



Letter of Concern: Mining in the Lower Zambezi River Water Catchment and Protected Areas

INTRODUCTION

This petition is submitted to express the growing concern by the traditional residents of the Lower Zambezi Valley, the international conservation community, and local leaseholders in regard to the numerous proposed mining projects currently under development in the area. These projects are likely to impact the area's irreplaceable eco-system and cause irreversible damage to one of the greatest natural heritage areas in Zambia, and all of Africa. The mining projects are located both within and adjacent to the Lower Zambezi National Park, the recently formed Partnership Park (the first of its kind in Zambia which is a partnership between community and GMA leaseholders), and Mana Pools National Park, a World Heritage Site located directly across the river in neighboring Zimbabwe.

The area currently supports many communities in which thousands of local people depend on sustainable industries including agriculture, fisheries and tourism. As per the signatories document attached, you will see many of the communities are represented here. All of these communities and sustainable enterprises are under threat by the potential consequences of the proposed mining, which does not provide long-term economic benefits to Zambian citizens.

As a unique and world-renowned ecosystem with immense financial and ecological value to Zambia, this area deserves the highest level of protection. We are very concerned about the profound and long-lasting negative socio-economic and environmental impacts that are likely to occur if the proposed mining operations go forward.

The proposed open pit mining projects are located inside the Zambezi River water catchment, in close proximity to tributaries to this invaluable water resource. They are precariously located in a steep and highly erosive environment where even current best practice management is unlikely to sufficiently mitigate mining impacts. The mining projects are also located within Category I-IV Protected Areas and as stated, adjacent to a World Heritage Site, all of which fall under IUCN recommendations as "no go" mining areas. It is also a concern that uranium and other toxins released into the Zambezi as a result of the various mining operations could affect human and wildlife populations in the nearby neighboring countries of Zimbabwe and Mozambique, which also depend on the life line of the Zambezi.

Although the mining is currently “exploratory”, stakeholder reports from the invested mining companies and the rapid development of infrastructure to the proposed mining areas suggest that full mining operations are imminent, and there is already community concern about contaminated waste in mining sites and potentially related illnesses in workers.

BACKGROUND INFORMATION

Proposed Mining Operations

Public shareholder reports from the international mining corporations indicate that large deposits of ore have been found in the exploratory sites, and that mining will proceed. The companies undertaking the current exploration and development include: Zambezi Resources, (partners are Glencore Mining of Switzerland, First Quantum Mining based in Australia, and Rio Tinto Zinc also based in Australia), and Albion mining of Australia which is operating in association with Africa Energy Resources in Zambia.

Mining company Zambezi Resources and their partners are currently well into the exploration stage of mining operations in southern Zambia, focused on three key project sites, incorporating two copper/gold projects and two uranium joint venture projects.

Their primary projects are:

- 1) The Kangaluwi Copper/Gold Project, *located inside the Lower Zambezi National Park (LZNP)*. This project is 100% owned by Zambezi Resources and is the site of rapidly expanding exploration, including a major resource drill out project during 2008/ 2009. It is reported by the developer to be a “world class open pit copper deposit¹” and a “company-making project²”. Figure 2 below illustrates the geographical location of the site in the escarpment, showing its elevation in the catchment and immediate proximity to important tributaries to the Zambezi River. Several million dollars has already been spent on Phase I of the mining exploration and extensive infrastructure and a broad PR/outreach effort to win local community support has been implemented.
- 2) *Located in the Chiawa Game Management Area (GMA) soon to be re-classified as Zambia’s first Partnership Park*, is the Chiawa Copper/Gold Project. This is a joint venture with Glencore International (now combined with the Chongwe Copper Belt Project³). The Chumbwe and Mpande areas also located in the Chiawa GMA are included in a Uranium Joint Venture with Lithic Metals and Energy, along with Mulungushi and Rufunsa licences⁴.
- 3) The Mulofwe Project, *located in the river catchment above the Chiawa GMA and LZNP*, a Uranium Joint Venture with Rio Tinto Zinc⁵.
- 4) A fourth area of concern is the mining operation in Siavonga at exploration stage by Zambezi Resources and in more advanced stages by OMEGA, situated *in the catchment directly above Lake Kariba, the largest single water source in Southern Africa after to Lake Malawi*.

