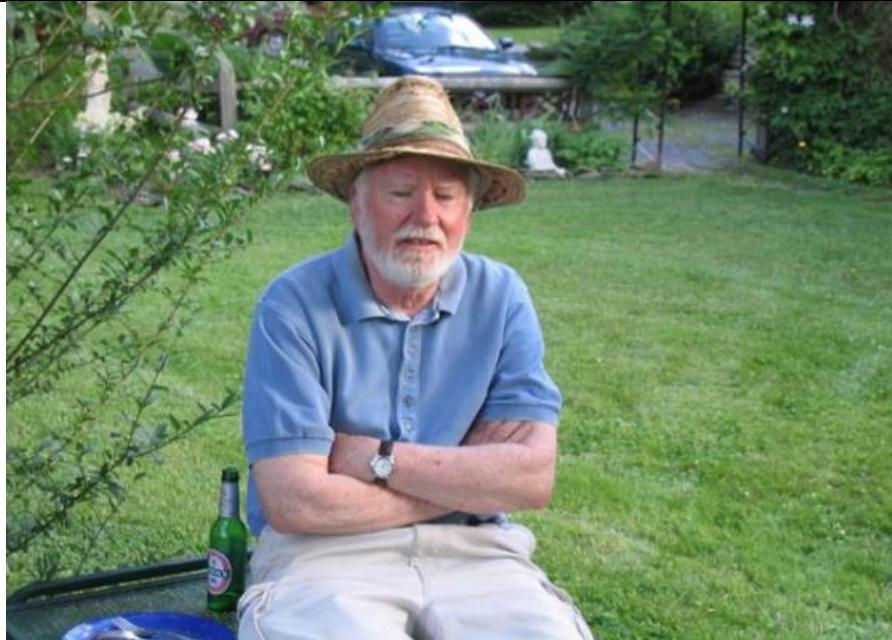
E319CFC2d01  
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**12.**



5C1E7D60d01  
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**13.**



f0508024.jpg  
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**14.**



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**15.**



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**16.**



4058F387d01  
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c6dde3f874f9

**17.**



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cb632d61  
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**18.**



f0525496.  
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5ff7995e7  
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30bcb3a3  
9319d07

**19.**



f0526232.jpg  
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4c7e2d290e03bd

**20.**



f0529544.  
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**21.**



f0533600.  
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061ae04e

**22.**



61C27B40  
d01  
md5hash:  
9dab8c53  
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e18f623e  
69e09ba0

**23.**



f0391728.  
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**24.**



FB4EDA00d01  
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**25.**



f0395576.  
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73f6a8f9d  
4472d730  
0c32e476  
5246709

**26.**



FB4DEA89  
d01  
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f27f7f797  
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e4ff7989c  
82be8f

**27.**



f0395928.  
jpg  
md5hash:  
e04bf80d  
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**28.**



f0399464.jpg  
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985ffe62ed639

**29.**



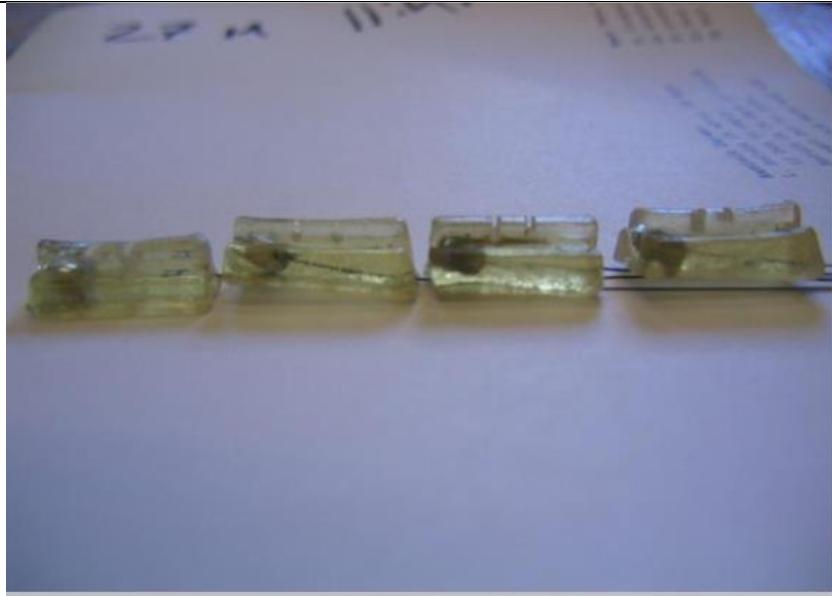
B9D470B5  
d01  
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**30.**



B76BD0A  
Ed01  
md5hash:  
c8bde2f6f  
cf8d842d  
50396850  
4872db3

**31.**



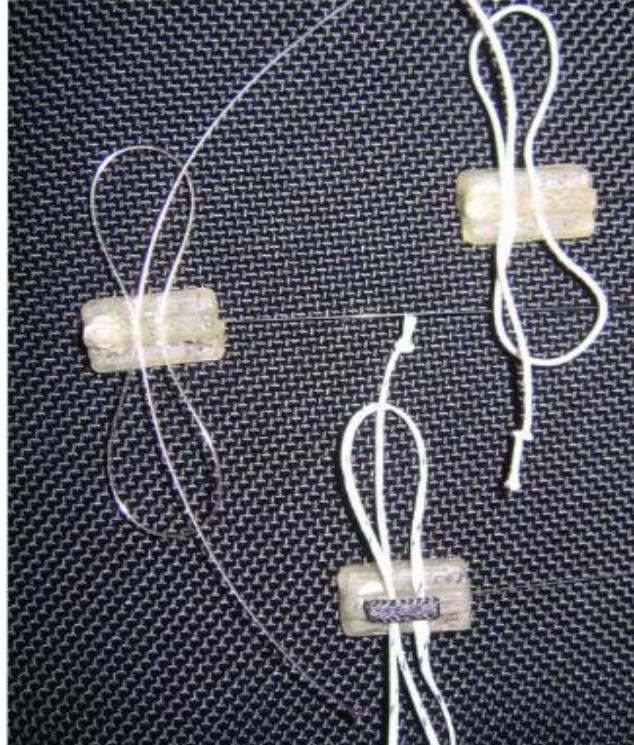
D5FDCCB9  
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13f6cae2e  
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fc70c43

**32.**



5E5570B4  
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md5hash:  
fe1f3a53e  
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cd7db4a

**33.**



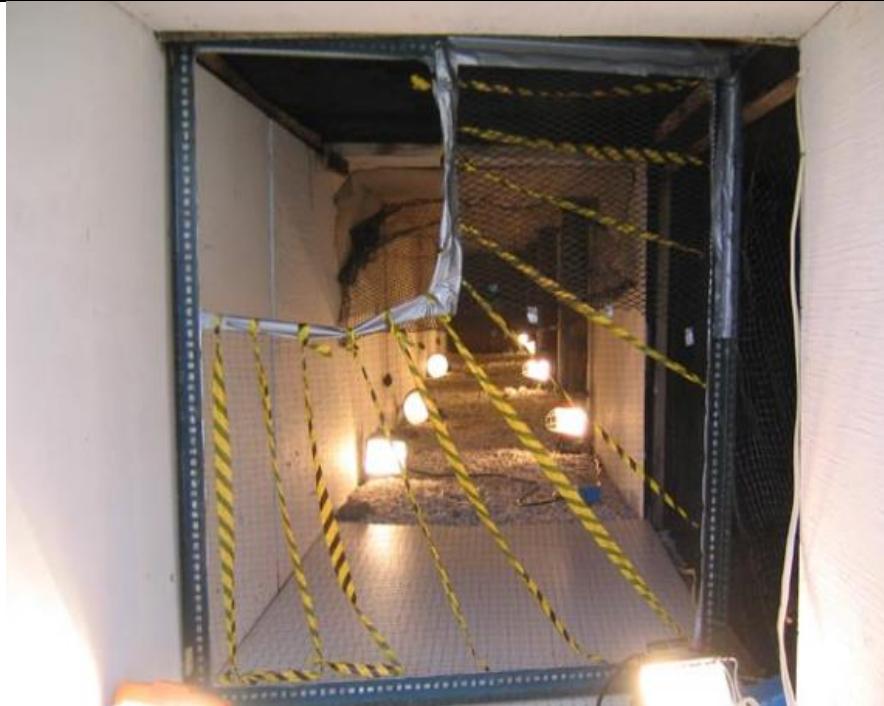
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**34.**



502FE69D  
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d53982ab  
60692f59

**35.**



19E9BA69  
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**36.**



f0438992.  
jpg/42614  
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379745e0  
915d3468

## **APPENDIX D – EMAILS**

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### **7.1.1 Email 1 – Subject : How to Identify Birds**

From Bird Fanciers [mailinglist.birds@example.com](mailto:mailinglist.birds@example.com)

How to Identify Birds

Are you amazed at how quickly birders can identify birds? Actually, it's just like getting to know your human neighbors. When you move into a new neighborhood everyone is a stranger, but soon you learn to tell people apart as you unconsciously catalog their characteristics. Their habits, shape, styles of walking, and "habitats" become familiar enough that you can recognize each neighbor immediately, even at a distance.

Paying attention to individual differences can help you identify birds, too. You can recognize many birds simply by noting their shapes, even if seen only in silhouette. Other useful characteristics are a bird's posture, size (easiest to judge if you use familiar birds as a size reference), flight pattern and/or head-on flight profile, and the kind of habitat in which the bird was seen.

Start by learning to identify general groups of birds- warblers, flycatchers, hawks, owls, wrens- whose members all share certain similarities. As your observation skills improve, familiarize yourself with the field marks- colored or patterned areas on the bird's body, head, and wings- that help distinguish species.

### **7.1.2 Email 2 – Subject : Good Pics**

From Ben Forbes [ben@example.com](mailto:ben@example.com)

Hi thought you'd like these

enjoy

3 Attachments

/img\_johnDoe.dd/vol\_vol2/Documents and Settings/johndoe/Application  
Data/Thunderbird/Profiles/8jiqrt8v.default/Mail/Local Folders/Inbox/7EYBTELF1KAN.jpg

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### **7.1.3 Email 3 – Subject : expensive birds**

A young woman was walking past a pet shop and saw an exotic, white cockatoo for sale. The price was \$6000. She entered the store and asked the clerk why the bird was so expensive. The clerk told her that the bird spoke 6 different languages. "Does it speak English?" asked the woman. "Of course it does!" said the clerk.

The woman thought about her mother who was multi-lingual, a bit of a recluse and lived all alone.

She decided to purchase the bird and send it to her mother as a companion. She paid for the bird and made arrangements for it to be delivered. The following day, the woman telephoned her mother. "Mama, did you like the cockatoo that I sent you?" "Oh it was delicious!" she replied." "Mama, what do you mean delicious?" "I made soup out of it."

"But mama, that bird spoke six different languages!"

"Oh dear! Why didn't it say something?"

#### 7.1.4 Email 4 – Subject : some more good pics

From Ben Forbes [ben@example.com](mailto:ben@example.com)

Thanks for the pics you sent me here are some I really like

5 Attachments

/img\_johnDoe.dd/vol\_vol2/Documents and Settings/johndoe/Application  
Data/Thunderbird/Profiles/8jiqrt8v.default/Mail/Local Folders/Inbox/glfstrom-birds.jpg

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## APPENDIX E – DOCUMENTS

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- 8) option: value="http://home.about.com/homegarden/video/personalspace.htm?ap=1"
- 9) option: value="http://home.about.com/homegarden/video/christmastrads.htm?ap=1"
- 10) map: name="Map"
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- 9) option: value="http://about.edmunds.com/new/2004/honda/element/100375786/photogallery.html?pg\_type=SUV&imgsrc=&tid=abo.n.researchlanding.photo..1.Honda"
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- 11) option: value="http://about.edmunds.com/new/2005/chrysler/ptcruiser/100465990/researchlanding.html?tid=abo.n.prices.subnavheader..2.Chrysler"
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9) area target="\_blank" shape="rect" coords="370,25,529,47" href="http://n479ad.doubleclick.net/click%3Bh=v4%7C3213%7C3%7C0%7C%2a%7Cq%3B13190178%3B0-0%3B0%3B7596722%3B6768-728%7C91%3B8465064%7C8482960%7C1%3Bu%3D0mfh7s21101oi%3B%7Eaopt%3D0%7Cff373b%3B%7Essc%3D%3fhttp%3a%2%2fentrepreneurs.about.com/gi/pages/poll.htm?pol\_id=4944697103&poll=3&submit=Submit+Vote"  
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## **7.1.8 ostbk2b2.htm**

### **FACILITIES**

#### **CHICKS**

Young chicks can be maintained in a variety of suitable facilities. A small portable pen, 12 feet long, 4 feet wide and 2 foot high can be adequate for a number of chicks. The pen is placed on short cut grass and moved daily. Chicks are brought out to the pen after the temperature reaches above 60 F and the sun is shining. Birds can be maintained in this type of facility until the temperature drops or until weather is prohibitive. Include some type of shade and wind break as young birds are sensitive to extreme sun and wind.

Young birds should be brought indoors in the evening and maintained in a heated environment until at least 2 to 3 months of age. Temperature in indoor shelters should be maintained at least 65 F and enough room to allow the birds to exercise should be provided. In areas where weather is more severe, this period may need to be extended.

Do not provide feed at night but available water is acceptable. Feed the young birds as outlined in CARE OF YOUNG BIRDS section, prior to turning them out in the morning.

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#### **JUVENILES**

Juvenile birds between 3 and 10 months of age can be maintained in a similar, but larger facility as young birds. For convenience, access to the indoor facility should be available directly from the outdoor pens. However, shelter is not needed except in extremely cold areas. The amount of space per bird, for both indoor and outdoor facilities should be increased for this age bird as compared to that available for younger chicks. Outdoor pens can be of any type of substrate but ground cover such as grass, clover, or alfalfa is ideal. Grass should be kept at a closely mowed level, especially when grass begins to dry out or turn to seed, as impactions are more common at this time. Daily mowing may be necessary during some periods of the year.

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#### **ADULTS**

#### **ADULTS**

Pens and facilities for adults vary considerably. Most ranchers maintain adult pairs or trios in facilities that range from five thousand square feet to an acre or more. In general, the more room that can be provided, the better the situation. Common fences and line of sight access to neighboring pairs is often desirable but may not be practicable with overly aggressive males.

Housing or shade is usually provided although not always utilized. If birds are accustomed to being fed and watered in a shed they will be more easily confined when necessary and may build the nest and lay indoors. Alley-ways for movement of birds from pen to pen, access for hailing, and provisions for confinement for veterinary care should be considered at the time of construction. Although surprising, most ratites do not require indoor shelter once over 6 months of age and often refuse to use such structures, independent of weather.

Fencing is dependent on personal preference and economics. Chain link is good but may result in problems related to leg and foot injuries and is not easily climbed if escape from the pen by egg gatherers is necessary. Tubular "cattle" type fence is suitable and offer some benefits and others types of woven wire fencing are routinely used.

Many ranchers are now utilizing group pens consisting of several males and numerous females in larger acreage. This appears to provide some benefits and is more nearly similar to a natural situation. Early results indicate that increased fertility, more egg numbers, and extended laying periods can be expected in this type of set up. Several acres of enclosed pasture are needed for this type of operation.

Difficulties with a group breeding situation include the inability to determine exactly the resultant chicks parentage.

Ostrich Book

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## **7.1.9 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](mailto:bcst@box1.a-net.net.th)

Tel: 66-(0)-2943-5965

Web sites:

[www.bcst.org/index\\_ebird.html](http://www.bcst.org/index_ebird.html)

[www.thai.net/bcst](http://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](mailto:utree@loxinfo.co.th)

[mail@orientalbirdclub.org](mailto:mail@orientalbirdclub.org)

Web site: [www.orientalbirdclub.org](http://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](mailto: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 INTHONON - DOI SUTHEP

The Himalayan Springs of Thailand

SBN 974-8252-67-1

· PHU LUANG

The Kingdom of Plants

## 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](mailto:bcst@box1.a-net.net.th)

Tel: 66-(0)-2943-5965

Web sites:

[www.bcst.org/index\\_ebird.html](http://www.bcst.org/index_ebird.html)

[www.thai.net/bcst](http://www.thai.net/bcst)

\* The Bird Conservation Society of Thailand (BCST) is a BirdLife Partner

· TO REPORT EVIDENCE OF SUSPICIOUS ACTIVITY

Please contact

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

1. Phasianidae (wood partridges and pheasants) - 4 species

2. Anatidae (White-winged duck) - 1 species

3. Picidae (woodpeckers and barbets ) - 3 species

4. Bucerotidae (hornbills) - 7 species

5. Upupidae (Common hoopoe) - 1 species

6. Cuculidae (Coral-billed ground cuckoo) - 1 species

7. Psittacidae (parrots and parakeets) - 4 species

8. Columbidae (pigeons) - 12 species

9. Accipitridae (birds of prey) - 9 species

10. Threskiornithidae (White-shouldered ibis) - 1 species

11. Ciconiidae (Lesser adjutant) - 1 species

12. Pittidae (pittas) - 3 species

13. Irenidae (Asian fairy bluebird and leafbirds) - 6 species

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

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

16. Sturnidae (starlings and mynas) - 3 species

17. Paridae (Yellow-cheeked tit) - 1 species

18. Pycnonotidae (bulbuls) - 7 species

19. Zosteropidae (Japanese white-eye) - 1 species

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

21. Nectariniidae (Scarlet-backed flowerpecker) - 1 species

22. Passeridae (weavers and munias) - 7 species

23. 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.

