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INTERNET SEARCHES TO MONITOR WILDLIFE TRADE

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Internet searches to monitor wildlife trade

SRG 50/10

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by the

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ABOUT UNEP-WORLD CONSERVATION MONITORING CENTRE

The UNEP World Conservation Monitoring Centre (UNEP-WCMC), based in Cambridge, UK, is the specialist biodiversity information and assessment centre of the United Nations Environment Programme (UNEP), run cooperatively with WCMC 2000, a UK charity. The Centre's mission is to evaluate and highlight the many values of biodiversity and put authoritative biodiversity knowledge at the centre of decision-making. Through the analysis and synthesis of global biodiversity knowledge the Centre provides authoritative, strategic and timely information for conventions, countries and organisations to use in the development and implementation of their policies and decisions.

The **UNEP-WCMC** provides objective and scientifically rigorous procedures and services. These include ecosystem assessments, support for the implementation of environmental agreements, global and regional biodiversity information, research on threats and impacts, and the development of future scenarios.

CITATION

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1. INTRODUCTION

During the last decade, and particularly since 2007, trade in wildlife via the internet has been a topic of increasing relevance for the CITES community. Internet trade has been identified as a substantial and growing reason for potential concern and it is generally recognised that actions are needed, including monitoring this form of wildlife trade to gain a better understanding of the problem.

This report presents an overview of the state of affairs relating to wildlife e-commerce, and explores the possibilities of using automated internet searches to monitor this trade. It also provides a discussion of the associated caveats of using such tools.

Although the term 'internet trade' is used throughout the report to simplify the discussion, it must be noted that, while goods can be advertised and sale agreements can occur online, the actual movement of goods still needs to take place physically in order for the trade to materialise.

2. BACKGROUND

2.1. Internet usage globally and in the EU

There are currently ca. 1.6 billion users of the internet worldwide, ca. 24% of the world's population (Internet World Stats, 2009b). Internet use is growing rapidly: between 2000 and 2008, there has been a growth of 342% (>3-fold increase) in the number of users worldwide (Internet World Stats, 2009b).

Most internet users are in Asia (41% of total number of users), followed by Europe (25%), North America (16%) and Latin America and the Caribbean (11%). The remaining 7% of users are in Africa, the Middle East and Oceania. Internet penetration rates are highest in North America (74% of population), followed by Oceania (60%), Europe (49%) and Latin America and the Caribbean (30%). Internet penetration is lowest in Africa (6%), Asia (17%) and the Middle East (23%) (Internet World Stats, 2009b).

In the European Union, 61% of households have access to the internet (Internet World Stats, 2009a). The highest numbers of internet users in the EU are in Germany, the United Kingdom, France, Italy and Spain. The highest penetration rates amongst EU-27 countries are in Finland, the Netherlands, Sweden and Denmark (rates of 80-83%) (Internet World Stats, 2009a). A 2008 survey of activities carried out on the internet during a three-month period for private purposes in EU-27 countries found that 25% of individuals used the internet to order/buy goods or services for private use (Loof, 2008).

2.2. The internet and international trade

There is ample evidence that the internet stimulates trade (e.g. Rao, 1997; Press *et al.,* 2001; Freund and Weinhold, 2004; Clarke and Wallsten, 2004; Papastamkos, 2009). Freund & Wenhold (2004) found that an increase in the growth of web hosts in a country leads to an increase in export growth. Clarke & Wallsten (2004) suggested that access to the internet affects export performance of firms in developing countries and found that higher internet penetration in developing countries is correlated with greater exports to developed countries, but not with trade between developing countries or with exports from developed countries. They also suggested that regulatory policies affecting internet development indirectly affect trade (Clarke and Wallsten, 2004).

2.3. The internet and wildlife trade

2.3.1. CITES discussions

Wildlife, including CITES and non-CITES listed animals and plants, are being traded over the internet. This new form of trade creates a series of potential problems, such as the possibility of illegal trade going more easily undetected.

In a recent European Commission study on enforcement of CITES in the European Union, the use of the internet was identified as the main factor in the perceived increase in illegal wildlife trade entering the European Union since 2000 (Milieu Ltd and Orbicon Consulting, 2006).