Other exploratory projects at different stages are outlined in Figure 3 below.



Figure 1. General location of proposed mining area in Zambia.

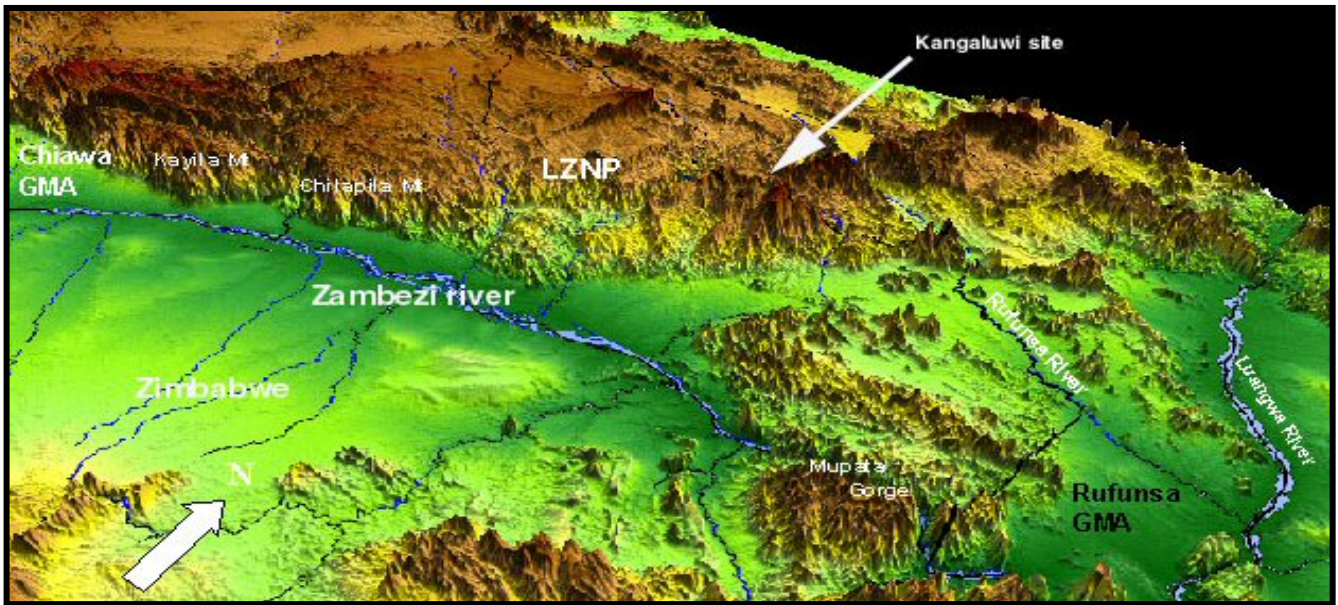


Figure 2. Introductory map showing the topography of the Lower Zambezi National Park, and the location of the Kangaluwi exploration site on the escarpment inside the National Park (map provided by Zambezi Resources). Mana Pools World Heritage Site lies directly across the river in Zimbabwe.