#### 7.1.10 Guide.doc (f0005504\_An\_Insiders\_Guide\_to\_Enjoying\_Your\_First\_Birding\_Field\_Trip.doc) 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. If 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.

This guide has been reproduced with the permission of Pete Dunne. Minor editing by Ron Bourque.

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Front cover of the 23 page document

## 7.1.12 University of California Botanical Garden newsletter (f0273688\_newsletter\_Win\_201.q.pdf)



# UNIVERSITY OF CALIFORNIA BOTANICAL GARDEN

NEWSLETTER

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Spring 2001

### Birds at the UCBG

"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 staff a parade of avid birdwatchers in full.

Our resident birds, however, whether it's an acrobatic jay or 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. Western, California thrashers, and



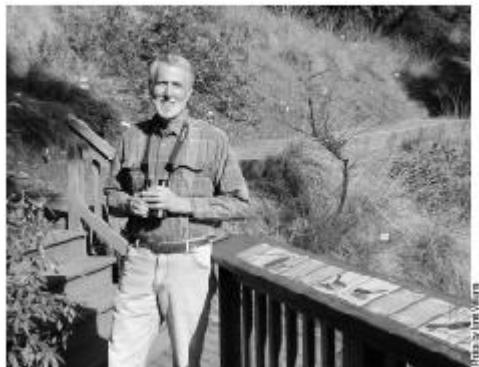
Also in the Southern African Area attract birds including a noisy woodpecker or a colorful finch, provide plenty of ongoing interest for the Garden community.

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 humming-

birds 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 hemit and black-throated warblers.

—Dennis Wolff

*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's 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.*

### 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



## 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, win-

ter, 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 speculation at a glance.

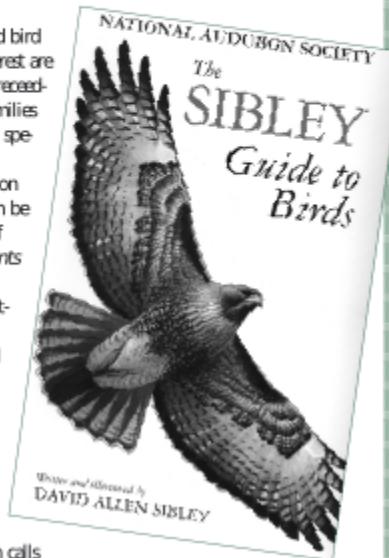
In many ways the publication of *The Sibley Guide to Birds* can be compared to the publication of *The Jepson Manual: Higher Plants of California* a few years ago. Both were preceded by respected long-used references. It is likely that the *Sibley Guide* will become the current authority for birds, as 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-cago" 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 Beamer; 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 irreplace-

able. 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 saglionis and at right: Euphorbia cf. leuconeura.*

Our collaboration with East Bay Municipal 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 Sedlock, accompanied by Mark Flanagan, "Keeper of the Garden" at Windsor Great Park, and William McNamee, 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 occurring 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, (*Lycopodium 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 county 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



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

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.

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 Phytopthora: a new disease", in Marin County, hosted by UC Cooperative Extension on March 9th.

**CHANNEL ISLAND VISIT...**Horticulturist **Nathan Smith** accompanied **Steven Juska**, 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 mycorrhize 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. Sheffer

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.



LESLIE WOZNIAK



## EDUCATION AT THE GARDEN

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.

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 matorral, South Africa's fynbos, and the



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.

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 Lys, 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 Max 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 Edevelander**, University of Toronto, received leaf bases of *Zamia integrifolia*. These were plants used by Dr. Robert Onduff 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*, *Illiadum mexicanum*, *Illiadum 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 desiccation 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 Meamer McAbee**, graduate student at UC Davis with Prof. **Charles Gasser**, visited to obtain cuttings of *Impatiens hockiana* and *Impatiens balsamina* 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 Salyon**, dissertation student at Arizona State University, is working on the molecular systematics of the Myrtaceae family. He received cuttings of *Eugenia capuli*, *Austromyrtus dulcis*, *Myrcia guianensis*, *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 *Hibbertia scandens* Dillen, 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 Baldzkiowski  
 Ms. Marge W. Barry  
 Mrs. Wendy S. Bergman & Mr. Robert G. Bergman  
 Ms. Barbara Boster  
 Ms. Suzanne M. Briley  
 Ms. Michaela Brockstedt  
 Dr. and Mrs. Daniel Callahan  
 Ms. Diwyn Daniels Robbie  
 Mr. and Mrs. Randy Davis  
 Mrs. Lois De Domenico  
 Mr. Bob Deloria  
 Ms. Carmel Drudy  
 Ms. Anna Eastwood  
 Ms. J. M. B. Edwards  
 Dr. and Mrs. Ray Ergas  
 Mr. Raymond Ford  
 Mr. Sam Foushee  
 Ms. Gloria Galindo  
 Ms. Judith E. Garvens  
 Mr. Kent N. Garvens  
 Mr. Patrick Gavin Duffy  
 Ms. Penelope E. Gordon  
 Ms. Anna Greenwood  
 Ms. Alix Greenwood  
 Ms. Jeane Hamilton-Leddy  
 Mr. and Mrs. Alan Hoben  
 Ms. Lynne Holley  
 Mr. and Mrs. David Huang  
 Ms. Laura J. Kanik  
 Ms. Gretchen Kell  
 Ms. Sydney Kustu  
 Ms. Marie C. Lagrada  
 Ms. A. Lim & Mr. K. Henderson  
 Ms. Kiamara Ludwig  
 Ms. Karen Maghebian  
 Ms. Pradeep & Mr. Karak Mathew  
 Ms. Helen McKinley  
 Mrs. Laura Miller & Mr. Dave Miller  
 Mr. Charles L. Moreau  
 Ms. Aleendra Moss  
 Ms. Phyllis Peacock  
 Ms. Phyllis Potter & Ms. Nora Underwood  
 Ms. Delaine Renard & Mr. Bruce Bedortha  
 Ms. Janet A. Rudolph  
 Ms. Jeanine Sidran  
 Mr. Steve Siver  
 Ms. Jean Smith  
 Ms. Laura Suecka  
 Ms. Anita L. Thomas  
 Mr. Dan Viera  
 Ms. Virginia C. von Colditz

### 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 Clandinen  
 Mr. and Mrs. Fred Dengler  
 Mr. and Mrs. Jack Dolhinow  
 Dr. and Mrs. A. Carl Helmholz  
 Ms. Fonda Karelitz  
 Mr. and Mrs. Ron Lal  
 Mr. Jim Lovkin & Prof. Iris Tommekin  
 Mr. and Mrs. Geoff Machin  
 Mr. and Mrs. Stuart McDonald  
 Mr. Bill McJohn  
 Mr. Ron Morrison  
 Ms. Sally O'Connell  
 Ms. Ann Reynolds  
 Mr. and Mrs. Weldon Rucker  
 Mr. Bernard Taper & Ms. Gwen Head  
 Ms. Carol Thompson & Mr. Rodene Duncan  
 Mr. and Mrs. William D. Watkins  
 Mr. Stewart Winchester  
 Mr. Thomas (Rex) Wolf

Ms. Elenor Mulkey  
 Ms. Mildred J. O'Connor  
 Ms. Jean Portillo  
 Ms. Jacqueline Woodfill & Mr. John Woodfill  
 (MyrtleWolf Library)

**James Harold Van Sickle** from:  
 Mr. and Mrs. Richard Arundan  
 Mr. and Mrs. Bill Bade  
 (Entrance Improvement)  
 Mr. Michael Gilmore & Family  
 Mr. Bruce Hayes  
 Mr. & Mrs. R. Sheldon Milligan, Jr.  
 Mr. John P. Stock

### 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. MyrtleWolf

### 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  
 (Ornduff Fund for Garden Interpretation & Docent Activities)

### In Memory

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

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

**Joan & Earl Hyde** from:  
 Mr. and Mrs. Harry Heckman  
 (MyrtleWolf Library)

**Josephine Tonge Larson** from:  
 Mr. and Mrs. Bill Bade  
 (MyrtleWolf Library)

Ms. Ellen Felker

### 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 Domalski, Judith Finn, Jerry Parsons, Peter Klement, Gerald Ford. (Front, left to right) Elaine Sedlack, Nancy Swearingen, 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 Swearingen** for 10+ years of service to **Elaine Sedlack** for 15+ years; to **Peter Klement** and **Roger Raiche** for 20+ and to **John Domalski** 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 Altera** and **Ms. Louise Dutton**. Thank you very much indeed!

#### GARDEN STAFF

Dr. Ellen Simms, Garden Director

##### ADMINISTRATION

Afroca Naid, Administrative Assistant  
Margaret Richardson, Tour & Rentals Coordinator  
Michael Rimer, Administrative Assistant  
Candice Schott, Business Operations Supervisor  
Nancy Swearingen, Volunteer Services Coordinator  
Janet Williams, Marketing & Development Officer  
Leslie Wozniak, Visitor Services Specialist

##### COLLECTIONS & HORTICULTURE

Dr. Christopher Carruthers,  
Manager of Collections and Horticulture  
Holly Forbes, Curator  
Barbara Keller, Curatorial Assistant  
Anthony Garza,  
Supervisor of Horticulture and Grounds  
John Domalski, Propagator  
Judith Finn, Horticulturist  
Peter Klement, Horticulturist  
Lawrence Lee, Horticulturist  
Jerry Parsons, Horticulturist  
Dr. Robert Rabie, Garden Pathologist  
Roger Raiche, Horticulturist  
Eric Schulz, Horticulturist  
Elaine Sedlack, Horticulturist  
Nathan Smith, Horticulturist  
Gerald Ford, Building and Grounds Maintenance

##### EDUCATION

Dr. Jennifer White, Associate Director for Education  
Christine Manoux, Program Assistant

##### FACULTY ADVISORY COMMITTEE

Dr. Nan Crystal Arens, Integrative Biology  
Dr. Lewis Feldman, Plant Biology  
Dr. Joe McBride, Environmental Science  
Policy & Management  
Dr. Brent Mishler, Integrative Biology  
Dr. Vincent Rest, Environmental Science  
Policy & Management  
Dr. Alan Smith, Herbarium

##### NEWSLETTER

Janet Williams, Editor

Administration 642-0849  
Development 643-2937  
Director's Office 643-6999  
Education 485-2805  
Entrance Kiosk 643-2755  
The Garden Shop 642-3343  
Plant Collections 643-8040  
Tours/Rentals 642-3352  
Volunteers 643-1924

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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.

University of California Botanical Garden

## Second Annual Garden Party

Please Join Us!

Enjoy fabulous food, wine and music,  
stroll around the Garden at the peak of its glory,  
and tour the newly renovated South African Desert Habitat.  
At 4 PM we'll celebrate the opening of  
the new Desert Greenhouse!

Saturday, June 16, 2001, 3 - 6 PM



J. Dorn

Your reservation will be acknowledged by postcard. Please bring postcard to the event.

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

University of California Botanical Garden  
200 Centennial Drive, #5045  
Berkeley, California 94720-5045

Address Service Requested

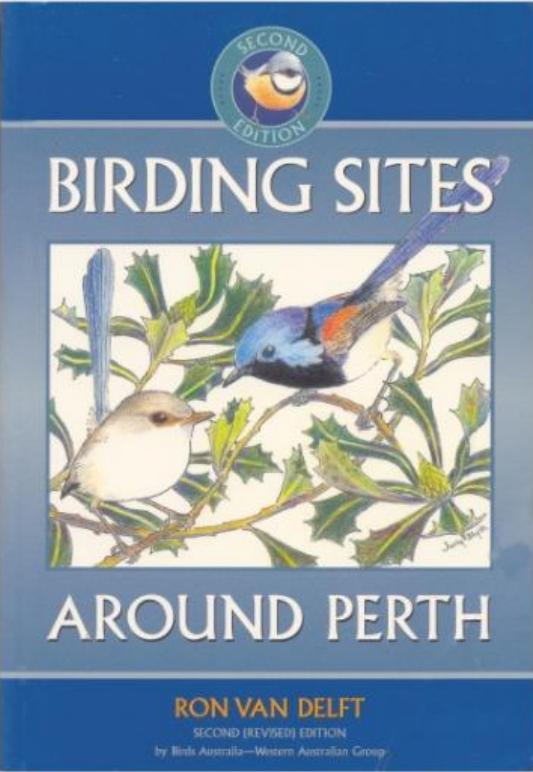
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PAID

University of California

Plants are for sale at The Garden Shop all year. Call 510-642-3343



**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](mailto:birdswa@iinet.net.au)  
Web: [birdswa.iinet.net.au](http://birdswa.iinet.net.au)



## 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 put 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.

## 7.1.13 F0095922.txt – link from email appendix in the report

### 7.1.14 Birding\_p\_js.txt

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unction w(p){document.writeln(p)};function zlod(t,u,s){t.length>s?t.substring(0,s)+'
```

'+t:w(' <tr><td class="ch">&#149; <a href="'+u+'>' +t+' </a></td></tr>') }function zlobj(a,h,s,c){  
var j=0,l=a.length,i=1;w(' <table border="0" cellpadding="1" cellspacing="0" width="100%"><tr><td class="tl">' +a[0] +' </td></tr>');while(j++<h){zlod(a[i++],'http://clk.about.com/?zi=' +c+'&zu=' +a[i++],s);j=(i==l)?h:j;w(' </table>')}

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var zlmp = new Array('Most Popular Articles','Alphabetical Index of Birds','http://birding.about.com/library/blalphatypeofbird.htm','Specs for Building Birdhouses and for use in Bird House Plans','http://birding.about.com/library/blhousesp.htm','FREE Holiday Bird Clipart - Valentine's Day Index','http://birding.about.com/library/blclip-direct-val.htm','Butterfly and Bee Free Clipart Index','http://birding.about.com/library/blclip-butterflies.htm','Free Bird Clipart Index - Eagles','http://birding.about.com/library/blclip-type-eagles.htm','Christines Free Bird Bee Butterfly Clipart','http://birding.about.com/library/blclip-direct.htm','Birding and Birdwatching - Build a Bluebird Nest Box for Wild Birds','http://birding.about.com/library/weekly/aa010703a.htm','Wild Bird Photography Library','http://birding.about.com/library/weekly/aa020100a.htm','Cooking FOR the Birds - Recipe Collection - Attracting Bird and Butterflies with a Garden Habitat - Butterfly and Bird Garden','http://birding.about.com/library/weekly/aa031300a.htm','Wild Bird Photography Library Arranged by Species','http://birding.about.com/library/blphotobird.htm');
```

## APPENDIX F – BROWSER ANALYSIS

### Browsing History (Internet Explorer)

#### 7.1.14.1 Thunderbird download

191 | <http://download.mozilla.org/?product=thunderbird&os=win&lang=en-US>

#### 7.1.14.2 Firefox download

198 | <http://download.mozilla.org/?product=firefox&os=win&lang=en-GB>

### Browsing History (Firefox)

#### 7.1.14.3 Search for birds and pbs.org

● <a href="http://www.google.co.uk/search?client=firefox-a&amp;rll=org.mozilla%3Aen-GB%3Aofficial_s&amp;hl=en&amp;q=birds&amp;meta=&amp;btnG=Google+Search">http://www.google.co.uk/search?client=firefox-a&amp;rll=org.mozilla%3Aen-GB%3Aofficial_s&amp;hl=en&amp;q=birds&amp;meta=&amp;btnG=Google+Search</a>	02/02/2005 14:11:46	google.co.uk	Google Search: birds
● <a href="http://www.pbs.org/lifeofbirds/">http://www.pbs.org/lifeofbirds/</a>	02/02/2005 14:11:54	pbs.org	The Life of Birds
● <a href="http://www.pbs.org/lifeofbirds/songs/index.html">http://www.pbs.org/lifeofbirds/songs/index.html</a>	02/02/2005 14:12:05	pbs.org	The Life of Birds   Songs

#### 7.1.14.4 Amazon book search

● <a href="http://www.amazon.co.uk/exec/obidos/external-search/026-5665785-2744400?tag=roscosolutions&amp;keyword=birds&amp;mode=books-uk">http://www.amazon.co.uk/exec/obidos/external-search/026-5665785-2744400?tag=roscosolutions&amp;keyword=birds&amp;mode=books-uk</a>	02/02/2005 14:14:49	amazon.co.uk	Amazon.co.uk: Search Results Books: birds
● <a href="http://www.amazon.co.uk/exec/obidos/ASIN/0007176147/qid=1107353690/sr=2-1/ref=sr_2_11_1/026-5665785-2744400">http://www.amazon.co.uk/exec/obidos/ASIN/0007176147/qid=1107353690/sr=2-1/ref=sr_2_11_1/026-5665785-2744400</a>	02/02/2005 14:14:59	amazon.co.uk	Amazon.co.uk: Books: Garden Birds Collins Gem S.
● <a href="http://www.amazon.co.uk/exec/obidos/ASIN/0713666161/qid=1107353690/sr=2-3/ref=sr_2_11_3/026-5665785-2744400">http://www.amazon.co.uk/exec/obidos/ASIN/0713666161/qid=1107353690/sr=2-3/ref=sr_2_11_3/026-5665785-2744400</a>	02/02/2005 14:15:29	amazon.co.uk	Amazon.co.uk: Books: The Secret Lives of Garden Birds