Consequently, and "given the dramatic growth in global internet trade and the difficulties in policing these types of transactions", Germany submitted in 2007, on behalf of the European Community Member States, a document suggesting convening a workshop to look at the scope of the problem of wildlife trade over the Internet and formulating recommendations for action to tackle illegal trade in wildlife on the Internet (CITES Secretariat, 2007).

As a result, in Decision 14.35, the Conference of the Parties directed the Secretariat to seek information from the Parties related to internet trade in specimens of CITES-listed species. It further directed the Secretariat to review this information and to prepare a background document for consideration at a workshop at which trade in wildlife via the internet would be discussed.

Notification No. 2007/026 invited CITES Management Authorities to submit information on various issues related to the trade of wildlife via the internet. A total of 19 Parties and one NGO (IFAW) submitted information, a summary of which was prepared by the CITES Secretariat (CITES Secretariat, 2009a). Amongst the findings, the Secretariat noted that "most Parties believed that the impact of the Internet on the rate of illegal wildlife trade is poorly understood, has not been adequately researched and is difficult to quantify. […] Difficulties in monitoring wildlife trade over the Internet were reported by many Parties, although only a few had assigned trained personnel for this task" (CITES Secretariat, 2009a).

A CITES e-commerce workshop was organized in Canada in February 2009 (CITES Secretariat, 2009c). Two working groups were created, one examining the issues associated with legal wildlife e-commerce, the other examining the problems associated with combating illegal trade in wildlife over the internet. Participants adopted a series of recommendations, which included assessing the extent and trends of commerce of CITES-listed species via the internet (CITES Secretariat, 2009c).

The outcomes of the CITES e-commerce workshop were discussed at the 58th meeting of the Standing Committee, and this resulted in the establishment of a Working Group on CITES e-commerce (CITES Secretariat, 2009b). The Committee directed the working group to draft guidelines for consideration at CoP15, to discuss other issues related to e-commerce and to report at the 61st meeting of the Committee. The Committee also directed the Secretariat to develop a toolkit subject to the availability of funding, in order to assist Parties and the general CITES community with the regulation of legal trade in specimens of CITES-listed species via the internet (CITES Secretariat, 2009b).

2.3.2. Previous monitoring efforts

Despite the perceived importance of wildlife e-commerce, relatively little is known about the nature and scale of wildlife trade over the internet. Some efforts have been made in recent years, however. These include:

- In 2001, the Scientific Authority of Mexico prepared a database containing information relating to trade in Mexican Cactaceae via the internet (Mexico Scientific Authority, 2001). Data collected included species name, description of the plant, supplier, origin and price. It was noted that the information compiled did not give an indication of volumes sold and that it would be difficult to obtain such data.

- Between 2005 and 2006, TRAFFIC conducted a survey of wildlife trade on Chinese-language websites (Wu, 2007). The study surveyed Yahoo and eBay, in addition to several independent websites with wildlife trade themes in mainland China, Hong Kong SAR, and Taiwan POC. It also suggested guidelines for data collection for wildlife trade surveys on the internet (Wu, 2007).

- The International Fund for Animal Welfare (IFAW) has conducted various web surveys and produced a series of reports looking at wildlife trade over the internet (IFAW, 2005; IFAW, 2007; IFAW, 2008). One of the surveys (IFAW, 2005) was conducted on English language sites and restricted to trade in live primates, elephant products, turtle and tortoiseshell products, other reptile products and those from wild cats. Another survey (IFAW, 2007) focused on sales of elephant ivory on eBay. The most recent survey (IFAW, 2008) concentrated on Appendix I and some Appendix II species for sale both domestically and internationally in Australia, Canada, China, France, Germany, Russia, the UK and the US.

- UNEP-WCMC prepared various reports for the SRG looking at trade in non-CITES amphibians (SRG 42/10 and SRG 46/8) and reptiles (SRG 48/7 and SRG 49/7) in the EU. As trade data were not available for these non-listed species, demand was assessed through internet surveys, targeting specific websites and conducting Google searches, searching by the species' scientific name, together with various search terms.