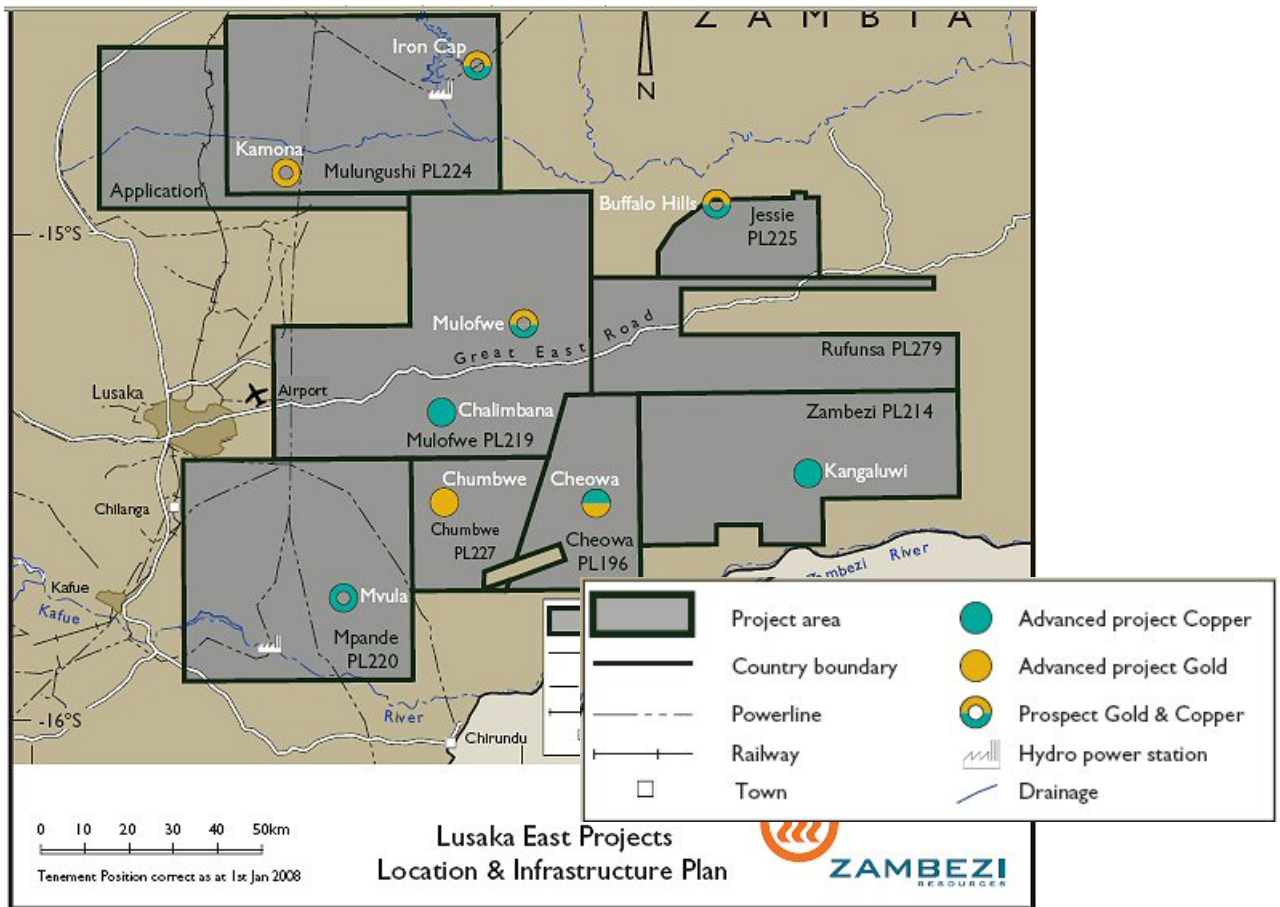


Figure 3. Zambezi Resources Project Locations⁵

AREAS OF CONCERN

1. Socio-Economic and Health Implications

The mining sites lie in the heart of the Zambezi River basin on the Zambian side of the river. The immediate area supports a cross-border human population estimated conservatively at over 800,000 people, 320,000 of which live on the Zambian side. These numbers do not include populations at risk from potential downstream effects of pollution related to uranium mining or other mining contaminants, which could also affect Mozambique. The risk of contamination of soils, groundwater, surface runoff and alluvial systems from open pit copper mining and other activities pose a serious risk of damaging the sustainable industries currently in place in the area. These include subsistence farming and fishing upon which many local communities are dependent, as well as larger scale industries of high economic value such as commercial fisheries, agriculture, and tourism activities built around wildlife conservation and protected area management.