#### 7.1.14.5 Wallpaper website and ad

● <a href="http://www.google.co.uk/search?q=bird+wallpaper&amp;sourceid=mozilla-search&amp;start=0&amp;start=0&amp;ie=utf-8&amp;oe=utf-8&amp;client=firefox-a&amp;rll=org.m...">http://www.google.co.uk/search?q=bird+wallpaper&amp;sourceid=mozilla-search&amp;start=0&amp;start=0&amp;ie=utf-8&amp;oe=utf-8&amp;client=firefox-a&amp;rll=org.m...</a>	02/02/2005 14:15:42	google.co.uk	Google Search: bird wallpaper
● <a href="http://www.naturewallpaper.net/birds_L.html">http://www.naturewallpaper.net/birds_L.html</a>	02/02/2005 14:15:51	naturewallpaper.net	Free Bird Wallpaper - Bald Eagle Albatross Owl Fa...
● <a href="http://as.casalemedia.com/?s=53524&amp;u=http%3A//www.naturewallpaper.net/birds_L.html&amp;f=2&amp;id=5780266264.517584">http://as.casalemedia.com/?s=53524&amp;u=http%3A//www.naturewallpaper.net/birds_L.html&amp;f=2&amp;id=5780266264.517584</a>	02/02/2005 14:15:51	as.casalemedia.com	
● <a href="http://pagead2.googlesyndication.com/pagead/ads?client=ca-pub-0241683974610684&amp;dt=1107353756202&amp;lmt=1107353751&amp;format=468x60_as...">http://pagead2.googlesyndication.com/pagead/ads?client=ca-pub-0241683974610684&amp;dt=1107353756202&amp;lmt=1107353751&amp;format=468x60_as...</a>	02/02/2005 14:15:56	pagead2.googlesy...	
● <a href="http://isg10.casalemedia.com/V2/40842/43608/">http://isg10.casalemedia.com/V2/40842/43608/</a>	02/02/2005 14:15:56	isg10.casalemedia...	3-Home
● <a href="http://isg10.casalemedia.com/V2/40842/43608">http://isg10.casalemedia.com/V2/40842/43608</a>	02/02/2005 14:15:56	isg10.casalemedia...	
● <a href="http://asg36.casalemedia.com/s?s=53524&amp;u=http%3A//www.naturewallpaper.net/birds_L.html&amp;f=2&amp;id=5780266264.517584">http://asg36.casalemedia.com/s?s=53524&amp;u=http%3A//www.naturewallpaper.net/birds_L.html&amp;f=2&amp;id=5780266264.517584</a>	02/02/2005 14:15:56	asg36.casalemedia...	
● <a href="http://www.naturewallpaper.net/birdsLpages/image4.html">http://www.naturewallpaper.net/birdsLpages/image4.html</a>	02/02/2005 14:16:21	naturewallpaper.net	bald_eagle3.jpg
● <a href="http://pagead2.googlesyndication.com/pagead/ads?client=ca-pub-0241683974610684&amp;dt=1107353782360&amp;lmt=1107353781&amp;format=468x60_as...">http://pagead2.googlesyndication.com/pagead/ads?client=ca-pub-0241683974610684&amp;dt=1107353782360&amp;lmt=1107353781&amp;format=468x60_as...</a>	02/02/2005 14:16:21	pagead2.googlesy...	
● <a href="http://media.fastclick.net/w/get.media?t=n&amp;sid=11194&amp;m=1&amp;f=b&amp;v=1.4&amp;c=1495&amp;r=http%3A//www.naturewallpaper.net/birds_L.html&amp;d=f">http://media.fastclick.net/w/get.media?t=n&amp;sid=11194&amp;m=1&amp;f=b&amp;v=1.4&amp;c=1495&amp;r=http%3A//www.naturewallpaper.net/birds_L.html&amp;d=f</a>	02/02/2005 14:16:21	media.fastclick.net	Winner !!!!
● <a href="http://www.naturewallpaper.net/birdsLpages/image21.html">http://www.naturewallpaper.net/birdsLpages/image21.html</a>	02/02/2005 14:18:45	naturewallpaper.net	snow_geese.jpg
● <a href="http://pagead2.googlesyndication.com/pagead/ads?client=ca-pub-0241683974610684&amp;dt=1107353925746&amp;lmt=1107353925&amp;format=468x60_as...">http://pagead2.googlesyndication.com/pagead/ads?client=ca-pub-0241683974610684&amp;dt=1107353925746&amp;lmt=1107353925&amp;format=468x60_as...</a>	02/02/2005 14:18:45	pagead2.googlesy...	
● <a href="http://media.fastclick.net/w/get.media?t=n&amp;sid=11194&amp;m=1&amp;f=b&amp;v=1.4&amp;c=7262&amp;r=http%3A//www.naturewallpaper.net/birds_L.html&amp;d=f">http://media.fastclick.net/w/get.media?t=n&amp;sid=11194&amp;m=1&amp;f=b&amp;v=1.4&amp;c=7262&amp;r=http%3A//www.naturewallpaper.net/birds_L.html&amp;d=f</a>	02/02/2005 14:18:45	media.fastclick.net	Winner !!!!
● <a href="http://pagead2.googlesyndication.com/pagead/iclk?sa=l&amp;ai=Bv4uhneAAQfmAqX-QcmCpMoK0MuACPLnwJwBwl23AcC4AhACGAlg05zASgCQ..">http://pagead2.googlesyndication.com/pagead/iclk?sa=l&amp;ai=Bv4uhneAAQfmAqX-QcmCpMoK0MuACPLnwJwBwl23AcC4AhACGAlg05zAS...</a>	02/02/2005 14:19:48	pagead2.googlesy...	
● <a href="http://pagead2.googlesyndication.com/pagead/adclick?sa=L&amp;ai=Bv4uhneAAQfmAqX-QcmCpMoK0MuACPLnwJwBwl23AcC4AhACGAlg05z2AS..">http://pagead2.googlesyndication.com/pagead/adclick?sa=L&amp;ai=Bv4uhneAAQfmAqX-QcmCpMoK0MuACPLnwJwBwl23AcC4AhACGAlg05z2AS..</a>	02/02/2005 14:19:48	pagead2.googlesy...	
● <a href="http://uk.shop.com/amos/cc/main/ccn_search_cats/st/bald+eagle/sy/products/ccsyn/518/SourceID/30">http://uk.shop.com/amos/cc/main/ccn_search_cats/st/bald+eagle/sy/products/ccsyn/518/SourceID/30</a>	02/02/2005 14:19:56	uk.shop.com	SHOP.COM - Search results for bald eagle
● <a href="http://amos.shop.com/amos/cc/main/catalog/pcd/7107298/prd/10187717/ccsyn/518/_x/_Choices---Movies-Bird-Safari---Bird-Watcher's...">http://amos.shop.com/amos/cc/main/catalog/pcd/7107298/prd/10187717/ccsyn/518/_x/_Choices---Movies-Bird-Safari---Bird-Watcher's...</a>	02/02/2005 14:20:19	amos.shop.com	SHOP.COM - Bird Safari - Bird Watcher's Paradise

### 7.1.14.6 Search for bird stories and Caring and building for birds

<a href="http://www.google.co.uk/search?hl=en&amp;client=firefox-a&amp;rls=org.mozilla%3Aen-GB%3Aofficial&amp;q=bird+stories&amp;btnG=Search&amp;meta=">http://www.google.co.uk/search?hl=en&amp;client=firefox-a&amp;rls=org.mozilla%3Aen-GB%3Aofficial&amp;q=bird+stories&amp;btnG=Search&amp;meta=</a>	02/02/2005 14:22:25	google.co.uk	Google Search: bird stories	44
<a href="http://z.about.com/5/ad/go.htm?gs=birding">http://z.about.com/5/ad/go.htm?gs=birding</a>	02/02/2005 14:22:38	z.about.com	Google Offers	47
<a href="http://z.about.com/0/0/p/512/6.htm">http://z.about.com/0/0/p/512/6.htm</a>	02/02/2005 14:22:38	z.about.com		50
<a href="http://z.about.com/0/0/p/512/12.htm">http://z.about.com/0/0/p/512/12.htm</a>	02/02/2005 14:22:38	z.about.com		51
<a href="http://z.about.com/0/0/p/496/0.htm">http://z.about.com/0/0/p/496/0.htm</a>	02/02/2005 14:22:38	z.about.com	Untitled Document	49
<a href="http://n479ad.doubleclick.net/adi/ab.hobbies/hobbies_birding;svc=s;site=birding;t=14;pcc=1;fd=0;fs=0;a=;bjp=pid512;kw=;chan=hobbies;syn=ab...">http://n479ad.doubleclick.net/adi/ab.hobbies/hobbies_birding;svc=s;site=birding;t=14;pcc=1;fd=0;fs=0;a=;bjp=pid512;kw=;chan=hobbies;syn=ab...</a>	02/02/2005 14:22:38	n479ad.doubleclick...	Click Here!	48
<a href="http://birding.about.com/od/storie1/">http://birding.about.com/od/storie1/</a>	02/02/2005 14:22:38	birding.about.com	Bird Stories and Tales	46
<a href="http://z.about.com/5/ad/am.htm?pid=about">http://z.about.com/5/ad/am.htm?pid=about</a>	02/02/2005 14:22:45	z.about.com	Audience Match Data Agent	54
<a href="http://z.about.com/6/o/.htm?gs=birding">http://z.about.com/6/o/.htm?gs=birding</a>	02/02/2005 14:22:45	z.about.com	Current Headlines	53
<a href="http://n479ad.doubleclick.net/adi/ab.hobbies/hobbies_birding;svc=s;site=birding;t=14;pcc=1;fd=0;fs=0;a=;bjp=pid512;kw=;chan=hobbies;syn=ab...">http://n479ad.doubleclick.net/adi/ab.hobbies/hobbies_birding;svc=s;site=birding;t=14;pcc=1;fd=0;fs=0;a=;bjp=pid512;kw=;chan=hobbies;syn=ab...</a>	02/02/2005 14:22:45	n479ad.doubleclick...	Click Here!	52
<a href="http://z.about.com/7/o/cw.htm?gs=birding">http://z.about.com/7/o/cw.htm?gs=birding</a>	02/02/2005 14:23:04	z.about.com		57
<a href="http://n479ad.doubleclick.net/5/o/c.htm?gs=birding">http://n479ad.doubleclick.net/5/o/c.htm?gs=birding</a>	02/02/2005 14:23:04	z.about.com	Related Articles	58
<a href="http://n479ad.doubleclick.net/adi/ab.hobbies/hobbies_birding;svc=s;site=birding;t=0;pcc=2;fd=0;fs=0;a=;bjp=pid512;kw=;chan=hobbies;syn=ab...">http://n479ad.doubleclick.net/adi/ab.hobbies/hobbies_birding;svc=s;site=birding;t=0;pcc=2;fd=0;fs=0;a=;bjp=pid512;kw=;chan=hobbies;syn=ab...</a>	02/02/2005 14:23:04	n479ad.doubleclick...	Click Here!	60
<a href="http://n479ad.doubleclick.net/adi/ab.hobbies/hobbies_birding;svc=s;site=birding;t=0;pcc=2;fd=0;fs=0;a=;bjp=pid512;kw=;chan=hobbies;syn=ab...">http://n479ad.doubleclick.net/adi/ab.hobbies/hobbies_birding;svc=s;site=birding;t=0;pcc=2;fd=0;fs=0;a=;bjp=pid512;kw=;chan=hobbies;syn=ab...</a>	02/02/2005 14:23:04	n479ad.doubleclick...	Click Here!	59
<a href="http://n479ad.doubleclick.net/adi/ab.hobbies/hobbies_birding;svc=s;site=birding;t=0;pcc=2;fd=0;fs=0;a=;bjp=pid512;kw=;chan=hobbies;syn=ab...">http://n479ad.doubleclick.net/adi/ab.hobbies/hobbies_birding;svc=s;site=birding;t=0;pcc=2;fd=0;fs=0;a=;bjp=pid512;kw=;chan=hobbies;syn=ab...</a>	02/02/2005 14:23:04	n479ad.doubleclick...	Click Here!	56
<a href="http://birding.about.com/library/weekly/aa102598.htm">http://birding.about.com/library/weekly/aa102598.htm</a>	02/02/2005 14:23:04	birding.about.com	Wings of Terror - avian humor article for people interesting ...	55
<a href="http://n479ad.doubleclick.net/adi/ab.hobbies/hobbies_birding;svc=s;site=birding;t=0;pcc=3;fd=0;fs=0;a=;bjp=pid512;kw=;chan=hobbies;syn=ab...">http://n479ad.doubleclick.net/adi/ab.hobbies/hobbies_birding;svc=s;site=birding;t=0;pcc=3;fd=0;fs=0;a=;bjp=pid512;kw=;chan=hobbies;syn=ab...</a>	02/02/2005 14:23:04	n479ad.doubleclick...	Click Here!	65
<a href="http://n479ad.doubleclick.net/adi/ab.hobbies/hobbies_birding;svc=s;site=birding;t=0;pcc=3;fd=0;fs=0;a=;bjp=pid512;kw=;chan=hobbies;syn=ab...">http://n479ad.doubleclick.net/adi/ab.hobbies/hobbies_birding;svc=s;site=birding;t=0;pcc=3;fd=0;fs=0;a=;bjp=pid512;kw=;chan=hobbies;syn=ab...</a>	02/02/2005 14:23:04	n479ad.doubleclick...	Click Here!	64
<a href="http://n479ad.doubleclick.net/adi/ab.hobbies/hobbies_birding;svc=s;site=birding;t=0;pcc=3;fd=0;fs=0;a=;bjp=pid512;kw=;chan=hobbies;syn=ab...">http://n479ad.doubleclick.net/adi/ab.hobbies/hobbies_birding;svc=s;site=birding;t=0;pcc=3;fd=0;fs=0;a=;bjp=pid512;kw=;chan=hobbies;syn=ab...</a>	02/02/2005 14:23:04	n479ad.doubleclick...	Click Here!	63
<a href="http://clk.about.com/?zis:18/y/8sdn+hobbies_birding&amp;itm=518&amp;d=00&amp;su=p512.6.140.ip_&amp;ttt=0&amp;zsu=http%3A//birding.about.com/...">http://clk.about.com/?zis:18/y/8sdn+hobbies_birding&amp;itm=518&amp;d=00&amp;su=p512.6.140.ip_&amp;ttt=0&amp;zsu=http%3A//birding.about.com/...</a>	02/02/2005 14:23:56	clk.about.com		61
<a href="http://birding.about.com/library/alphatypeofbird.htm">http://birding.about.com/library/alphatypeofbird.htm</a>	02/02/2005 14:23:56	birding.about.com	Alphabetical Index of Birds	62
<a href="http://n479ad.doubleclick.net/adi/ab.hobbies/hobbies_birding;svc=s;site=birding;t=0;pcc=4;fd=0;fs=0;a=;bjp=pid512;kw=;chan=hobbies;syn=ab...">http://n479ad.doubleclick.net/adi/ab.hobbies/hobbies_birding;svc=s;site=birding;t=0;pcc=4;fd=0;fs=0;a=;bjp=pid512;kw=;chan=hobbies;syn=ab...</a>	02/02/2005 14:24:18	n479ad.doubleclick...	Click Here!	70
<a href="http://n479ad.doubleclick.net/adi/ab.hobbies/hobbies_birding;svc=s;site=birding;t=0;pcc=4;fd=0;fs=0;a=;bjp=pid512;kw=;chan=hobbies;syn=ab...">http://n479ad.doubleclick.net/adi/ab.hobbies/hobbies_birding;svc=s;site=birding;t=0;pcc=4;fd=0;fs=0;a=;bjp=pid512;kw=;chan=hobbies;syn=ab...</a>	02/02/2005 14:24:18	n479ad.doubleclick...	Click Here!	69
<a href="http://n479ad.doubleclick.net/adi/ab.hobbies/hobbies_birding;svc=s;site=birding;t=0;pcc=4;fd=0;fs=0;a=;bjp=pid512;kw=;chan=hobbies;syn=ab...">http://n479ad.doubleclick.net/adi/ab.hobbies/hobbies_birding;svc=s;site=birding;t=0;pcc=4;fd=0;fs=0;a=;bjp=pid512;kw=;chan=hobbies;syn=ab...</a>	02/02/2005 14:24:18	n479ad.doubleclick...	Click Here!	68
<a href="http://clk.about.com/?zis:18/y/8sdn+hobbies_birding&amp;itm=208&amp;d=00&amp;su=p512.6.140.ip_&amp;ttt=0&amp;zsu=http%3A//birding.about.com/...">http://clk.about.com/?zis:18/y/8sdn+hobbies_birding&amp;itm=208&amp;d=00&amp;su=p512.6.140.ip_&amp;ttt=0&amp;zsu=http%3A//birding.about.com/...</a>	02/02/2005 14:24:18	clk.about.com		66
<a href="http://birding.about.com/library/bilhouseplans.htm">http://birding.about.com/library/bilhouseplans.htm</a>	02/02/2005 14:24:18	birding.about.com	Specs for Building Birdhouses and for use in Bird House Plans	67
<a href="http://n479ad.doubleclick.net/adi/ab.hobbies/hobbies_birding;svc=s;site=birding;t=0;pcc=5;fd=0;fs=0;a=;bjp=pid512;kw=;chan=hobbies;syn=ab...">http://n479ad.doubleclick.net/adi/ab.hobbies/hobbies_birding;svc=s;site=birding;t=0;pcc=5;fd=0;fs=0;a=;bjp=pid512;kw=;chan=hobbies;syn=ab...</a>	02/02/2005 14:24:32	n479ad.doubleclick...	Click Here!	75
<a href="http://n479ad.doubleclick.net/adi/ab.hobbies/hobbies_birding;svc=s;site=birding;t=0;pcc=5;fd=0;fs=0;a=;bjp=pid512;kw=;chan=hobbies;syn=ab...">http://n479ad.doubleclick.net/adi/ab.hobbies/hobbies_birding;svc=s;site=birding;t=0;pcc=5;fd=0;fs=0;a=;bjp=pid512;kw=;chan=hobbies;syn=ab...</a>	02/02/2005 14:24:32	n479ad.doubleclick...	Click Here!	74
<a href="http://n479ad.doubleclick.net/adi/ab.hobbies/hobbies_birding;svc=s;site=birding;t=0;pcc=5;fd=0;fs=0;a=;bjp=pid512;kw=;chan=hobbies;syn=ab...">http://n479ad.doubleclick.net/adi/ab.hobbies/hobbies_birding;svc=s;site=birding;t=0;pcc=5;fd=0;fs=0;a=;bjp=pid512;kw=;chan=hobbies;syn=ab...</a>	02/02/2005 14:24:32	n479ad.doubleclick...	Click Here!	73
<a href="http://birding.about.com/od/buildhouses/">http://birding.about.com/od/buildhouses/</a>	02/02/2005 14:24:32	birding.about.com	How to Build Bird Houses and Nest Boxes	72
<a href="http://birding.about.com/cs/buildhouses/index.htm">http://birding.about.com/cs/buildhouses/index.htm</a>	02/02/2005 14:24:32	birding.about.com		71
<a href="http://view.atmdm.com/VONL/iview/btcvmn026000015von/direct/01click=http://n479ad.doubleclick.net/click%3Bhv=v d 21 3 0 0%2a q%3B120...">http://view.atmdm.com/VONL/iview/btcvmn026000015von/direct/01click=http://n479ad.doubleclick.net/click%3Bhv=v d 21 3 0 0%2a q%3B120...</a>	02/02/2005 14:24:42	atmdm.com	vonage_vpart_gothrubiz_336	80
<a href="http://n479ad.doubleclick.net/adi/ab.hobbies/hobbies_birding;svc=s;site=birding;t=2;pcc=6;fd=0;fs=0;a=;bjp=pid512;kw=;chan=hobbies;syn=ab...">http://n479ad.doubleclick.net/adi/ab.hobbies/hobbies_birding;svc=s;site=birding;t=2;pcc=6;fd=0;fs=0;a=;bjp=pid512;kw=;chan=hobbies;syn=ab...</a>	02/02/2005 14:24:42	n479ad.doubleclick...	Click Here!	78
<a href="http://n479ad.doubleclick.net/adi/ab.hobbies/hobbies_birding;svc=s;site=birding;t=2;pcc=6;fd=0;fs=0;a=;bjp=pid512;kw=;chan=hobbies;syn=ab...">http://n479ad.doubleclick.net/adi/ab.hobbies/hobbies_birding;svc=s;site=birding;t=2;pcc=6;fd=0;fs=0;a=;bjp=pid512;kw=;chan=hobbies;syn=ab...</a>	02/02/2005 14:24:42	n479ad.doubleclick...	Click Here!	77
<a href="http://n479ad.doubleclick.net/adi/ab.hobbies/hobbies_birding;svc=s;site=birding;t=2;pcc=6;fd=0;fs=0;a=;bjp=pid512;kw=;chan=hobbies;syn=ab...">http://n479ad.doubleclick.net/adi/ab.hobbies/hobbies_birding;svc=s;site=birding;t=2;pcc=6;fd=0;fs=0;a=;bjp=pid512;kw=;chan=hobbies;syn=ab...</a>	02/02/2005 14:24:42	n479ad.doubleclick...	Click Here!	79
<a href="http://birding.about.com/cs/birdhousefeeder/a/buildindex.htm">http://birding.about.com/cs/birdhousefeeder/a/buildindex.htm</a>	02/02/2005 14:24:42	birding.about.com	Free Feeder and Birdhouse Plans Index	76
<a href="http://n479ad.doubleclick.net/adi/ab.hobbies/hobbies_birding;svc=s;site=birding;t=0;pcc=7;fd=0;fs=0;a=;bjp=pid512;kw=;chan=hobbies;syn=ab...">http://n479ad.doubleclick.net/adi/ab.hobbies/hobbies_birding;svc=s;site=birding;t=0;pcc=7;fd=0;fs=0;a=;bjp=pid512;kw=;chan=hobbies;syn=ab...</a>	02/02/2005 14:24:55	n479ad.doubleclick...	Click Here!	84
<a href="http://n479ad.doubleclick.net/adi/ab.hobbies/hobbies_birding;svc=s;site=birding;t=0;pcc=7;fd=0;fs=0;a=;bjp=pid512;kw=;chan=hobbies;syn=ab...">http://n479ad.doubleclick.net/adi/ab.hobbies/hobbies_birding;svc=s;site=birding;t=0;pcc=7;fd=0;fs=0;a=;bjp=pid512;kw=;chan=hobbies;syn=ab...</a>	02/02/2005 14:24:55	n479ad.doubleclick...	Click Here!	83
<a href="http://n479ad.doubleclick.net/adi/ab.hobbies/hobbies_birding;svc=s;site=birding;t=0;pcc=7;fd=0;fs=0;a=;bjp=pid512;kw=;chan=hobbies;syn=ab...">http://n479ad.doubleclick.net/adi/ab.hobbies/hobbies_birding;svc=s;site=birding;t=0;pcc=7;fd=0;fs=0;a=;bjp=pid512;kw=;chan=hobbies;syn=ab...</a>	02/02/2005 14:24:55	n479ad.doubleclick...	Click Here!	82
<a href="http://birding.about.com/library/weekly/aa010703a.htm">http://birding.about.com/library/weekly/aa010703a.htm</a>	02/02/2005 14:24:55	birding.about.com	Birding and Birdwatching - Build a Bluebird Nest Box for W...	81
<a href="http://n479ad.doubleclick.net/adi/ab.hobbies/hobbies_birding;svc=s;site=birding;t=0;pcc=8;fd=0;fs=0;a=;bjp=pid512;kw=;chan=hobbies;syn=ab...">http://n479ad.doubleclick.net/adi/ab.hobbies/hobbies_birding;svc=s;site=birding;t=0;pcc=8;fd=0;fs=0;a=;bjp=pid512;kw=;chan=hobbies;syn=ab...</a>	02/02/2005 14:26:43	n479ad.doubleclick...	Click Here!	89
<a href="http://n479ad.doubleclick.net/adi/ab.hobbies/hobbies_birding;svc=s;site=birding;t=0;pcc=8;fd=0;fs=0;a=;bjp=pid512;kw=;chan=hobbies;syn=ab...">http://n479ad.doubleclick.net/adi/ab.hobbies/hobbies_birding;svc=s;site=birding;t=0;pcc=8;fd=0;fs=0;a=;bjp=pid512;kw=;chan=hobbies;syn=ab...</a>	02/02/2005 14:26:43	n479ad.doubleclick...	Click Here!	88
<a href="http://n479ad.doubleclick.net/adi/ab.hobbies/hobbies_birding;svc=s;site=birding;t=0;pcc=8;fd=0;fs=0;a=;bjp=pid512;kw=;chan=hobbies;syn=ab...">http://n479ad.doubleclick.net/adi/ab.hobbies/hobbies_birding;svc=s;site=birding;t=0;pcc=8;fd=0;fs=0;a=;bjp=pid512;kw=;chan=hobbies;syn=ab...</a>	02/02/2005 14:26:43	n479ad.doubleclick...	Click Here!	87
<a href="http://clk.about.com/?zis:18/y/W&amp;sdn=hobbies_birding&amp;itm=107&amp;d=00&amp;su=p512.6.140.ip_&amp;ttt=0&amp;zsu=http%3A//birding.about.com/...">http://clk.about.com/?zis:18/y/W&amp;sdn=hobbies_birding&amp;itm=107&amp;d=00&amp;su=p512.6.140.ip_&amp;ttt=0&amp;zsu=http%3A//birding.about.com/...</a>	02/02/2005 14:26:43	clk.about.com		85
<a href="http://birding.about.com/library/birdhousefeederpaint.htm">http://birding.about.com/library/birdhousefeederpaint.htm</a>	02/02/2005 14:26:43	birding.about.com	Birding and Birdwatching - Painting or Staining Bird Houses...	86

