MAPPING BEAR DISTRIBUTIONS: MESHING HARD DATA AND EXPERT OPINION[1]

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ABSTRACT

Delineating the geographic range of species and populations is fundamental to understanding ecological and human-imposed limits on distribution, planning coordinated range-wide conservation efforts, and monitoring effects of conservation initiatives, or the lack thereof. Beginning in late 2006, we collaborated with 67 national experts (on bears and other wildlife) from throughout Asia on a project to demarcate the past and current ranges of 4 species of Asian bears (*Ursus arctos, U. thibetanus, Melursus ursinus, Helarctos malayanus*) using a modified version of the range-wide priority-setting methodology that has been previously applied to a number of other species. Published maps and expert knowledge were utilized to define the historic ranges of these species, which spanned 35 countries. We then asked the experts to provide known, recent point locations of bears (from sightings, photos, kills, definitive sign, etc.) from their geographical area of expertise, and from these, delineate areas of definite occupied range, probable range, extirpated range, and remaining "unknown" areas within the historic range, following definitions that we provided. A workshop was subsequently convened where the experts could confer with others from their own and neighboring countries to revise their preliminary range maps. After the workshop, we produced revised maps, which were sent back to the experts for review, clarification, and further revision. Ultimately, an up-to-date range map was created, including metadata for each point location and expert-derived range polygon. What became clear and interesting, however, is how differently experts treated their own data and interpreted the defined range categories. On one extreme, definite range was ascribed only to specific reserves where bears were known to occur, whereas all areas outside reserves without recent point observations were considered extirpated. On the other extreme, some experts filled in large areas of probable or even definite range well beyond the extent of their point data. Only a few experts made use of the "unknown" category. These disparities may well be real, as countries differ enormously in suitability of habitat in the areas outside reserves, and also in the extent of existing knowledge about these areas. But it is also apparent that the mapping was influenced by differing personalities of the experts, their level (or self-perceived level) of expertise, and their culture. We discuss the implications of these factors in terms of ecological understanding and conservation monitoring, and compare the pros and cons of expert-based range mapping to a habitat modeling-based mapping approach.