All of these industries are dependent on the Zambezi River and/or the wildlife it supports, and all are industries which have been encouraged under Zambia's policy of economic diversification which aims to reduce Zambia's economic dependency on copper mining. Clearly the proposed mining projects represent a conflict of interest against the continuation of these other, more sustainable industries. Mining utilizes a finite resource, has relatively short term viability and post-mining impacts may be of

sufficient scope that these sustainable industries will no longer be viable. Additionally, the vast majority of profit from the unsustainable mining industry will primarily benefit foreign investors.

Conflict of interest between sustainable and non-sustainable industries: The mines are likely to employ a few hundred local people at each mine site who will be employed as unskilled manual labor (the Uranium mine in Siavonga gives a best estimate of employing only 500 people in total). Skilled workers will be brought in from other areas or countries, therefore much of the mining economy will not benefit the local economy. Again, any employment from mining will be short term relative to the other sustainable local industries; the mines are estimated to have a life of only ten years at best.

In comparison, the local sustainable industries that would be impacted from mining environmental contamination include:

- **Agriculture**, which employs over 1100 people in the Lower Zambezi area, plus another 3000 seasonal workers. Approximately 20,000 people also rely heavily on subsistence agriculture in the Lower Zambezi area alone.
- **Tourism**, which employs over 800 people in the Lower Zambezi and Kariba Lake areas in Zambia, plus several hundred on the Zimbabwe side of the Lake. The Lower Zambezi GMAs and National Park constitute one of Africa's most valuable and beautiful wildlife areas. The National Park is a flagship park for Zambia, generating the third highest Park revenue through its wildlife/tourism industry, which is in the top three economic sectors for Zambia and has undergone rapid growth in the last five years²⁴. The Lower Zambezi area alone directly employs over 500 local people in the 25 lodges currently established in the area.
- **Fisheries:** There are three commercial fish farm operations at risk on Lake Kariba; Freshnet Fish Farms, Kariba Bream Farm, and Lake Kariba fish farm. However the majority of fishery employment is artisanal (traditional) rather than industrial and there are 98 registered kapenta fishery operators on the Lake, plus over 2000 fishers using dugouts and nets in the Lower Zambezi and Lake Kariba areas.

1.2 Health Risks. There are obvious, well established human health concerns arising from acid and heavy metal contamination of the environment from open-pit and other mining activities. These negative outcomes are not uncommon and the very nature of the Zambezi escarpment makes the area particularly vulnerable to these risks. The broader effects of Acid Mine Drainage are explained in Section 2 below. The proposed uranium mines also have additional associated severe health risks. These include: radiation risks for on-site workers; contamination of airborne dust, and transport of radon and other radionuclides through surface water resulting in ingestion and bioaccumulation in plants, animals and humans near the site; and bioaccumulation by aquatic species from contaminated runoff, that then passes up the food chain. Cancer is the most established major effect from radionuclide exposure, but other health risks include respiratory effects, and organ damage²¹.



These risks are well known and readily associated with uranium mining, however well managed, and thus risk **perception** alone could do real damage to both agriculture and tourism industries.

Even if safety and waste management policies are strictly implemented and monitored, contamination from uranium mining can occur through accidents, as has been demonstrated in many sites world wide, and would have devastating effects on the immediate area. Due to the mining sites' proximity to the Zambezi River, contamination could also feasibly affect Zimbabwe and Mozambique. The Zambezi flows through Cahora Bassa dam, serving thousands of Mozambicans, and ends at Mozambique's coastline where it meets the Indian Ocean which is home to some of the world's greatest reefs and most significant populations of sea life.