### 7.1.14.7 Haiths bird food

<a href="http://www.haiths.com/">http://www.haiths.com/</a>	02/02/2005 14:27:07	haiths.com	Haith's Wild Bird Foods & Bill Oddie's tips and advice also b...
<a href="http://www.haiths.com/Features.asp?lookup=0&amp;brand=1&amp;article_id=features_1&amp;customer_id=PAA0219022305524FFFKSRZKXZGRWU">http://www.haiths.com/Features.asp?lookup=0&amp;brand=1&amp;article_id=features_1&amp;customer_id=PAA0219022305524FFFKSRZKXZGRWU</a>	02/02/2005 14:28:31	haiths.com	Haith's Wild Bird Foods & Bill Oddie's tips and advice also b...

### 7.1.14.8 The birds 1953 movie

<a href="http://www.imdb.com/title/tt0056869/">http://www.imdb.com/title/tt0056869/</a>	02/02/2005 14:40:24	imdb.com	The Birds 1963
<a href="http://www.imdb.com/google/box?num=3&amp;key=power100-withsc;placement=midbucket;rnd=45504;sid=7845;referer=%2Ftitle%2Ftt0056869%2F;sl...">http://www.imdb.com/google/box?num=3&amp;key=power100-withsc;placement=midbucket;rnd=45504;sid=7845;referer=%2Ftitle%2Ftt0056869%2F;sl...</a>	02/02/2005 14:40:30	imdb.com	
<a href="http://www.imdb.com/title/tt0056869/trailers">http://www.imdb.com/title/tt0056869/trailers</a>	02/02/2005 14:40:46	imdb.com	Trailers for The Birds 1963
<a href="http://www.imdb.com/rg/title-tease/trailers/title/tt0056869/trailers">http://www.imdb.com/rg/title-tease/trailers/title/tt0056869/trailers</a>	02/02/2005 14:40:46	imdb.com	
<a href="http://www.imdb.com/google/box?num=3&amp;key=power100-withsc;placement=midbucket;rnd=83932;sid=8055;referer=%2Ftitle%2Ftt0056869%2Ftrai...">http://www.imdb.com/google/box?num=3&amp;key=power100-withsc;placement=midbucket;rnd=83932;sid=8055;referer=%2Ftitle%2Ftt0056869%2Ftrai...</a>	02/02/2005 14:40:46	imdb.com	

### 7.1.14.10 Pbs.org two bird audios

<a href="http://www.pbs.org/lifeofbirds/songs/kakapo.ram">http://www.pbs.org/lifeofbirds/songs/kakapo.ram</a>	02/02/2005 15:11:41	pbs.org
<a href="http://www.pbs.org/lifeofbirds/songs/dawn.ram">http://www.pbs.org/lifeofbirds/songs/dawn.ram</a>	02/02/2005 15:12:06	pbs.org

### 7.1.14.10 GnuPG and winpt.org

<a href="http://www.google.co.uk/search?q=windows+gnupg&amp;sourceid=mozilla-search&amp;start=0&amp;start=0&amp;ie=utf-8&amp;oe=utf-8&amp;client=firefox-a&amp;rls=org.mozilla%3Aen-GB%3Aofficial&amp;start=10&amp;sa=N">http://www.google.co.uk/search?q=windows+gnupg&amp;sourceid=mozilla-search&amp;start=0&amp;start=0&amp;ie=utf-8&amp;oe=utf-8&amp;client=firefox-a&amp;rls=org.mozilla%3Aen-GB%3Aofficial&amp;start=10&amp;sa=N</a>	02/02/2005 15:57:40	google.co.uk	Google Search: windows gnupg
<a href="http://www.gnupg.org/download/">http://www.gnupg.org/download/</a>	02/02/2005 15:57:51	gnupg.org	Download - GnuPG.org
<a href="http://www.gnupg.org/download.html">http://www.gnupg.org/download.html</a>	02/02/2005 15:57:51	gnupg.org	
<a href="http://www.winpt.org/">http://www.winpt.org/</a>	02/02/2005 15:58:23	winpt.org	WinPT
<a href="http://www.stud.uni-hannover.de/~twoaday/winpt.html">http://www.stud.uni-hannover.de/~twoaday/winpt.html</a>	02/02/2005 15:58:23	stud.uni-hannover...	
<a href="http://www.google.co.uk/search?q=windows+gnupg&amp;hl=en&amp;lr=&amp;client=firefox-a&amp;rls=org.mozilla:en-GB:official&amp;start=10&amp;sa=N">http://www.google.co.uk/search?q=windows+gnupg&amp;hl=en&amp;lr=&amp;client=firefox-a&amp;rls=org.mozilla:en-GB:official&amp;start=10&amp;sa=N</a>	02/02/2005 15:58:48	google.co.uk	Google Search: windows gnupg
<a href="http://openpgp.vie-privee.org/wingpg.html">http://openpgp.vie-privee.org/wingpg.html</a>	02/02/2005 15:58:58	openpgp.vie-prive...	GnuPG Windows

### 7.1.14.11 Wayback machine for winpt.org

http://www.stud.uni-hannover.de/~twoaday/winpt.html

185 captures

13 Apr 2004 - 9 Feb 2021

## Windows Privacy Tray

WinPT is a taskbar front-end for GnuPG which includes key management, encryption via the clipboard and/or direct file encryption and support for OpenPGP smartcards.

### Windows Privacy Tray

latest testing version [0.11.7 signature](#)  
source code for version [0.11.7 signature](#) (527k)  
[GPG4WIN](#) graphical [installer](#) with WinPT and GPG [signature](#)  
alternative [download](#) site at Gforge  
latest German translation [file](#) (2006-01-27)

New project site available [here](#)

[Screenshots](#)

[Mailing lists](#)

[Bug tracker](#)

[OpenPGP Smartcard](#)

**Important Note:** The WinPT version included in the SourceForge Windows Privacy Tools installer is obsolete and should not be used.

### 7.1.14.12 Bird mating calls search and whyfiles.org

① <a href="http://www.google.co.uk/search?client=firefox-a&amp;rls=org.mozilla%3Aen-GB%3Aofficial_s&amp;hl=en&amp;q=bird+mating+calls&amp;meta=&amp;btnG=Google...">http://www.google.co.uk/search?client=firefox-a&amp;rls=org.mozilla%3Aen-GB%3Aofficial_s&amp;hl=en&amp;q=bird+mating+calls&amp;meta=&amp;btnG=Google...</a>	03/02/2005 12:21:40	Google Search: bird mating calls	141
② <a href="http://whyfiles.org/shorties/104chick_sex/">http://whyfiles.org/shorties/104chick_sex/</a>	03/02/2005 12:21:56	whyfiles.org	142

### 7.1.14.13 Wayback machine for whyfiles.org

[http://whyfiles.org/shorties/104chick\\_sex/](http://whyfiles.org/shorties/104chick_sex/)

Go

49 captures

19 Oct 2002 - 30 Nov 2021

No. The takeaway message for the ladies is: "I married a loser!"



Sounds courtesy  
Daniel Mennill:



Aggressive  
song



Submissive  
song



Chickadee  
call

And then they step outside the nest for some quick action with another guy! In evolutionary terms, that would guarantee that at least some of her young get top-notch genes.

#### The day I lost my baby

This, in short, is the message of a new study by Daniel Mennill and colleagues at Queen's University, Kingston, Ontario. Mennill, a graduate student, is interested in how animals make decisions, and especially how birds communicate during mating. Instead of looking just at two parties, however, he's checking the network thing -- how, say, a third party interprets communication between two others.

He calls it eavesdropping, since the females overhear the "conversations" of others.

Mennill studied wild-living black-capped chickadees at the Queen's University biological station and identified high- and low-status males. As with people, upper-crust chickadees skim off the cream, so to speak. "At a food source... everybody makes way for the highest ranking bird," he says.

#### Sing me softly of the blues

Male songs during mating season can be submissive or aggressive, Mennill says. [Aggressive songs](#) copy the pitch of the other guy's song.

In contrast, a [submissive song](#) uses a different pitch, giving the first songster some breathing room..

During mating season, Mennill hung out in the woods with a laptop and a speaker. He gathered the birds by playing the familiar [chickadee call](#).