- Suiter and Sferrazza (2007) presented a method to monitor wildlife trade using automated internet search and surveillance tools. These automated internet searches were reportedly being used by the US Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS) to monitor the sale and trafficking of invasive vertebrate species over the internet. The authors described the development of two tools: "FAST Search is a web crawler that can locate websites selling or trafficking federally regulated invasive species or other organism or animal products of interest. ISIMS [Invasive Species Internet Monitoring System] is a web application that aids analysts in evaluating, investigating and monitoring websites that may offer invasive vertebrate species for sale or trade." Despite the searches being automated, the authors acknowledged that significant human resources need to be committed towards fine-tuning the query methods and filtering the results. They described how the query parameters had to be well defined in order to return relevant search results, and they suggested that the types of information generated from automated searches such as theirs could be used for many other purposes, including identifying sites selling regulated organisms or species of interest, and monitoring internet sales of CITES-listed species (Suiter and Sferrazza, 2007)

3. MONITORING POSSIBILITIES

Automated internet searches for species offered for sale could assist with: i) determining which species are being advertised for sale; ii) determining the occurrence of new species advertised for sale; iii) monitoring trends/patterns of advertisements over time iv) and providing preliminary information to inform investigations by enforcement authorities.

In particular, automated searches could be used to: monitor (illegal) trade in Appendix I (Annex A) species; identify highly traded non-CITES species that may be candidates for listing in the EC Annexes and/or CITES Appendices; and investigate patterns and trends of wildlife trade over time in species groups (e.g. mammals, birds, reptiles, etc.), to determine 'fashion' trends, effects of blanket bans (e.g. bird ban), etc.

Two approaches are outlined below. The first involves general internet searches using pre-determined key words that have been selected to retrieve the most relevant results. The second approach involves targeted searches of pre-defined websites, again using a selection of key words. In each case there are a number of important caveats that must be considered when interpreting results and these are also outlined.

3.1. Technology

Google provides a programmable interface (Google RESTful API) that appears to provide a satisfactory level of flexibility and automation when making searches and retrieving results.

Species lists can be derived using the names in the UNEP-WCMC Species database and the search could recognize variations of the names (i.e. to cover misspelt names). Search results can be retrieved as a spreadsheet and can be therefore readily filtered and analyzed.

It should be noted that using Google (or any other search engine) implies acceptance of the search engine's 'relevance algorithm' to search and classify items, and also recognition of any inaccuracies in the way the search engine works.

3.2. General web monitoring

Automated queries using a search engine (such as Google) can be run across the entire World Wide Web using search terms (e.g. 'for sale', 'price list', 'Euros', etc.) and the names of the species of interest. The species names used in the automated searches could be derived directly from databases (e.g. CITES species database, the EU wildlife trade regulation database etc), or from a list of species provided by the user.

The search terms used could be selected according to the taxa targeted, e.g. 'reptile', 'snake', lizard', 'bird', 'birds of prey', 'falcon', 'parrot', 'for sale', 'price list', etc. If required, the search engine could limit searches to websites with particular country domains (e.g. domains of EU Member States). However, by limiting the search to specific country domains (e.g. from EU Member States), websites with general domains (e.g. .com, .net) would be missed. In addition, country-specific domains used by companies in other countries would be included.

Some non-relevant sites could be avoided by specifying to ignore certain domains (e.g. .org), types of hits (e.g. photographs) and specific sites (e.g. conservation/scientific sites).

- Main advantages:

- By targeting the entire World Wide Web, or sites from a selection of countries, a relatively complete picture could be obtained.

- 'Obscure' websites, those that do not normally advertise wildlife for sale, and one-off ads could be discovered.

- Main disadvantages:

- The maximum number of results that can be obtained with the Google API is 64 per species. However, these are likely to be the most relevant results and therefore should be sufficient if appropriate search terms are used.

- Results may include a higher number of irrelevant websites i.e. sites that are not run by retailers.

3.3. Website-specific monitoring

A list of websites offering wildlife for sale within the EU could be identified. Targeted searches could be used to monitor these sites periodically (e.g. once/twice a year/monthly). If linked to names of species in the UNEP-WCMC Species Database, automated searches could be used to record the occurrence of these species on each of the websites. If a search for a species has a hit within a targeted website, it is likely that the species will be advertised for sale within that website. A manual check could subsequently be performed to check whether this is really the case.

- Main advantages:

- By targeting websites known to offer wildlife for sale, the number of irrelevant hits is greatly reduced.

- If the most relevant websites are identified, this would allow a relatively good estimation of the total number of species of a particular taxon offered for sale within the EU. By comparing the search results over time, it would be possible to get some indication of the levels and trends of trade, as well as providing the ability to detect species new to the online market.