2. Related Environmental Impact Concerns

A key concern is that Zambezi Resources proposed mining sites lie not only within Zambian Protected Areas but also in elevated positions in the Zambezi Escarpment; a critical water-catchment for the Zambezi River and an area which undergoes highly erosive processes due to its seasonal heavy rainfall. Mining is heavily water dependent and open pit mining could potentially have substantial environmental impacts. These impacts can be mitigated in some environments, but in a steep and erosive water catchment the likely in-situ and downstream impacts are dramatically increased. Below are listed areas of critical concern for consideration of potential mining impacts in this area. These are risk scenarios that have occurred in other similar mining sites in developing countries, and although they are not foregone conclusions they should be carefully considered as possible outcomes from mining in the Lower Zambezi environment, and should be carefully incorporated into decision making processes for prevention of these impacts.

2.1 Acids and Toxins: Open pit mining utilizes large containment ponds, which become permanent lakes, for management of tailings which are both acidic and toxic. Containment of toxins in the proposed highly sensitive areas will be difficult to impossible even with the most stringent of safety precautions being implemented, because the mines sites are located in an erosive environment and elevated in the water catchment. Even if tailings are processed off site there are significant risks of contamination. This is of great concern given the proximity to important water sources.

The natural oxidation of waste ore and tailings from open pit mines can generate acids and metal toxins, a process called Acid Mine Drainage, which can persist for centuries¹². Copper ore itself is a major source of this acidic contaminant making copper mines a particular source of concern for this problem. Acid Mine Drainage is a well established contamination problem for soil in runoff areas, groundwater and aquatic systems^{13,14,15}. Acid Mine Drainage has been found to disrupt the structure and function of aquatic ecosystems, and affects not only the water column and fish but sediment and associated species, groundwater^{16,17}, and results in long-term contamination of these systems¹⁴. Remediation of Acid Mine Drainage is extremely difficult to implement^{18,19,20}. If gold mining is included as proposed, and processed on site, tailings may also include cyanide which is a highly toxic potential environmental contaminant.

In addition to typical Acid Mine Drainage, the processing stages of copper, gold and uranium normally involve extraction by the use of sulphuric acid (a technique proposed by at least two of the mining companies), which then becomes part of waste water and a potential environmental contaminant. The level of metals in the waste water from mining is also toxic to the environment, including copper and nickel.

2.2 Deforestation: Zambezi Resources has already acknowledged in writing that deforestation and charcoal production has increased due to their road upgrades for exploratory site access, and this is likely to increase in scale as mining exploration and development continues. Of greater concern is that open pit mining will entail large scale deforestation since it removes all surface materials and generally expands until the resource being mined runs out. Even with best practice environmental management standards in place, deforestation and removing surface soil and rock in the steep escarpment area is highly likely to increase **instability, erosion, siltation of tributaries and the main river**, and result in **water pollution**. Any rehabilitation efforts post-mining could be compromised by the steep nature of the terrain being difficult to stabilize and re-vegetate.

3) International Agreements against Mining in Protected Areas.

The proposed mining area lies within the terrestrial eco-region of Zambezi and Mopane Woodlands which supports some of the most significant wildlife populations in Africa⁶. Elephant and buffalo populations are particularly healthy. More specifically the region contains the Middle Zambezi-Luangwa freshwater eco-region between Kariba and Cahora Bassa dams⁷, and downstream from Cahora Bassa through Mozambique to the Indian Ocean is designated as the Lower Zambezi freshwater eco-region⁸. Directly across the Zambezi River from the mine sites, in the same water-catchment, lies the World Heritage site of Mana Pools National Park.

In accordance with IUCN recommendations, the International Council for Mines and Metals (ICMM) has undertaken “not to explore or mine in World Heritage properties. All possible steps will be taken to ensure that existing operations in World Heritage properties as well as existing and future operations **adjacent to** World Heritage properties are not incompatible with the outstanding universal value for which these properties are listed and do not put the integrity of these properties at risk”⁹. The proximity of the mines to the World Heritage Site elevates the level of concern from a local to an international issue.