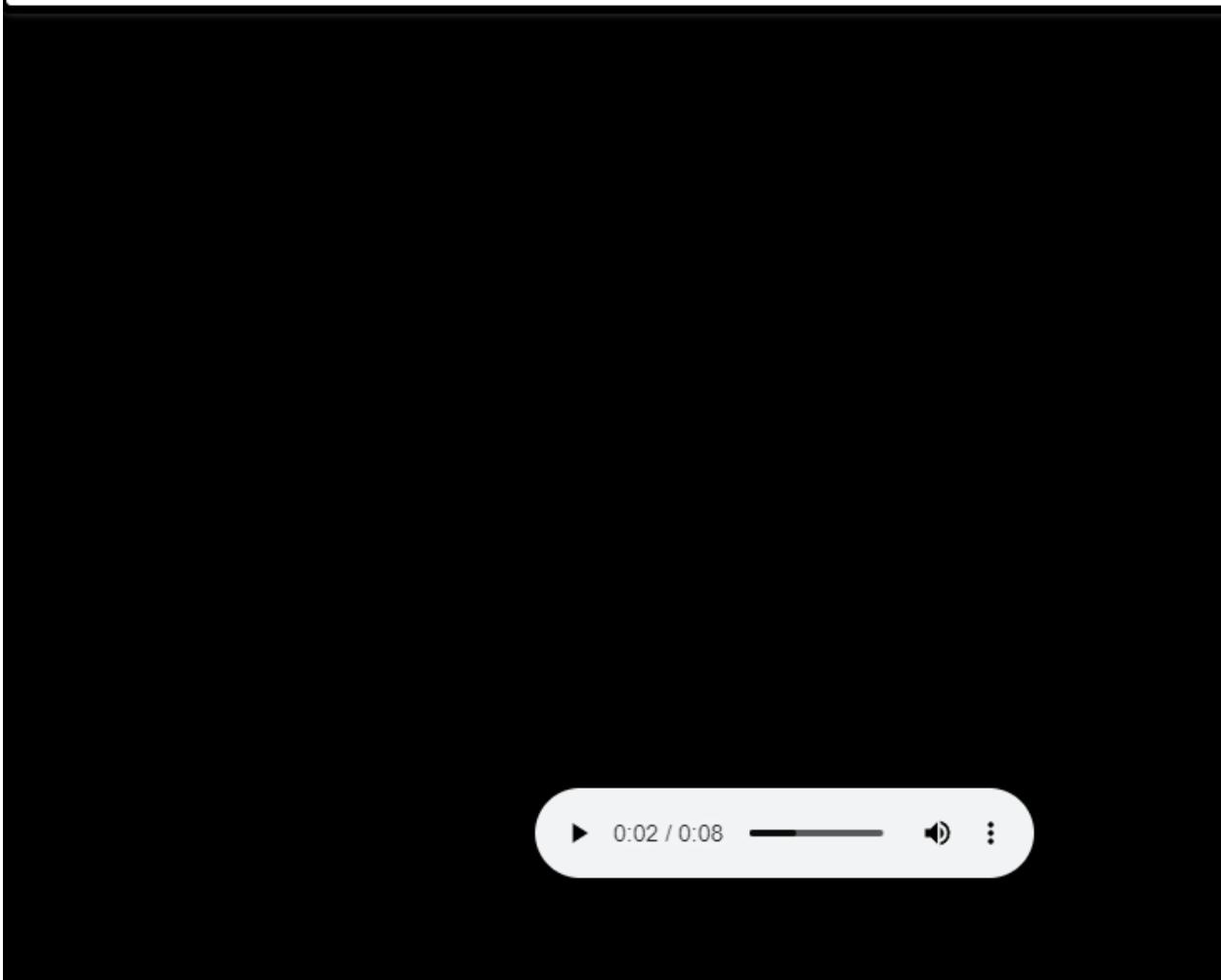
#### **7.1.14.14 Aggressive\_song.wav**

[http://whyfiles.org/shorties/104chick\\_sex/images/aggressive\\_song.wav](http://whyfiles.org/shorties/104chick_sex/images/aggressive_song.wav)

Go

[4 captures](#)

23 Oct 2007 - 24 Mar 2017



#### **7.1.14.15 Young chicks google images search**

⌚ [http://images.google.co.uk/images?client=firefox-a&rls=org.mozilla%3Aen-GB%3Aofficial\\_s&q=young+chicks&hl=en&btnG=Google+Search](http://images.google.co.uk/images?client=firefox-a&rls=org.mozilla%3Aen-GB%3Aofficial_s&q=young+chicks&hl=en&btnG=Google+Search) 03/02/2005 14:59:40 images.google.co.... Google Search: young chicks

#### **7.1.14.16 Wayback machine for young chicks site**

[HOME](#)
[STORIES](#)

A nest of very young chicks and eggs

There are three very young chicks in this picture, and the eldest and biggest is Scottie Pine -- marked by arrows. --

The right arrow points to his body, and the left to his head -- the chicks do like to get into a scrum, and it is hard to sort out who owns which body parts!

The same nest a week or so later

Again, the arrow points to Scottie, who, in his third week of life, is becoming recognizable -- and much prettier! His head is turned to his left, and his right wing is stretched out over his tiny sister who has her back to the camera.

You can see the open eyes of both older chicks.

© Helen Day, first published 2003.

### 7.1.14.17 Several URLs

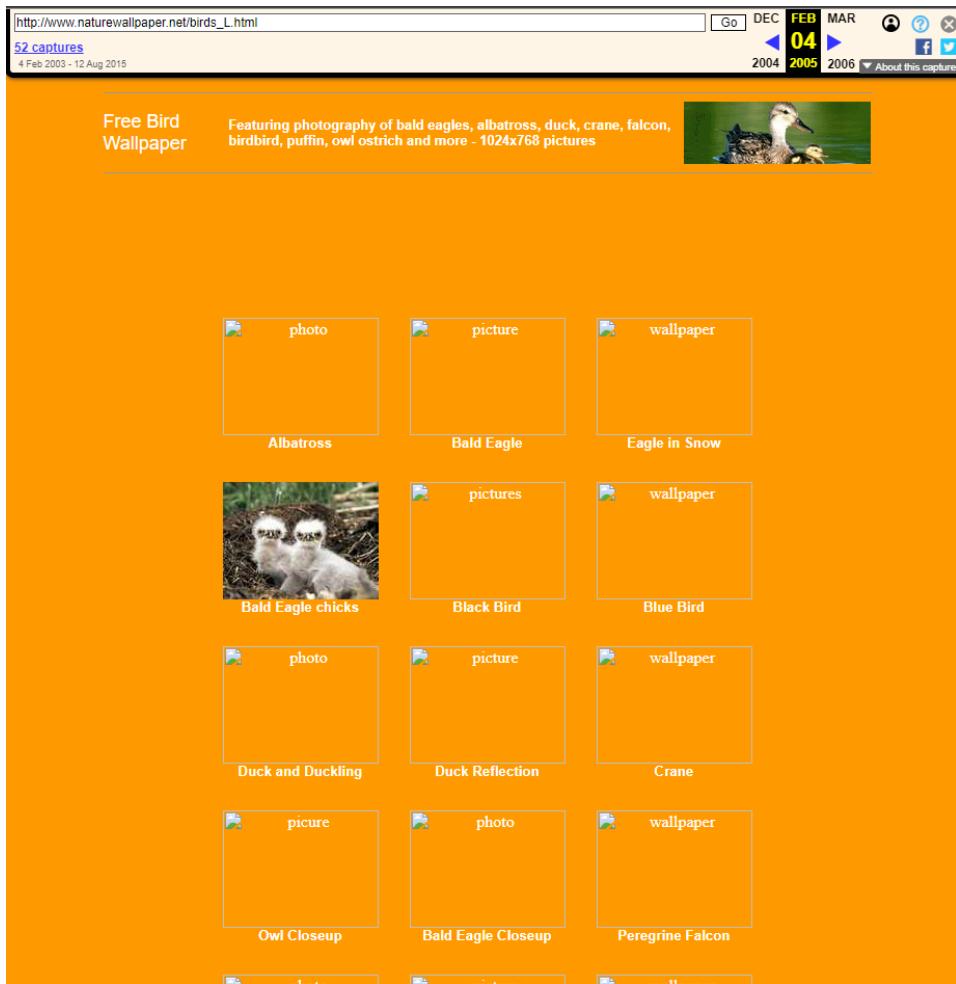
⑤ <a href="http://www.google.co.uk/search?client=firefox-a&amp;tts=org.mozilla%3Aen-GB%3Aofficial_s&amp;hl=en&amp;q=bird+mating+calls&amp;meta=&amp;bttnG=Google+Search">http://www.google.co.uk/search?client=firefox-a&amp;tts=org.mozilla%3Aen-GB%3Aofficial_s&amp;hl=en&amp;q=bird+mating+calls&amp;meta=&amp;bttnG=Google+Search</a>	03/02/2005 12:21:40	Google Search: bird mating calls	141
⑤ <a href="http://whyfiles.org/shorties/104chick_se/">http://whyfiles.org/shorties/104chick_se/</a>	03/02/2005 12:21:56	whyfiles.org	142
⑤ <a href="http://www.google.co.uk/search?client=firefox-a&amp;tts=org.mozilla%3Aen-GB%3Aofficial_s&amp;hl=en&amp;q=young+chicks&amp;hl=en&amp;bttnG=Google+Search">http://www.google.co.uk/search?client=firefox-a&amp;tts=org.mozilla%3Aen-GB%3Aofficial_s&amp;hl=en&amp;q=young+chicks&amp;hl=en&amp;bttnG=Google+Search</a>	03/02/2005 14:59:40	Google Image Search	143
⑤ <a href="http://images.google.co.uk/imgres?imgurl=http://freespace.virgin.net/cobber/budgies/images/babycot_yeung.jpg&amp;imgrefurl=http://freespace.virgin.net/cobber/budgies/stories/scottie_a.html&amp;h=353&amp;w=350&amp;sz=38&amp;t...">http://images.google.co.uk/imgres?imgurl=http://freespace.virgin.net/cobber/budgies/images/babycot_yeung.jpg&amp;imgrefurl=http://freespace.virgin.net/cobber/budgies/stories/scottie_a.html&amp;h=353&amp;w=350&amp;sz=38&amp;t...</a>	03/02/2005 14:59:56	images.google.co...	144
⑤ <a href="http://freespace.virgin.net/cobber/budgies/stories/scottie_a.htm">http://freespace.virgin.net/cobber/budgies/stories/scottie_a.htm</a>	03/02/2005 14:59:56	Google Image Result for http://freespace.virgin.net/cobber...	145
⑤ <a href="http://images.google.co.uk/imgres?imgurl=http://www.insaneanimals.com/items/177.jpg&amp;imgrefurl=http://www.insaneanimals.com/funny-animals/177.html%3Fsort%3Ddate&amp;h=290&amp;w=350&amp;sz=10&amp;tbnid=975A3_pw&amp;...">http://images.google.co.uk/imgres?imgurl=http://www.insaneanimals.com/items/177.jpg&amp;imgrefurl=http://www.insaneanimals.com/funny-animals/177.html%3Fsort%3Ddate&amp;h=290&amp;w=350&amp;sz=10&amp;tbnid=975A3_pw&amp;...</a>	03/02/2005 15:01:02	Scottie's Baby Pictures - 1	146
⑤ <a href="http://images.google.co.uk/imgres?imgurl=http://www.insaneanimals.com/items/177.jpg&amp;imgrefurl=http://www.insaneanimals.com/funny-animals/177.html%3Fsort%3Ddate&amp;h=290&amp;w=350&amp;sz=10&amp;tbnid=975A3_pw&amp;...">http://images.google.co.uk/imgres?imgurl=http://www.insaneanimals.com/items/177.jpg&amp;imgrefurl=http://www.insaneanimals.com/funny-animals/177.html%3Fsort%3Ddate&amp;h=290&amp;w=350&amp;sz=10&amp;tbnid=975A3_pw&amp;...</a>	03/02/2005 15:01:02	Google Image Result for http://www.insaneanimals.com/ite...	147
⑤ <a href="http://www.insaneanimals.com/items/177.jpg&amp;imgrefurl=http://www.insaneanimals.com/funny-animals/177.html%3Fsort%3Ddate&amp;h=290&amp;w=350&amp;sz=10&amp;tbnid=975A3_pw&amp;...">http://www.insaneanimals.com/items/177.jpg&amp;imgrefurl=http://www.insaneanimals.com/funny-animals/177.html%3Fsort%3Ddate&amp;h=290&amp;w=350&amp;sz=10&amp;tbnid=975A3_pw&amp;...</a>	03/02/2005 15:01:02	freespace.virgin.net	148
⑤ <a href="http://www.insaneanimals.com/items/177.jpg&amp;imgrefurl=http://www.insaneanimals.com/funny-animals/177.html%3Fsort%3Ddate&amp;h=290&amp;w=350&amp;sz=10&amp;tbnid=975A3_pw&amp;...">http://www.insaneanimals.com/items/177.jpg&amp;imgrefurl=http://www.insaneanimals.com/funny-animals/177.html%3Fsort%3Ddate&amp;h=290&amp;w=350&amp;sz=10&amp;tbnid=975A3_pw&amp;...</a>	03/02/2005 15:01:02	Google Image Result for http://www.insaneanimals.com/ite...	149
⑤ <a href="http://www.insaneanimals.com/items/177.jpg&amp;imgrefurl=http://www.insaneanimals.com/funny-animals/177.html%3Fsort%3Ddate&amp;h=290&amp;w=350&amp;sz=10&amp;tbnid=975A3_pw&amp;...">http://www.insaneanimals.com/items/177.jpg&amp;imgrefurl=http://www.insaneanimals.com/funny-animals/177.html%3Fsort%3Ddate&amp;h=290&amp;w=350&amp;sz=10&amp;tbnid=975A3_pw&amp;...</a>	03/02/2005 15:01:02	insaneanimals.com	150
⑤ <a href="http://media.fastrclick.net/w/get_media.php?id=13470&amp;m=3&amp;v=1&amp;c=1708&amp;n=11074287773&amp;format=120&amp;h=600_a&amp;output=html&amp;url=http%3A//images.google.co.uk/imgres%3Fimgurl%3Dhttp%3A//www.insaneanimals.com/items/177.jpg%26imgrefurl%3Dhttp%3A//...">http://media.fastrclick.net/w/get_media.php?id=13470&amp;m=3&amp;v=1&amp;c=1708&amp;n=11074287773&amp;format=120&amp;h=600_a&amp;output=html&amp;url=http%3A//images.google.co.uk/imgres%3Fimgurl%3Dhttp%3A//www.insaneanimals.com/items/177.jpg%26imgrefurl%3Dhttp%3A//...</a>	03/02/2005 15:01:17	Young Chicks - Funny Animals, Pets, Cats and Dogs Picture...	151
⑤ <a href="http://pagead2.googlesyndication.com/pagead/client/ca-pub-20666032911329&amp;utd=11074287773&amp;format=120&amp;h=600_a&amp;output=html&amp;url=http%3A//...">http://pagead2.googlesyndication.com/pagead/client/ca-pub-20666032911329&amp;utd=11074287773&amp;format=120&amp;h=600_a&amp;output=html&amp;url=http%3A//...</a>	03/02/2005 15:01:53	152	
⑤ <a href="http://images.google.co.uk/imgres?imgurl=http://www.cvm.okstate.edu/instruction/kocan/desk2/images/img056.jpg&amp;imgrefurl=http://www.cvm.okstate.edu/instruction/kocan/desk2/images/img056.jpg&amp;imgrefurl=http://www.cvm.okstate.edu/instruction/kocan/desk2/...">http://images.google.co.uk/imgres?imgurl=http://www.cvm.okstate.edu/instruction/kocan/desk2/images/img056.jpg&amp;imgrefurl=http://www.cvm.okstate.edu/instruction/kocan/desk2/...</a>	03/02/2005 15:02:01	Google Image Result for http://www.cvm.okstate.edu/instr...	153
⑤ <a href="http://images.google.co.uk/imgres?imgurl=http://www.cvm.okstate.edu/instruction/kocan/desk2/images/img056.jpg&amp;imgrefurl=http://www.cvm.okstate.edu/instruction/kocan/desk2/...">http://images.google.co.uk/imgres?imgurl=http://www.cvm.okstate.edu/instruction/kocan/desk2/images/img056.jpg&amp;imgrefurl=http://www.cvm.okstate.edu/instruction/kocan/desk2/...</a>	03/02/2005 15:02:14	cvm.okstate.edu	154
⑤ <a href="http://www.cvm.okstate.edu/instruction/kocan/ostrich/b2.htm">http://www.cvm.okstate.edu/instruction/kocan/ostrich/b2.htm</a>	03/02/2005 15:02:32	155	
⑤ <a href="http://images.google.co.uk/imgres?imgurl=http://people.cornell.edu/pages/sah67/chick2.jpg&amp;imgrefurl=http://people.cornell.edu/pages/sah67/summer.html&amp;h=450&amp;w=600&amp;sz=39&amp;tbnid=75ZWO4eGCbY1&amp;tbm=...">http://images.google.co.uk/imgres?imgurl=http://people.cornell.edu/pages/sah67/chick2.jpg&amp;imgrefurl=http://people.cornell.edu/pages/sah67/summer.html&amp;h=450&amp;w=600&amp;sz=39&amp;tbnid=75ZWO4eGCbY1&amp;tbm=...</a>	03/02/2005 15:03:44	Google Image Result for http://people.cornell.edu/pages/sa...	156
⑤ <a href="http://images.google.co.uk/imgres?imgurl=http://people.cornell.edu/pages/sah67/chick2.jpg&amp;imgrefurl=http://people.cornell.edu/pages/sah67/summer.html&amp;h=450&amp;w=600&amp;sz=39&amp;tbnid=75ZWO4eGCbY1&amp;tbm=...">http://images.google.co.uk/imgres?imgurl=http://people.cornell.edu/pages/sah67/chick2.jpg&amp;imgrefurl=http://people.cornell.edu/pages/sah67/summer.html&amp;h=450&amp;w=600&amp;sz=39&amp;tbnid=75ZWO4eGCbY1&amp;tbm=...</a>	03/02/2005 15:03:44	Eco Galley '04	157
⑤ <a href="http://people.cornell.edu/pages/sah67/summer.html">http://people.cornell.edu/pages/sah67/summer.html</a>	03/02/2005 15:27:48		158

### 7.1.14.18 Bird screensavers search and birds zip file

⑤ <a href="http://www.google.co.uk/search?client=firefox-a&amp;tts=org.mozilla%3Aen-GB%3Aofficial_s&amp;hl=en&amp;q=bird+screensavers&amp;meta=&amp;bttnG=Google+Search">http://www.google.co.uk/search?client=firefox-a&amp;tts=org.mozilla%3Aen-GB%3Aofficial_s&amp;hl=en&amp;q=bird+screensavers&amp;meta=&amp;bttnG=Google+Search</a>	09/02/2005 11:27:00	Google Search: bird screensavers	
⑤ <a href="http://www.traveltex.com/screen.asp?SNe=6245300&amp;L=0&amp;SS=1">http://www.traveltex.com/screen.asp?SNe=6245300&amp;L=0&amp;SS=1</a>	09/02/2005 11:27:12	traveltex.com	Screensavers
⑤ <a href="http://www.traveltex.com/downloads/screensavers/birds.zip">http://www.traveltex.com/downloads/screensavers/birds.zip</a>	09/02/2005 11:27:48		

## Bookmarked Pages

[http://www.naturewallpaper.net/birds\\_L.html](http://www.naturewallpaper.net/birds_L.html)







**RELATED WHY FILES:** The best songs, it would seem, are about love. Whether it's a blues singer lamenting a lost love, or the sirens luring Odysseus to the shoals, a good song is a great way to attract the opposite sex.