- Main disadvantages

- Not all websites are surveyed and therefore some relevant information could be missed, particularly from 'obscure' websites i.e. those that do not normally advertise wildlife for sale, and one-off ads.

- The initial identification of websites may be labour intensive.

- The appearance of new relevant websites would not be detected.

3.4. Combined approach

In order to maximize the advantages and minimize the disadvantages of the methods outlined above, a combined approach could be taken. An automated search using appropriate search terms could target the entire web (or country-specific domains) and the results of the search (or the most relevant results according to Google) could be manually checked to compile a comprehensive list of websites that would be later automatically monitored. In addition, Member States could provide links to relevant websites within their country to add to the list. On a yearly basis, the entire web could be

targeted again, excluding those websites already compiled, in order to identify any new relevant websites to add to the website-specific automatic monitoring.

4. CAVEATS

For each of the methodologies outlined above, there are a number of general caveats that need careful consideration:

- Strictly speaking, trade in wildlife cannot occur fully over the internet. Sales agreements and monetary exchange can, but the goods involved will still have to physically pass through international borders.

- Online offers of wildlife for sale might be scams and it is normally not possible to detect whether this is the case. In addition, even genuine offers might not result in a sales agreement and therefore in trade.

- It is not possible to determine whether specimens advertised for sale will be traded internationally or domestically (or whether, as mentioned above, they will be traded at all). For instance, specimens advertised in an Italian website are likely to find an Italian buyer and therefore international trade is not likely to occur.

- Any trends detected might not reflect real trends in trade but internet-related trends. For instance, an increase in the number of websites does not necessarily mean an increase in trade. It can simply mean that more shops are creating websites and/or that the web is becoming an increasingly popular marketplace.

- Online offers/ads often do not provide information on whether specimens in trade are wild harvested, origin of specimens, etc.

- When information is provided (e.g. on the taxon involved, the source and origin, legality, etc.), it is often not possible to verify whether it is correct.

- It is often not possible to determine how many specimens are for sale, or whether they are currently available. Therefore the number of specimens potentially in trade cannot be calculated.

- Sellers sometimes advertise the same specimens in a variety of websites, potentially leading to overestimations of availability.

- Ads may be left posted on the web long after the specimens stopped being available – also potentially leading to overestimations of availability.

- Use of common names, synonyms and misspelt scientific names complicates searches. While sophisticated searches can be designed to include synonyms and to recognize closely matching names, this has limitations.

- Illegal sellers have been reported to change the spelling of advertised specimens to avoid monitoring and to circumvent marketplace filters (IFAW, 2008; CITES Secretariat, 2009a).

5. CONCLUSIONS

The growing popularity of the internet globally and within the EU and the increasing number of commercial transactions being conducted online pose a challenge to the way trade in wildlife is monitored. While traded specimens still have to physically cross borders to be traded internationally, the agreement of sales online can stimulate this commerce. In addition, the anonymity associated with the internet, together with postal parcels as a common method of shipping goods acquired online, create ideal conditions for illegal and unreported trade to take place.

Web surveys can be used to investigate wildlife e-commerce and automated internet searches could be a practical means of conducting these surveys. There are, however, important limitations to what can be found through these searches and to how meaningful these findings are. Despite these drawbacks, automated internet searches can be useful to assess a number of variables, in particular:

- Which species are being offered for sale online, including identification of new species entering the market;

- An approximation of how often different species are being offered for sale online;

- Monitoring trends in availability of the species involved in the trade and of the relative popularity of each of these species on the web.

Different approaches can be used to monitor online wildlife trade through automated internet searches. Overall, the most efficient approach may be to target a comprehensive list of websites known to advertise wildlife for sale. While the first step in this process (to compile a list of websites from several countries and in several languages) may be relatively labour intensive, the results of automatically querying them would be relatively meaningful and comparable.

This targeted approach could be used by Member States to monitor national websites in order to identify any online advertisements of potential concern. An interface could be developed to facilitate CITES Authorities to tailor such searches to their needs, e.g. allowing the user to specify which websites to target, which search terms to use, etc. The outputs could then be analyzed by the user. This approach would ensure that the relevance of searches is maximized, that the effort of manually assessing results is more distributed and therefore manageable, and that users would be able to operate in the language of their national websites.

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