In 2000 the IUCN put forward recommendations that governments should forbid mining in Category 1-IV Protected Areas¹⁰. The Lower Zambezi National Park, and potentially the affected GMAs, fall under these categories¹¹. The ICMM has also acknowledged that exploration and mining may be incompatible with the objectives for which these areas are designated for protection⁹.

We are concerned that this is indeed a situation where exploration and mining are incompatible with the objectives for which the Lower Zambezi National Park and GMA's have been designated as according to the ZAWA Wildlife Act (No 12 of 1998). Further to that, we are concerned that the mining operations, even if working under standards of international best practice, are likely to have substantial impacts on the Zambezi River basin and its inhabitants.

4) International Conservation Relevance

The detrimental effects of environmental contamination will have serious consequences for the area's large local human population as well as for its immense wildlife populations. In addition to providing a platform for a highly successful and sustainable tourism industry, the protected areas where the mining operations are located also have international conservation significance. The known IUCN Red Listed species occurring inside the potential mining impact area are listed in Table 1 below²². The table

includes only the species which are listed under IUCN “threatened” species categories, all of which already face a high to extremely high risk of extinction in the wild; ie those that are critically endangered (CR), endangered (EN) or vulnerable (VU).

Table 1. Known IUCN Red Listed species occurring the Lower Zambezi area.

Common Name	Scientific Name	Red List category and criteria (ver 3.1 2001)
Kariba tilapia	Oreochromis mortimer	Cr A2ae
African wild dog	Lycaon pictus	En C2a(i)
Marsh Mongoose	Herpestes palustris	En B1+2abcd
African lion	Panthera leo	VU A2abcd
Common Hippopotamus	Hippopotamus amphibious	VU A4cd
African elephant	Loxodonta africana	VU A2a
Lappet-faced vulture	Torgos tracheliotos	VU C2a(ii)
White-headed vulture	Trigonoceps occipitalis	VU C2a(ii)
Harrison's Fruit bat	Lissonycteris goliath	VU A3c +4c
Threespot tilapia	Oreochromis andersonii	VU A3e

The localized Lower Zambezi National Park area supports over 40 species of fish⁸ and more than 400 bird species, with 12 bird species of global conservation concern²³. Due to the paucity of ecological data on the diversity and distribution of species in the area it is likely that there are many more unreported threatened species within the protected areas, including molluscs, amphibians, insects and smaller mammals (chiroptera species etc).

New road infrastructure to the mines, combined with large numbers of people living and working inside protected areas has the potential to dramatically increase illegal poaching of wildlife, which is already an important wildlife management problem for the area. It should be noted that since the inception of the mining exploration and consequent building of new roads into the area, commercial elephant poaching has doubled.

CONCLUSION

The ZAWA (Zambian Wildlife Authority) Act clearly states that no mining right be granted that does not take into account the need to conserve and protect “the air, water, soil, flora, fauna, fish, fisheries and scenic attractions in or on the land”. All of these will potentially be impacted by this mining operation. We feel it is essential that any determination of acceptable impacts during the process of an Environmental Impact Assessment (EIA) takes into account the above information relating to socio-economic concerns, ecological sensitivity, and the local and international environmental significance of one of Zambia’s most valuable natural resources. We request that the Environmental Council of Zambia enforces strict implementation of the Environmental Protection and Pollution Control Act

(EPPCA) in this case, and insists on a thorough EIA with a full public consultation process and that all concerns listed above are addressed in the EIA through this process.

Clearly mining is an essential component of the economic development of Zambia, but also clear is that it is not the industry of choice in all areas and that special areas require special consideration. Other commercial, sustainable industries must be considered as first priority in some locations, particularly when development conflicts with sustainable industries and the overall well being of communities and valuable natural heritage areas. If mining compromises or puts at risk natural resources and the sustainability of critical eco-systems we believe it should not be considered a viable industry for development.