[Evolution](#)  
[Bird migration](#)  
[Snail sex](#)

[Science of love](#)

[Sleepy birds learn better](#)  
Songbirds perform their vocal gymnastics to mark territory and get noticed by eligible females.

[The mating song of the black-capped chickadee helps females decide who's sexy, and who isn't. Courtesy National Park Service.](#)  
Many scientists think the quality of the song tells her about his health -- since only a healthy guy bird could belt out the avian equivalent of "Lover Man."



Now we hear that female black-capped chickadees do more than listen closely. When their fellas lose out in a song competition, the ladies respond.

But not with a soothing, "Honey, maybe you can't hit high C-sharp, but you're still number-one. Come kiss my chicken lips."

No. The takeaway message for the ladies is: "I married a loser!"

And then they step outside the nest for some quick action with another guy! In evolutionary terms, that would guarantee that at least some of her young get top-notch genes.



#### The day I lost my baby

This, in short, is the message of a new study by Daniel Mennill and colleagues at Queen's University, Kingston, Ontario. Mennill, a graduate student, is interested in how animals make decisions and especially how birds communicate during mating.

## APPENDIX G – REGISTRY ANALYSIS

---

### Shutdown time

Key	Type	Value
CSDReleaseType	REG_DWORD	0x00000000
CSDVersion	REG_DWORD	0x00000200
Directory	REG_EXPAND_SZ	%SystemRoot%
ErrorMode	REG_DWORD	0x00000000
NoInteractiveServices	REG_DWORD	0x00000000
ShellErrorMode	REG_DWORD	0x00000001
ShutdownTime	REG_BINARY	c4 5d a9 30 ca 0e c5 01
SystemDirectory	REG_EXPAND_SZ	%SystemRoot%\system32

Hex viewer

0000 c4 5d a9 30 ca 0e c5 01	.].0....	int8: -60 uint8: 196 int16: 24004 uint16: 24004 int32: 816405956 uint32: 816405956 unixtime: 1995/11/15 03:25:56 int64: 127524426012515780 uint64: 127524426012515780 filetime64: 2005/02/09 17:10:01
------------------------------	----------	--

### Last user login

03eb   johndoe	ADMIN	
000003EB 2005/02/09 16:49:18		

## Mounted devices

*Floppy disk*

Key	Type	Value
\??\Volume{30bf5ac0-6e1f-11d9-a7bd-806d6172696f}	REG_BINARY	5c 00 3f 00 3f 00 5c 00 46 00 44 00 43 00 23 00 47 00 45 00 4e 00 45 00 52 00 49 00 43 00 5f 00
\??\Volume{30bf5ac1-6e1f-11d9-a7bd-806d6172696f}	REG_BINARY	5c 00 3f 00 3f 00 5c 00 49 00 44 00 45 00 23 00 43 00 64 00 52 00 6f 00 6d 00 53 00 4f 00 4e 00 5f 00
\??\Volume{30bf5ac3-6e1f-11d9-a7bd-806d6172696f}	REG_BINARY	b8 dd b8 dd 00 7e 00 00 00 00 00 00
\??\Volume{44d36d3b-7525-11d9-ab5a-0048545652e0}	REG_BINARY	5c 00 3f 00 3f 00 5c 00 53 00 54 00 4f 00 52 00 41 00 47 00 45 00 23 00 52 00 65 00 6d 00 6f 00
\??\Volume{44d36d43-7525-11d9-ab5a-0048545652e0}	REG_BINARY	b8 dd b8 dd 00 fc 47 bb 00 00 00 00
\DosDevices\A:	REG_BINARY	5c 00 3f 00 3f 00 5c 00 46 00 44 00 43 00 23 00 47 00 45 00 4e 00 45 00 52 00 49 00 43 00 5f 00
\DosDevices\C:	REG_BINARY	b8 dd b8 dd 00 7e 00 00 00 00 00
\DosDevices\D:	REG_BINARY	5c 00 3f 00 3f 00 5c 00 49 00 44 00 45 00 23 00 43 00 64 00 52 00 6f 00 6d 00 53 00 4f 00 4e 00 5f 00
\DosDevices\E:	REG_BINARY	5c 00 3f 00 3f 00 5c 00 53 00 54 00 4f 00 52 00 41 00 47 00 45 00 23 00 52 00 65 00 6d 00 6f 00
\DosDevices\F:	REG_BINARY	b8 dd b8 dd 00 fc 47 bb 00 00 00 00

Hex viewer		
0000	5c 00 3f 00 3f 00 5c 00 46 00 44 00 43 00 23 00	\.?.?.\.F.D.C.#.
0010	47 00 45 00 4e 00 45 00 52 00 49 00 43 00 5f 00	G.E.N.E.R.I.C..
0020	46 00 4c 00 4f 00 50 00 50 00 59 00 5f 00 44 00	F.L.O.P.P.Y..D.
0030	52 00 49 00 56 00 45 00 23 00 34 00 26 00 33 00	R.I.V.E.#.4.&.3.
0040	33 00 62 00 63 00 31 00 38 00 66 00 61 00 26 00	3.b.c.1.8.f.a.&.
0050	30 00 26 00 30 00 23 00 7b 00 35 00 33 00 66 00	0.&#.{.5.3.f.
0060	35 00 36 00 33 00 30 00 64 00 2d 00 62 00 36 00	5.6.3.0.d.-.b.6.
0070	62 00 66 00 2d 00 31 00 31 00 64 00 30 00 2d 00	b.f.-.1.1.d.0.-.
0080	39 00 34 00 66 00 32 00 2d 00 30 00 30 00 61 00	9.4.f.2.-.0.o.a.
0090	30 00 63 00 39 00 31 00 65 00 66 00 62 00 38 00	0.c.9.1.e.f.b.8.
00a0	62 00 7d 00	b.}.
		int8: 92
		uint8: 92
		int16: 92
		uint16: 92
		int32: 4128860
		uint32: 4128860
		unixtime: 1970/02/17 18:54:20
		int64: 25895968444448860
		uint64: 25895968444448860
		filetime64: 2091/05/14 23:52:13

### Sony CD drive

Key	Type	Value
\??\Volume{30bf5ac0-6e1f-11d9-a7bd-806d6172696f}	REG_BINARY	5c 00 3f 00 3f 00 5c 00 49 00 44 00 45 00 23 00 43 00 23 00 47 00 45 00 4e 00 45 00 52 00 49 00 43 00 5f 00 4
\??\Volume{30bf5ac1-6e1f-11d9-a7bd-806d6172696f}	REG_BINARY	5c 00 3f 00 3f 00 5c 00 49 00 44 00 45 00 23 00 43 00 64 00 52 00 6f 00 6d 00 53 00 4f 00 4e 00 5
\??\Volume{30bf5ac3-6e1f-11d9-a7bd-806d6172696f}	REG_BINARY	b8 dd b8 dd 00 7e 00 00 00 00 00 00
\??\Volume{44d36d3b-7525-11d9-ab5a-0048545652e0}	REG_BINARY	5c 00 3f 00 3f 00 5c 00 53 00 54 00 4f 00 52 00 41 00 47 00 45 00 23 00 52 00 65 00 6d 00 6f 00 7
\??\Volume{44d36d43-7525-11d9-ab5a-0048545652e0}	REG_BINARY	b8 dd b8 dd 00 fc 47 bb 00 00 00 00
\DosDevices\A:	REG_BINARY	5c 00 3f 00 3f 00 5c 00 46 00 44 00 43 00 23 00 47 00 45 00 4e 00 45 00 52 00 49 00 43 00 5f 00 4
\DosDevices\C:	REG_BINARY	b8 dd b8 dd 00 7e 00 00 00 00 00 00
\DosDevices\D:	REG_BINARY	5c 00 3f 00 3f 00 5c 00 49 00 44 00 45 00 23 00 43 00 64 00 52 00 6f 00 6d 00 53 00 4f 00 4e 00 5
\DosDevices\E:	REG_BINARY	5c 00 3f 00 3f 00 5c 00 53 00 54 00 4f 00 52 00 41 00 47 00 45 00 23 00 52 00 65 00 6d 00 6f 00 7
\DosDevices\F:	REG_BINARY	b8 dd b8 dd 00 fc 47 bb 00 00 00 00

Hex viewer	
0000	5c 00 3f 00 3f 00 5c 00 49 00 44 00 45 00 23 00
0010	43 00 64 00 52 00 6f 00 6d 00 53 00 4f 00 4e 00
0020	59 00 5f 00 43 00 44 00 55 00 34 00 38 00 31 00
0030	31 00 5f 00
0040	5f 00
0050	5f 00
0060	5f 00 5f 00 5f 00 5f 00 5f 00 50 00 59 00 30 00
0070	39 00 5f 00 5f 00 5f 00 5f 00 23 00 35 00 26 00
0080	31 00 61 00 38 00 65 00 39 00 30 00 64 00 37 00
0090	26 00 30 00 26 00 30 00 2e 00 31 00 2e 00 30 00
00a0	23 00 7b 00 35 00 33 00 66 00 35 00 36 00 33 00
00b0	30 00 64 00 2d 00 62 00 36 00 62 00 66 00 2d 00
00c0	31 00 31 00 64 00 30 00 2d 00 39 00 34 00 66 00
	Y.?.?\.\I.D.E.#.
	C.d.R.o.m.S.O.N.
	Y._.C.D.U.4.8.1.
	1._._._._._._._.
	_._._._._._._._.
	_._._._._._._._.
	_._._._.P.Y.0.
	9._._._.#.5.&.
	1.a.8.e.9.0.d.7.
	&.0.&.0...1..0.
	#.{.5.3.f.5.6.3.
	0.d.-.b.6.b.f.-.
	1.1.d.0.-.9.4.f.
	int8: 0
	uint8: 0
	int16: 16128
	uint16: 16128
	int32: 1543520000
	uint32: 1543520000
	unixtime: 2018/11/29 19:33:20
	int64: 4899996660471447296
	uint64: 4899996660471447296
	filetime64: 2021/02/20 12:03:11

## Removable USB drive

Key	Type	Value
\??\Volume{30bf5ac0-6e1f-11d9-a7bd-806d6172696f}	REG_BINARY	5c 00 3f 00 3f 00 5c 00 46 00 44 00 43 00 23 00 47 00 45 00 4e 00 45 00 52 00 49 00 43 00 5f 00
\??\Volume{30bf5ac1-6e1f-11d9-a7bd-806d6172696f}	REG_BINARY	5c 00 3f 00 3f 00 5c 00 49 00 44 00 45 00 23 00 43 00 64 00 52 00 6f 00 6d 00 53 00 4f 00 4e 00
\??\Volume{30bf5ac3-6e1f-11d9-a7bd-806d6172696f}	REG_BINARY	b8 dd b8 dd 00 7e 00 00 00 00 00
\??\Volume{44d36d3b-7525-11d9-ab5a-0048545652e0}	REG_BINARY	5c 00 3f 00 3f 00 5c 00 53 00 54 00 4f 00 52 00 41 00 47 00 45 00 23 00 52 00 65 00 6d 00 6f 00
\??\Volume{44d36d43-7525-11d9-ab5a-0048545652e0}	REG_BINARY	b8 dd b8 dd 00 fc 47 bb 00 00 00 00
\DosDevices\A:	REG_BINARY	5c 00 3f 00 3f 00 5c 00 46 00 44 00 43 00 23 00 47 00 45 00 4e 00 45 00 52 00 49 00 43 00 5f 00
\DosDevices\C:	REG_BINARY	b8 dd b8 dd 00 7e 00 00 00 00 00
\DosDevices\D:	REG_BINARY	5c 00 3f 00 3f 00 5c 00 49 00 44 00 45 00 23 00 43 00 64 00 52 00 6f 00 6d 00 53 00 4f 00 4e 00
\DosDevices\E:	REG_BINARY	5c 00 3f 00 3f 00 5c 00 53 00 54 00 4f 00 52 00 41 00 47 00 45 00 23 00 52 00 65 00 6d 00 6f 00
\DosDevices\F:	REG_BINARY	b8 dd b8 dd 00 fc 47 bb 00 00 00 00

Hex viewer	
0000 5c 00 3f 00 3f 00 5c 00 53 00 54 00 4f 00 52 00 \.?.?.\S.T.O.R. 0010 41 00 47 00 45 00 23 00 52 00 65 00 6d 00 6f 00 A.G.E.#.R.e.m.o. 0020 76 00 61 00 62 00 6c 00 65 00 4d 00 65 00 64 00 v.a.b.l.e.M.e.d. 0030 69 00 61 00 23 00 37 00 26 00 32 00 66 00 62 00 i.a.#.7.&2.f.b. 0040 34 00 32 00 37 00 64 00 63 00 26 00 30 00 26 00 4.2.7.d.c.&.0.& 0050 52 00 4d 00 23 00 7b 00 35 00 33 00 66 00 35 00 R.M.#.{.5.3.f.5. 0060 36 00 33 00 30 00 64 00 2d 00 62 00 36 00 62 00 6.3.0.d..b.6.b. 0070 66 00 2d 00 31 00 31 00 64 00 30 00 2d 00 39 00 f.-.1.1.d.0.-.9. 0080 34 00 66 00 32 00 2d 00 30 00 30 00 61 00 30 00 4.f.2.-.0.0.a.0. 0090 63 00 39 00 31 00 65 00 66 00 62 00 38 00 62 00 c.9.1.e.f.b.8.b. 00a0 7d 00 }.	int8: 92 uint8: 92 int16: 92 uint16: 92 int32: 4128860 uint32: 4128860 unixtime: 1970/02/17 18:54:20 int64: 25895968444448860 uint64: 25895968444448860 filetime64: 2091/05/14 23:52:13

