Proofreading example – changes visible

STINN TRANSLATIONS
Translation - Editing - Proofreading

1 Introduction

Conservation and management of wildlife populations require regular monitoring as well as the estimation of wildlife densities and information on factors that affect abundance over time (Laing et al. 2003, Jachmann 2012). Some species are difficult to detect in the field because the species are either very elusive, their populations are very small, or they occur in densely vegetated habitats (Zero et al. 2013).

The Siberian red deer (*Cervus canadensis sibiricus*), also known as the maral, is a subspecies of the North American elk (*Cervus canadensis*). Indeed, it exists throughout northern Mongolia and parts of North Asia. Until recently, this ungulate was actually able to be found in high densities in forests and in parts of the steppe regions that exhibited a high vegetation cover that made it sufficient for their use. An assessment done in Mongolia in 1986 resulted in a population estimated at 130,000 individuals across 115,000 km^2 (Dulamtseren et al. 1989). The most recent estimation by the Mongolian government estimated the population at 8,000 to 10,000 individuals, which represents a 92 % decline over the past 18 years (Zahler et al. 2004). Resulting from the low population size, the ungulate is listed as Rare under the 1995 Mongolian hunting law. Based on International Union for the Conservation of Nature (IUCN) Red List Guidelines, the Siberian red deer is "Critically Endangered" in Mongolia due to the drastic population decline, habitat loss, and exploitation (Clark *et al.* 2006). But no recent population information is available on the Siberian red deer in Mongolia.

For deer (*Cervus ssp.)*, direct counts are most helpful in open areas where the animals are more easily findable than in dense vegetation (Smart et al. 2004). In forests and dense shrublands, reliable estimates from direct counts are harder to obtain (Marques et al. 2001). Direct count methods also sometimes calculate animal densities at the time of the survey, which could lead to wrong estimates (Jachmann 1991).

Indirect surveys like dung counts record the presents of a species across a period of time prior to the survey. They give animal abundance estimates and density estimates that are comparable to using direct methods (Barnes 2001) and could be used to assess the population status (Bailey and Putman 1981). For the monitoring of deer in patchwork habitats, dung counts tend to be the preferred survey method (Buckland et al. 2001). The fecal standing crop (FSC) method has been found to be the most cost effective and efficient fecal count method to estimate deer numbers, particularly in small populations (Laing et al. 2003; Alves et al. 2013). FSC estimates animal density on the basis of the amount of recorded dung samples, dung decay rate, and dung production rate (Hemami & Dolman 2005). Dung decay rates tend to

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Commented [CS1]: You need to use the plural here as you are referring to conservation and management (two items).

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Commented [CS2]: Be careful with the different spellings of the verb "to affect" (=to influence) and the noun "effect" (=impression or resulting action).

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Commented [CS3]: Common names of animals and plants are generally not capitalized in English unless part of the name includes the name of a place or person (see also my next comment).

Commented [CS4]: You need to capitalize "North" here because it is part of the geographical name (North American elk).

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Commented [CS5]: Here you are referring to the cardinal direction, used as an adjective, so you need to use lowercase letters. If this was the actual name of the place (e.g., South America or North Pole), then you would need to capitalize it.

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Commented [CS7]: Spell out the full term whenever you use an acronym for the first time in your text and introduce the acronym in parentheses.

Proofreading example – changes visible

vary across habitats, seasonality, and climates (Laing et al. 2003, Skarin 2003, Hemami & Dolman 2005). Estimation of dung decay usually requires repeated visits to dung samples with a known deposition time over a long period of time and across different habitats. An advantage of the FSC method is that it is possible to develop a model to predict decay rate instead of having to conduct a decay rate experiment at every survey site at every time point (Laing et al. 2003). Moreover, it doesn't require distance measurements, and all dung detections in the survey transect are recorded, regardless of how old they are (Laing et al. 2003). Similar to dung decay, dung production (or its opposite, defecation rate) varies by season, habitat quality, and sex/age of individuals (Eberhardt and Van Etten 1956; Mitchell et al. 1985). Defecation rates are therefore ideally estimated for each population before the survey is done. To estimate defecation rate (in pellet groups per individual per day), a known group of individuals in an enclosed area which was previously cleared of all dungs is observed over a fixed span of time. At the end, the total number of pellet groups are counted to determine the daily number of defecations per individual.

While ground surveys have been cheaper than traditional aerial surveys, they are very time-intensive and cover only small areas. And for very small or sparse distributed populations, a high survey effort is important to calculate reliable estimates (Bouché et al. 2012). Manned aerial surveys are traditionally used as a wildlife monitoring method; however, they are very expensive and logistically challenging. Resulting from these limitations, survey intervals are long for many populations (Dunham 2012).

Over the past decade, an emerging market of non-military, unmanned aerial vehicles (UAV) with high-quality cameras and precision flight capability with a global positioning system (GPS) has been made available to everyone. Also known as drones, they are becoming increasingly promising and affordable tools to conduct wildlife surveys (Pierce Jones IV et al. 2006, Koh and Wich 2012, Anderson and Gaston 2013, Christie et al. 2016). Their main benefits are that they can be used for hard-to-reach populations and places, are much cheaper, more safe to operate, and less invasive than manned aircraft (Watts et al. 2010, Anderson and Gaston 2013, Hodgson et al. 2016).

In my study, the abundance and density of a Siberian red deer *Cervus canadensis sibiricus* population in northern Mongolia is estimated using the FSC method. In addition, aerial imagery obtained with a drone will be used to assess the preciseness and efficiency of this method for population estimations. The results thus provide crucial information on the current population status of the Siberian red deer in northern Mongolia in a protected area. In addition, this is also the first study to assess the applicability of a low-noise, consumer-grade drone for a wildlife census.

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Commented [CS10]: This is a proper noun and must therefore be capitalized.

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Commented [CS12]: Scientific names are often written in italics, which is also what you did earlier in your introduction.
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