The decision whether or not to permit mining in or around the Lower Zambezi National Park and adjacent protected areas puts Zambia's people and economies at a historic crossroads: the country can decide to be a model for sub-Saharan Africa and the world by continuing to recognize the outstanding economic value of sustainable enterprises, and acknowledge the special value tourism offers in terms of economic sustainability, training, and jobs through proper stewardship of the country's outstanding ecological resources. Or alternatively, like other countries who have depleted their resources and compromised their economic sustainability, Zambia can choose to allow foreign corporations to risk its natural heritage while they reap profits from providing short-term, unskilled labour jobs for Zambians and potentially inflict irreversible negative ecological, human health and economic impacts over the long-term.

The choice is there to be made and the community, industry and international signatories to this letter encourage those individuals who act as Zambia's custodians, from the highest government officials to ZAWA and the Ministers of Commerce, Mining, and the Environment and Tourism, to move forward in the dynamic development of its diverse industries. We urge the progressive government of Zambia to continue with its wise, far sighted policy of protection and development of its world-class wilderness resources and affirm our support in the protection and preservation of its increasingly valuable wildlife areas. We urge the government to encourage the development of the sustainable economies that depend upon these ecological treasures, if need be by opposing these proposed mining operations and providing for special legal designation of high value natural heritage areas. Given the above illustrated risks for human health and communities, sustainable industries, and the ecosystem, we urge that the onus be placed on the mining companies to provide evidence of responsible risk management and appropriate resource allocation for mitigation of contaminants should accidents occur or in the event of insufficient environmental management.

We respectfully ask the government to consider implementation of special restrictions for these fragile eco-systems. In light of these serious concerns we request that

- 1) a thorough EIA is carried out as according to the EPPCA and accompanying pollution control regulations (including water pollution and hazardous waste), by an internationally recognized and creditable independent party, to be critiqued and approved by signatories of this petition and ZAWA authorities.

- 2) all further mining development and exploration expansions are discontinued until the time that such an EIA can be completed and submitted for evaluation by the Environmental Council of Zambia, in conjunction with expert advisors selected by the ECZ who will be made available for comment on the study to the undersigned international conservation organisations. We also request copies of any baseline studies already performed by the mining companies and submitted to the Environmental Council of Zambia.

3) the Zambian Government relinquish mining concessions that have been allocated within IUCN Category I-IV Protected Areas as per international recommendations.

See attached document for signatories.

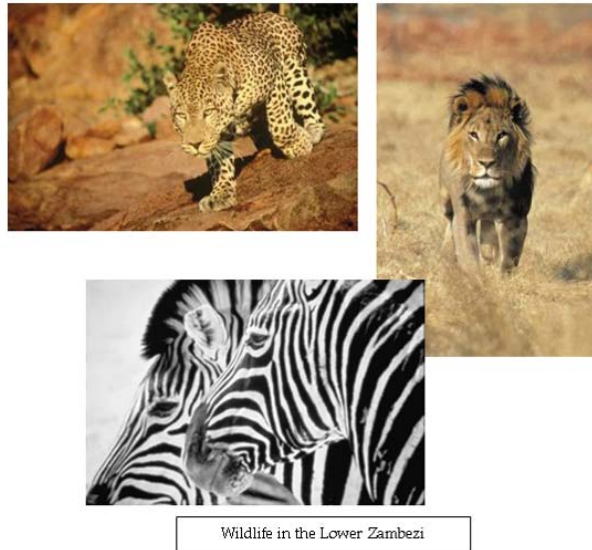
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5. Figure entirely taken from: 2008 Zambezi Resources: Taking on the Resource Development Challenge (Corporate Information Document). Accessed online 24th July, http://www.zambeziresources.com/_content/documents/699.pdf

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