## APPENDIX H – PREFETCH ANALYSIS

### Prefetch Images

Prefetch Images					
ACRORD32.EXE-13285B88.pf	IMAPI.EXE-0BF740A4.pf	REALONEMESSAGECENTER.EXE-0F115151.pf	RUNDLL32.EXE-2F26E69F.pf	TX_BIRDS.EXE-2861E2BC.pf	UPDATE.EXE-2E63FB5E.pf
ACRORD32INFO.EXE-013EA364.pf	Layout.ini	REALPLAY.EXE-1BF219BD.pf	RUNDLL32.EXE-3632F4DF.pf	TX_BIRDS.SCR-03FEBFC4.pf	UPDATE.EXE-309A48CB.pf
DEFNRC.EXE-1347939B.pf	LOGON.SCR-151EFAEA.pf	REALPLAY_MOUNTPOINTS.EXE-35C57E1D.pf	RUNDLL32.EXE-4499C56E.pf	UNREGMP2.EXE-07CACB61.pf	UPDATE.EXE-31ADDE21.pf
DEFrag.EXE-273F131E.pf	MSCRIPT_INUSE.EXE-04BEDF94.pf	REALSCHED.EXE-3282FD31.pf	RUNDLL32.EXE-44EABC3.pf	UPDATE.EXE-016555EF.pf	UPDATERUI.EXE-21775FB9
DFRGNNTFS.EXE-269967DF.pf	MCUPDATE.EXE-361E6FD8.pf	REFRESH.EXE-30802498.pf	RUNDLL32.EXE-451FC2C0.pf	UPDATE.EXE-01F68CE8.pf	USERINIT.EXE-30B18140.
DADMIN.EXE-00BCB146.pf	MMC.EXE-0A5AF4A1.pf	REGEDIT.EXE-1B606482.pf	RUNDLL32.EXE-470F11BD.pf	UPDATE.EXE-02F1FE9C.pf	WINDOWS-KB890830-V1.1-
ENU.EXE-0860773E.pf					
DMREMOTE.EXE-2F82CB90.pf	MMC.EXE-3D93B3AE.pf	REGSVR32.EXE-25EEFE2F.pf	SCAN32.EXE-34BB0851.pf	UPDATE.EXE-035810C5.pf	WINPT.EXE-258D0ABC.pf
DRTSN32.EXE-284852AC.pf	MRT.EXE-0847AD6A.pf	RNXPROC.EXE-1CD3A84F.pf	SETREG.EXE-32F24AA5.pf	UPDATE.EXE-0DF31E49.pf	WINPT-INSTALL-1.0RC2.E
EX-1309F18A.pf					
DWIN.EXE-30875ADC.pf	MSHTA.EXE-331DF029.pf	RPHelperApp.EXE-33CB172B.pf	SETUP50.EXE-362FF7C9.pf	UPDATE.EXE-1085B232.pf	WINWORD.EXE-37F6AE09.p
EXPLORER.EXE-082F38A9.pf	MSIEXEC.EXE-2F8A8CAE.pf	RUNDLL32.EXE-13CC3015.pf	SHMGRATE.EXE-1BA69E68.pf	UPDATE.EXE-10875175.pf	WMIAPSRV.EXE-1E2270A5.
FIREFOX.EXE-17EE503B.pf	MSOHTMED.EXE-1BD4AAD2.pf	RUNDLL32.EXE-169CA248.pf	SHSTAT.EXE-2A9CD834.pf	UPDATE.EXE-1428CF74.pf	WMIPRVSE.EXE-28F301A9.
FIREFOX.EXE-28641590.pf	NOTEPAD.EXE-336351A9.pf	RUNDLL32.EXE-18FE9799.pf	SVCHOST.EXE-3530F672.pf	UPDATE.EXE-16AE1C01.pf	WUAUCLT.EXE-399ABE72.p
GPG.EXE-3205295F.pf	NTOSBOOT-B00DFAAD.pf	RUNDLL32.EXE-2576181F.pf	TBMON.EXE-193BB9A5.pf	UPDATE.EXE-1AF0D1BA.pf	XPINSTALL.EXE-1DAC9645
HELP SVC.EXE-2878DDA2.pf	NTVDM.EXE-1A10A423.pf	RUNDLL32.EXE-286A7F8C.pf	THUNDE~1.EXE-2874618F.pf	UPDATE.EXE-2913E626.pf	
IE4UINIT.EXE-169ASA39.pf	READER_SL.EXE-3614FA6E.pf	RUNDLL32.EXE-2AF77CC9.pf	TX_BIRDS.EXE-248103EC.pf	UPDATE.EXE-299C11EA.pf	

## Using Wine Emulator

```
cmp209@cmp209-virtual-machine:~/suspectDrive$ cd WINDOWS
cmp209@cmp209-virtual-machine:~/suspectDrive/WINDOWS$ ls
'Blue Lace 16.bmp'      phone      KB834707.log    nsapps      'Prairie Wind.bmp'    SET8.tmp      twain_32
WindowsUpdate.log       explorer.exe   KB867282.log   msdfmap.ini  Prefetch      setupact.log   twain_32.dll
'winhelp.exe'           bootstat.dat  KB873333.log   msgsocm.log  provisioning  setupapi.log   twain.dll
'SNTUninstallKB88347075' clock.avi     KB873339.log   msqinst.log  randseed.rnd  setuperr.log  twunk_16.exe
'winhlp32.exe'          comsetacl.log FaxSetup.log    KB885250.log  regedit.exe   setuplog.txt  twunk_32.exe
'SNTUninstallKB8873395'  config       Fonts        KB885835.log  NOTEPAD.EXE  REGLOCS.OLD  'Soap Bubbles.bmp' tx_birds.dll
'win.ini'               comsetup.log  'Firefox Wallpaper.bmp' KB885836.log  REGISTRY     SHELLNEW    tx_birds.dat
'winnt256.bmp'          control.ini   Greenstone.bmp KB886185.log  nsreg.dat    regopt.log   SoftwareDistribution tx_birds.exe
'winnt.bmp'             crouchingkokako.dll KB888113.log  ocgen.log    resources     Sti_Trace.log UninstallFirefox.exe
'winxs'                help        hh.exe       KB888302.log  ocmn.log    Rhododendron.bmp system     UninstallThunderbird.exe
'winsetup.log'          iis6.log     KB890047.log  ODBC.INI    'River Sumida.bmp' system32
'SNTUninstallKB8881025'  log         KB890175.log  ODBCINST.INI 'Santa Fe Stucco.bmp' system.ini
'winxs'                log         insns.BAK    OEMABLog.txt schedlgU.Txt  tabletc.log  TASKMAN.EXE
'winxs'                log         insns.log    Medctr0C.log  security     security     vbaddin.ini
'winxs'                log         log         opuc.dll    sessmgr.setup.log Tasks      vb.ini
'winxs'                log         log         mozver.dat  ochealth     SET3.tmp    vmmreg32.dll
'winxs'                log         log         nsagent    PeerNet      SET4.tmp    web
'winxs'                log         log         PeerNet    tsoc.log    Temp      wiadecbug.log
'winxs'                log         log         PeerNet    tsoc.log    WindowsShell.Manifest wiaservc.log
0.Log                  log         log         PeerNet    tsoc.log    WindowsShell.Manifest WindowsShell.Manifest

cmp209@cmp209-virtual-machine:~/suspectDrive/WINDOWS$ wine tx_birds.exe
```

### Prefetch PECmd Images

Directory: C:\Users\... \Downloads\PECmd			
Mode	LastWriteTime	Length	Name
d----	15/04/2024	12:57	pf
da---	15/04/2024	12:40	Prefetch
-a---	15/04/2024	12:37	3977464 PECmd.exe
-a---	09/02/2005	13:50	10094 TX_BIRDS.SCR-03FEBFC4.pf
 PS C:\Users\... \Downloads\PECmd> cd pf			
PS C:\Users\... \Downloads\PECmd\pf> ls			
Directory: C:\Users\... \Downloads\PECmd\pf			
Mode	LastWriteTime	Length	Name
-a---	02/02/2005	14:50	18788 REGEDIT.EXE-1B606482.pf
-a---	09/02/2005	13:50	12730 TX_BIRDS.EXE-24B103EC.pf
-a---	09/02/2005	13:50	10094 TX_BIRDS.SCR-03FEBFC4.pf
-a---	09/02/2005	11:03	14026 WINPT.EXE-258D0ABC.pf
-a---	09/02/2005	16:42	25058 WMIPRVSE.EXE-28F301A9.pf
 PS C:\Users\... \Downloads\PECmd\pf>			

```

PS C:\Users\... \Downloads\PECmd> .\PECmd.exe -f C:\Users\... \Downloads\PECmd\pF\TX_BIRDS.EXE-24B103EC.pf
PECmd version 1.5.0.0

Author: Eric Zimmerman (saericzimmerman@gmail.com)
https://github.com/EricZimmerman/PECmd

Command line: -f C:\Users\snorre\Downloads\PECmd\pF\TX_BIRDS.EXE-24B103EC.pf

Warning: Administrator privileges not found!

Keywords: temp, tap

Processing C:\Users\... \Downloads\PECmd\pF\TX_BIRDS.EXE-24B103EC.pf

Created on: 2004-01-15 11:56:56
Modified on: 2005-02-09 13:58:37
Last accessed on: 2024-04-16 08:55:59

Executable name: TX_BIRDS.EXE
Hash: 24B103EC
File size (bytes): 32,730
Version: Windows XP or Windows Server 2003

Run count: 3
Last run: 2005-02-09 13:58:27

Volume information:

#0: Name: \DEVICE\HARDISKVOLUME1 Serial: 88412714 Created: 2005-01-24 15:56:15 Directories: 8 File references: 34

Directories referenced: 8

#0: \DEVICE\HARDISKVOLUME1\
#1: \DEVICE\HARDISKVOLUME1\PROGRAM FILES\
#2: \DEVICE\HARDISKVOLUME1\PROGRAM FILES\WINDOWS PRIVACY TOOLS\
#3: \DEVICE\HARDISKVOLUME1\PROGRAM FILES\WINDOWS PRIVACY TOOLS\WINPT\
#4: \DEVICE\HARDISKVOLUME1\WINDOWS\
#5: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\
#6: \DEVICE\HARDISKVOLUME1\WINDOWS\WINSX\
#7: \DEVICE\HARDISKVOLUME1\WINDOWS\WINSX\X86_MICROSOFT WINDOWS COMMON CONTROLS_6595864144CCF1DF_6.0.2680.2188_X-WN_AB4F1FF9\

Files referenced: 20

#0: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\NTDLL.DLL
#1: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\KERNEL32.DLL
#2: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\UNICODE.NLS
#3: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\LOCALE.NLS
#4: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\SORTTABLE.NLS
#5: \DEVICE\HARDISKVOLUME1\WINDOWS\TX_BIRDS.EXE (Executable: True)
#6: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\USER32.DLL
#7: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\GDI32.DLL
#8: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\COMDLG32.DLL
#9: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\SHLWAPI.DLL
#10: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\ADVAPI32.DLL
#11: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\RBCRT4.DLL
#12: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\MSVCR7.DLL
#13: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\COMCTL32.DLL
#14: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\SHELL32.DLL
#15: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\WINMM.DLL
#16: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\CTY86.NLS
#17: \DEVICE\HARDISKVOLUME1\WINDOWS\WINSX\X86_MICROSOFT WINDOWS COMMON CONTROLS_6595864144CCF1DF_6.0.2680.2188_X-WN_AB4F1FF9\COMCTL32.DLL
#18: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\SORTKEY.NLS
#19: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\EMTAPI.DLL
#20: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\PSAPI.DLL
#21: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\NETAPI32.DLL
#22: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\UXTHEME.DLL
#23: \DEVICE\HARDISKVOLUME1\WINDOWS\TX_BIRDS.DLL
#24: \DEVICE\HARDISKVOLUME1\PROGRAM FILES\WINDOWS PRIVACY TOOLS\WINPT\PTD.DLL

----- Processed C:\Users\... \Downloads\PECmd\pF\TX_BIRDS.EXE-24B103EC.pf in 0.02750356 seconds -----

```

```
PS C:\Users\..._Downloads\PECmd> .\PECmd.exe -f C:\Users\..._Downloads\PECmd\pf\REGEDIT.EXE-1B606482.pf
PECmd version 1.5.0.0
```

```
Author: Eric Zimmerman (saericzimmerman@gmail.com)
https://github.com/EricZimmerman/PECmd
```

```
Command line: -f C:\Users\..._Downloads\PECmd\pf\REGEDIT.EXE-1B606482.pf
```

```
Warning: Administrator privileges not found!
```

```
Keywords: temp, tmp
```

```
Processing C:\Users\..._Downloads\PECmd\pf\REGEDIT.EXE-1B606482.pf
```

```
Created on: 2024-04-15 11:54:13
```

```
Modified on: 2005-02-02 14:50:55
```

```
Last accessed on: 2024-04-16 08:57:32
```

```
Executable name: REGEDIT.EXE
```

```
Hash: 1B606482
```

```
File size (bytes): 18,788
```

```
Version: Windows XP or Windows Server 2003
```

```
Run count: 7
```

```
Last run: 2005-02-02 14:50:55
```

```
Volume information:
```

```
#0: Name: \DEVICE\HARDISKVOLUME1 Serial: 88412714 Created: 2005-01-24 15:56:15 Directories: 11 File references: 48
```

```
Directories referenced: 11
```

```
#0: \DEVICE\HARDISKVOLUME1\
#1: \DEVICE\HARDISKVOLUME1\DOCUMENTS AND SETTINGS\
#2: \DEVICE\HARDISKVOLUME1\DOCUMENTS AND SETTINGS\ALL USERS\
#3: \DEVICE\HARDISKVOLUME1\DOCUMENTS AND SETTINGS\ALL USERS\APPLICATION DATA\
#4: \DEVICE\HARDISKVOLUME1\DOCUMENTS AND SETTINGS\ALL USERS\APPLICATION DATA\NETWORK ASSOCIATES\
#5: \DEVICE\HARDISKVOLUME1\DOCUMENTS AND SETTINGS\ALL USERS\APPLICATION DATA\NETWORK ASSOCIATES\BOPDATA\
#6: \DEVICE\HARDISKVOLUME1\WINDOWS\
#7: \DEVICE\HARDISKVOLUME1\WINDOWS\APPATCH\
#8: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\
#9: \DEVICE\HARDISKVOLUME1\WINDOWS\WINSXS\
#10: \DEVICE\HARDISKVOLUME1\WINDOWS\WINSXS\X86_MICROSOFT.WINDOWS.COMMON-CONTROLS_6595864144CCF1DF_6.0.2698.2188_X-MW_A84F1FF9\
```

```
Files referenced: 48
```

```
#0: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\VTDLL.DLL
#1: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\KERNEL32.DLL
#2: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\UNICODE.NLS
#3: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\LOCALE.NLS
#4: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\SOFTIBL.NLS
#5: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\WSVCBL.DLL
#6: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\REGEDIT.EXE (Executable: True)
#7: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\ADVAPI32.DLL
#8: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\RPCRT4.DLL
#9: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\GDI32.DLL
#10: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\USER32.DLL
#11: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\SHLWAPI.DLL
#12: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\CPOL32.DLL
#13: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\SHELL32.DLL
#14: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\AUTOR2.DLL
#15: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\CLUI32.DLL
#16: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\OLE32.DLL
#17: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\OLEAUT32.DLL
#18: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\ULIB.DLL
#19: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\CLDR.DLL
#20: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\SHINING.DLL
#21: \DEVICE\HARDISKVOLUME1\WINDOWS\APPHATOK\SPANISH_508
#22: \DEVICE\HARDISKVOLUME1\WINDOWS\APPHATOK\ASIANAL.DLL
#23: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\WTRW.DLL
#24: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\WACM32.DLL
#25: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\VERSION.DLL
#26: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\USERENV.DLL
#27: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\UITHeme.DLL
#28: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\TYPE.NLS
#29: \DEVICE\HARDISKVOLUME1\WINDOWS\WINDOWSHELL.MANIFEST
#30: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\COMUI.SOFTWARE
#31: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\SONTHE.NLS
#32: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\ONTAPE.DLL
#33: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\PSAPI.DLL
#34: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\NETAPI32.DLL
#35: \DEVICE\HARDISKVOLUME1\DOCUMENTS AND SETTINGS\ALL USERS\APPLICATION DATA\NETWORK ASSOCIATES\BOPDATA\_DATE-20050202_TIME-12352628_ENTERCEPTEXCEPTIONS.DAT
#36: \DEVICE\HARDISKVOLUME1\DOCUMENTS AND SETTINGS\ALL USERS\APPLICATION DATA\NETWORK ASSOCIATES\BOPDATA\_DATE-20050202_TIME-12352628_ENTERCEPTRULES.DAT
#37: \DEVICE\HARDISKVOLUME1\WINDOWS\TEMP\ICANBD.TMP\VSCECP.BAK (Keyword: True)
#38: \DEVICE\HARDISKVOLUME1\WINDOWS\TEMP\ICANBD.TMP\VSCECP.BAK (Keyword: True)
#39: \DEVICE\HARDISKVOLUME1\WINDOWS\TEMP\VSCE888.CFG (Keyword: True)
#40: \DEVICE\HARDISKVOLUME1\DOCUMENTS AND SETTINGS\ALL USERS\APPLICATION DATA\NETWORK ASSOCIATES\BOPDATA\_DATE-20050228_TIME-162234351_ENTERCEPTEXCEPTIONS.DAT
#41: \DEVICE\HARDISKVOLUME1\DOCUMENTS AND SETTINGS\ALL USERS\APPLICATION DATA\NETWORK ASSOCIATES\BOPDATA\_DATE-20050228_TIME-162234351_ENTERCEPTRULES.DAT
#42: \DEVICE\HARDISKVOLUME1\WINDOWS\PREFETOK\EXPLORE.IXX-27122324.PF
#43: \DEVICE\HARDISKVOLUME1\DOCUMENTS AND SETTINGS\ALL USERS\APPLICATION DATA\NETWORK ASSOCIATES\BOPDATA\_DATE-20050228_TIME-160813066_ENTERCEPTEXCEPTIONS.DAT
#44: \DEVICE\HARDISKVOLUME1\DOCUMENTS AND SETTINGS\ALL USERS\APPLICATION DATA\NETWORK ASSOCIATES\BOPDATA\_DATE-20050228_TIME-160813066_ENTERCEPTRULES.DAT
#45: \DEVICE\HARDISKVOLUME1\WINDOWS\TEMP\VSCE888.TMP\VSCE888.CFG (Keyword: True)
```

```
----- Processed C:\Users\..._Downloads\PECmd\pf\REGEDIT.EXE-1B606482.pf in 0.03375080 seconds -----
```

```

PS C:\Users\eric... Downloads\PECmd> .\PECmd.exe -f C:\Users\eric... Downloads\PECmd\pF\TX_BIRDS.SCR-B3FEBFC4.pf
PECmd version 1.5.8.0

Author: Eric Zimmerman (saericzimmerman@gmail.com)
https://github.com/EricZimmerman/PECmd

Command line: -f C:\Users\eric... Downloads\PECmd\pF\TX_BIRDS.SCR-B3FEBFC4.pf

Warning: Administrator privileges not found!

Keywords: beep, tap

Processing C:\Users\eric... Downloads\PECmd\pF\TX_BIRDS.SCR-B3FEBFC4.pf

Created on: 2024-01-15 11:07:53
Modified on: 2025-02-09 13:50:37
Last accessed on: 2024-01-16 06:59:43

Executable name: TX_BIRDS.SCR
Hash: B3FEBFC4
File size (bytes): 18,098
Version: Windows XP or Windows Server 2003

Run count: 5
Last run: 2005-02-09 13:50:27

Volume information:

#0: Name: \DEVICE\HARDISKVOLUME1 Serial: 88012714 Created: 2005-01-20 15:56:15 Directories: 13 File references: 39

Directories referenced: 13

#0: \DEVICE\HARDISKVOLUME1\DOCUMENTS AND SETTINGS\
#0: \DEVICE\HARDISKVOLUME1\DOCUMENTS AND SETTINGS\ALL USERS\
#0: \DEVICE\HARDISKVOLUME1\DOCUMENTS AND SETTINGS\ALL USERS\APPLICATION DATA\
#0: \DEVICE\HARDISKVOLUME1\DOCUMENTS AND SETTINGS\ALL USERS\APPLICATION DATA\NETWORK ASSOCIATES\
#0: \DEVICE\HARDISKVOLUME1\DOCUMENTS AND SETTINGS\ALL USERS\APPLICATION DATA\NETWORK ASSOCIATES\BOPDATA\
#0: \DEVICE\HARDISKVOLUME1\PROGRAM FILES\
#0: \DEVICE\HARDISKVOLUME1\PROGRAM FILES\WINDOWS PRIVACY TOOLS\
#0: \DEVICE\HARDISKVOLUME1\WINDOWS\
#0: \DEVICE\HARDISKVOLUME1\WINDOWS\APPATCH\
#0: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\
#0: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\CONFIG

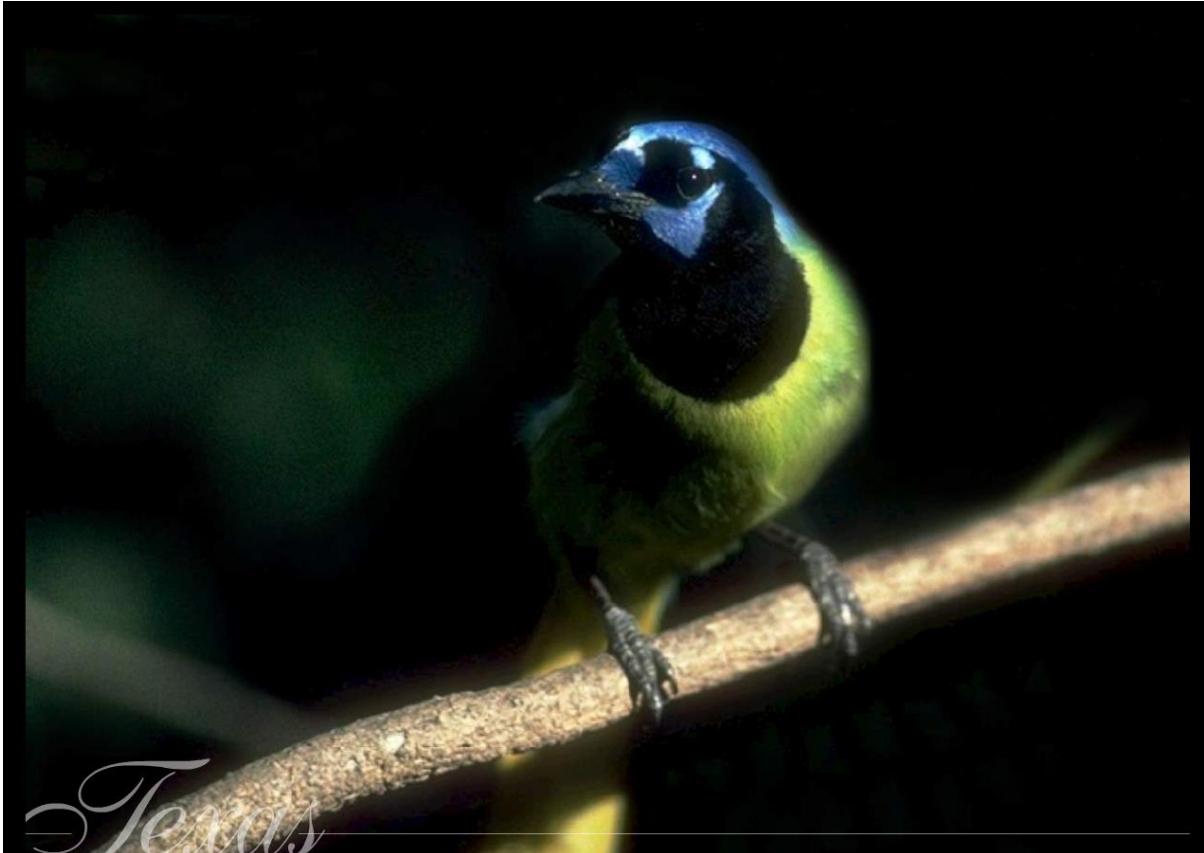
Directories referenced: 28

#0: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\NTDLL.DLL
#0: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\KERNEL32.DLL
#0: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\UNICODE.NLS
#0: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\LOCALE.NLS
#0: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\SOFTTBL.NLS
#0: \DEVICE\HARDISKVOLUME1\WINDOWS\TX_BIRDS.SCR (Executable: True)
#0: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\USER32.DLL
#0: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\GDI32.DLL
#0: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\ADVAPI32.DLL
#0: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\RPCRT4.DLL
#0: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\EDITAB.DLL
#0: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\VSELIBT.DLL
#0: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\PSAPI.DLL
#0: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\NETAPI32.DLL
#0: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\CTYPE.NLS
#0: \DEVICE\HARDISKVOLUME1\DOCUMENTS AND SETTINGS\ALL USERS\APPLICATION DATA\NETWORK ASSOCIATES\BOPDATA\_DATE-20050209_TIME-031037973_ENTERCEPTEXCEPTIONS.DAT
#0: \DEVICE\HARDISKVOLUME1\DOCUMENTS AND SETTINGS\ALL USERS\APPLICATION DATA\NETWORK ASSOCIATES\BOPDATA\_DATE-20050209_TIME-031037973_ENTERCERTRULES.DAT
#0: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\SOFTNEY.NLS
#0: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\UXTHEME.DLL
#0: \DEVICE\HARDISKVOLUME1\WINDOWS\TX_BIRDS.DLL
#0: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSTEM32\CONFIG\SOFTWARE
#0: \DEVICE\HARDISKVOLUME1\PROGRAM FILES\WINDOWS PRIVACY TOOLS\WINPT\PTD.DLL
#0: \DEVICE\HARDISKVOLUME1\APPHELP.DLL
#0: \DEVICE\HARDISKVOLUME1\WINDOWS\SYSMAIN.SOB

————— Processed C:\Users\eric... Downloads\PECmd\pF\TX_BIRDS.SCR-B3FEBFC4.pf in 0.000000 seconds —————

