Electronic Supplementary Material 2: Spatial landscape data – motivation and predictions

We considered three groups of spatial landscape variables in our analyses; i.e., land cover data, distance to human footprint variables, and the Normalized Difference Vegetation Index. We chose not to include other potentially relevant covariates for animal habitat selection in the candidate models (e.g. topography, distance to habitat edges, patch sizes, etc.), because our main focus was on the land cover data and the human footprint-related variables and because we wanted to avoid overfitting the models [1].

<u>Land cover</u>

Bog and tree-rich bog – Bogs and tree-rich bogs are among the least productive habitat types in the boreal forest in terms of living conditions or foods for many species, including large mammals [2, 3]. Several studies have suggested that female brown bears with dependent offspring avoid high-quality habitat in terms of foraging and energy gain (e.g., prime salmon spawing streams) [4-7], and that trait-mediated effects of infanticide can have a nutritive cost [8, 9]. Because bogs and tree-rich bogs have little to offer in terms of food for solitary adult females and the adult males that associate with them during the mating season [10, 11], we expected that bogs and tree-rich bogs would provide relatively safe habitat for mothers with a dependent litter. Consequently, we expected that successful mothers (i.e. no litter loss during the mating season) would have selected for bogs and tree rich-bogs and that unsuccessful females would have avoided these land cover types.

*Clearcut*s –We expected that successful mothers would have shown strong positive selection for clearcuts, whereas we expected strong avoidance of clearcuts by unsuccessful mothers. Three complementary mechanism form the basis for this prediction. First, besides carpenter ants

(*Camponotus herculeanus)* [12] and some early herbs, grasses, and sedges, recent clearcuts (< 10 years old) have little to offer in terms of food resources for bears during the mating season. Second, previous research in our study area indicated that solitary females and adult males select for densely vegetated habitat patches that provide much cover, presumably to avoid being detected by humans [13, 14]. Females with dependent offspring, however, appeared to select for less dense vegetation, presumably to avoid infanticidal males [11]. Third, recent clearcuts may reflect a stronger human footprint than older forests types, bogs, and tree-rich bogs [15], and adult males and solitary adult females seem to be most sensitive towards human footprint-related landscape features [11, 16, 17]. In summary, we expect that clearcuts would be strongly avoided by solitary females and the males that associate with them during the mating season, because clearcuts are poor habitat in terms of food resources and cover, and have a strong human footprint. Consequently, clearcuts can provide relatively safe habitat for successful mothers, and mothers that had avoided clearcuts were expected to have higher odds of losing their litter due to SSI.

Young forest – Young forest types are typically dense and provide much cover. Previous research in our study area showed that young forest is a highly selected resource for solitary females and adult males during daytime throughout the year, presumably to minimize the risk of disturbance by humans [11, 13, 14, 18]. Because we expect that avoiding conspecifics to reduce the risk for SSI can pay off in terms of offspring survival, we expected that successful mothers would have more strongly avoided young forest than unsuccessful mothers.

Mid-aged and old forest – Brown bear cubs often climb trees when sudden risk appears, for example when approached by humans or conspecifics [11, 19]. The availability of large trees may thus be a critical resource to facilitate escape from SSI for mothers and their litters. Such trees are more common in more mature forest stands. Therefore, we expected that successful mothers would have more strongly selected for mid-aged and especially old forest types compared to unsuccessful mothers.

Human footprints

As outlined in the main body of our article, we expect that successful mothers associate with humans to reduce the risk for SSI. We considered roads, forest roads, and human habitation (buildings, settlements, villages) as landscape features with a strong human footprint. We distinguished between these three landscape features, because of their varying predictability of human activity, since predictability of a risk or disturbance can be an important cue for animals to adjust their behavior and space use [20-22]. We assumed that human activity is relatively constant and predictable around habitation, less constant but relatively predictable around paved roads with regular motorized traffic, and relatively low and unpredictable on unpaved forest roads. Consequently, we expected that successful mothers would have selected for areas close to, in order of relevance, human habitation, roads, and forest roads. We expected that unsuccessful mothers would generally have avoided these land cover types.

NDVI

The spectral normalized difference vegetation index (NDVI) is a proxy for vegetation density and thus cover [23]. Several wildlife ecological studies have now shown the relevance of NDVI for animal behavior [24, 25], including brown bears [26, 27]. Our previous research indicated that solitary females and adult males strongly select for patches with high NDVI values, especially during daytime [11]. Selection for patches with high NDVI values by successful mothers was stable throughout the day, and lower compared to conspecifics. We previously explained this behavioral difference as a spatiotemporal anti-SSI strategy. Here, we expected that unsuccessful mothers had selected for patches with higher NDVI values than successful mothers.

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