```

Prefetch Screensaver Images



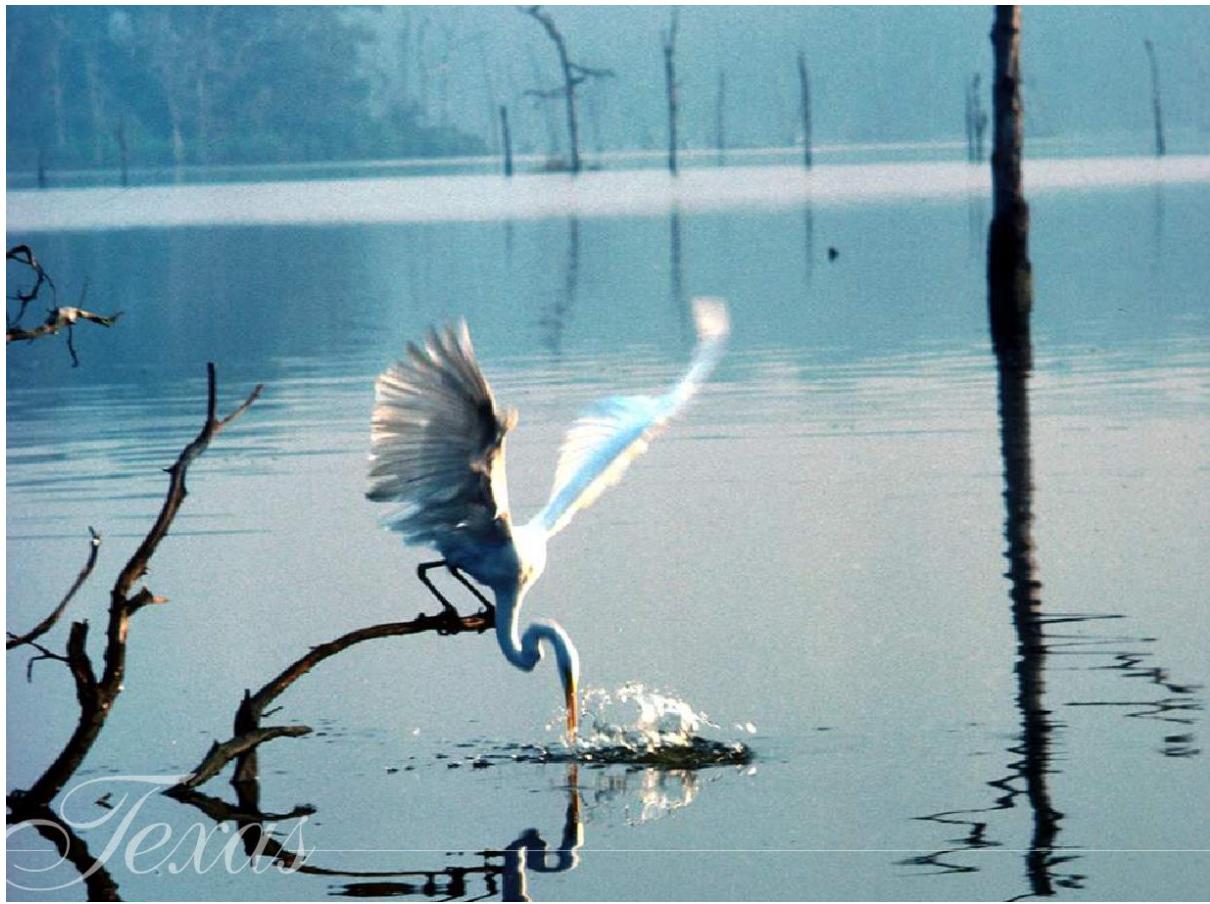


*Texas*

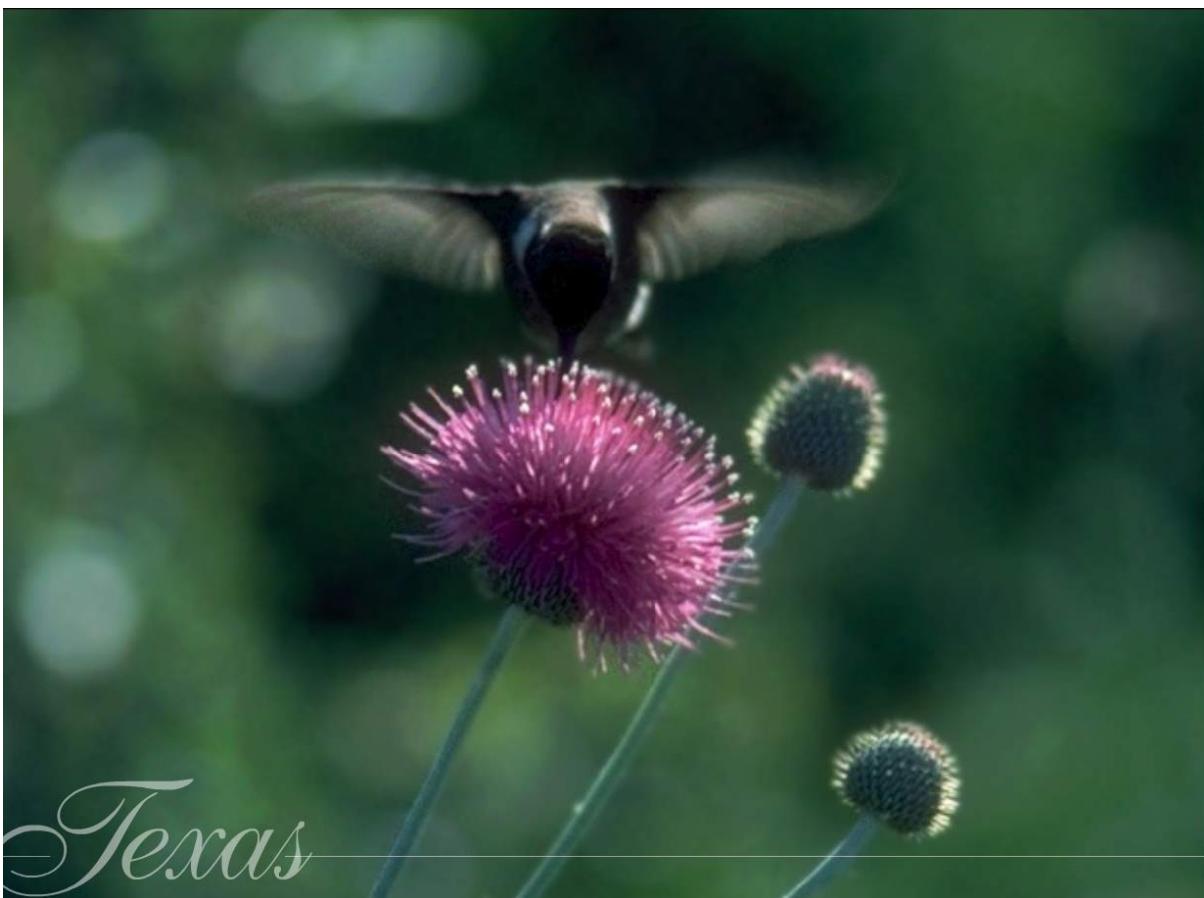




*Texas*



*Texas*



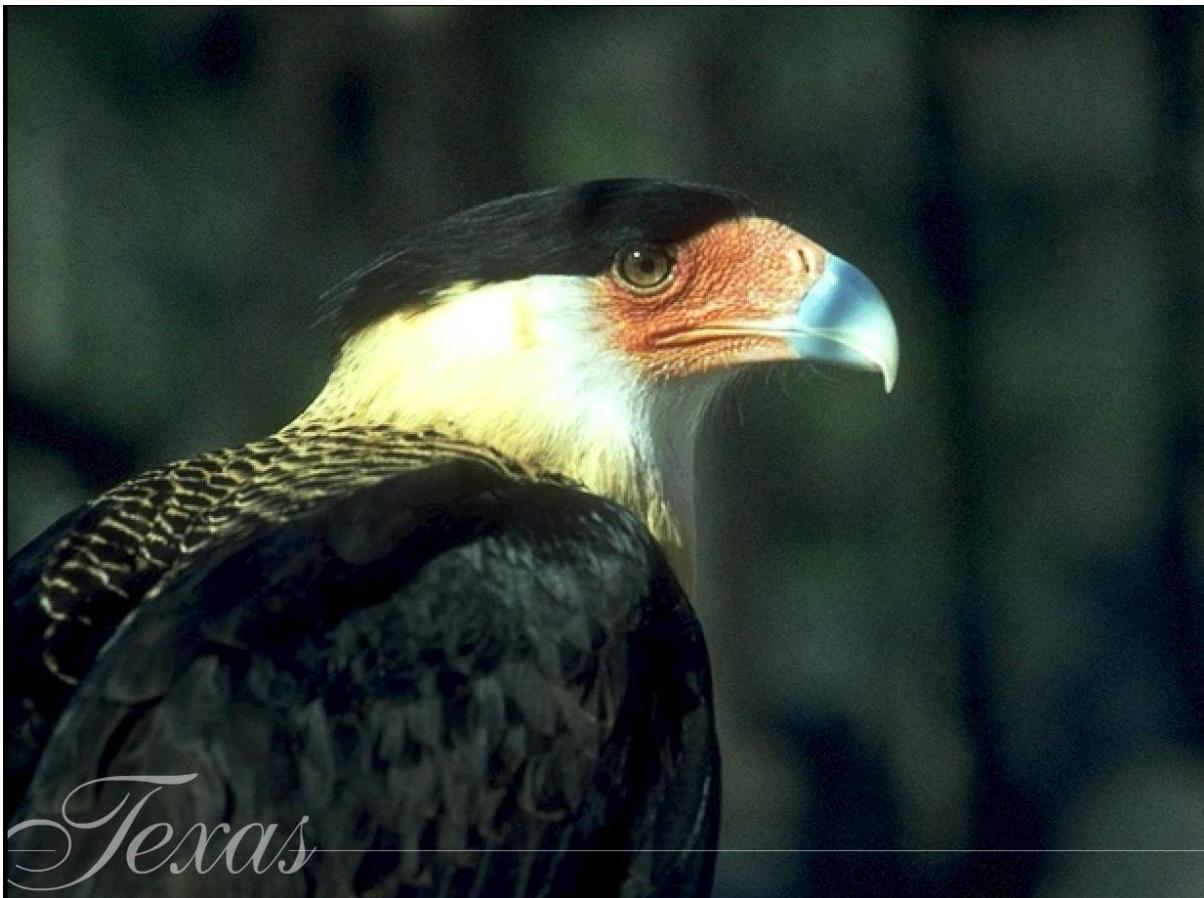
*Texas*



*Texas*



*Texas*



*Texas*

## APPENDIX I – ENCRYPTED ARCHIVE

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WhiteThroatedSparrowInTree.jpg

