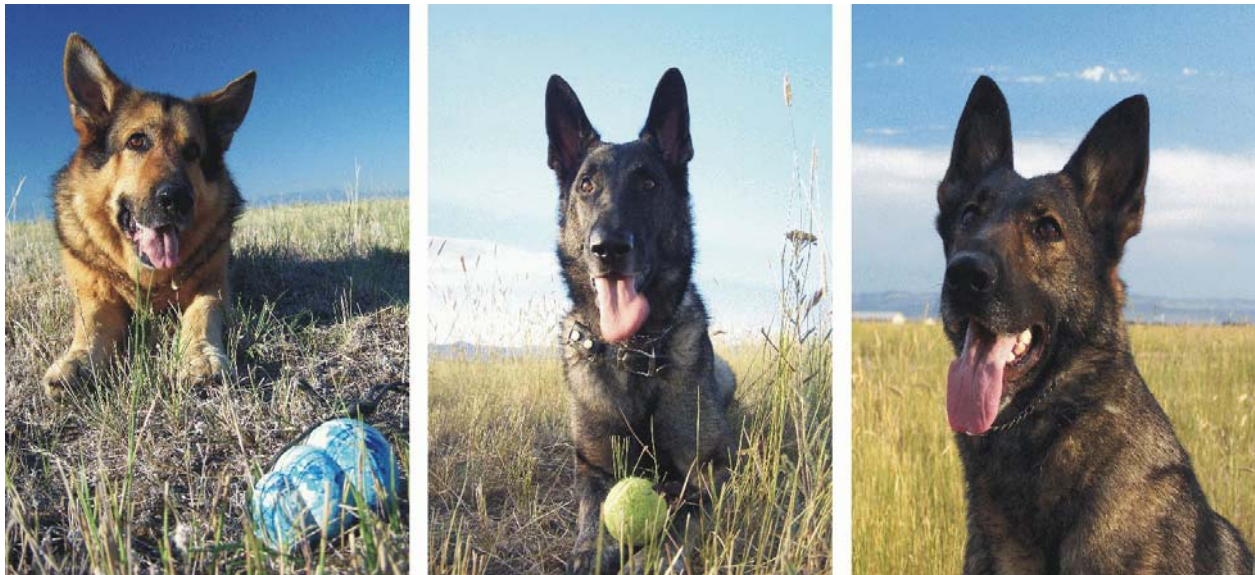


## Utilization of canines for detecting spotted knapweed invasions

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Spotted knapweed (*Centaurea maculosa* Lam.) spread may be facilitated by small populations that go undetected and influence further invasion. New strategies are needed to detect isolated plants and small patches to prevent spread and maximize the chances of eradication success. Canines (*Canis familiaris* L.) are an effective detection technology for a variety of targets. Our objective was to compare the accuracies, search durations, and detection distances of canines to human surveyors in locating rare incursions of spotted knapweed. Three canines, trained to detect spotted knapweed with narcotics detection and tracking techniques, were compared to humans with spotted knapweed survey experience. Seven field sites (0.5 ha) were delineated in a grazed dryland pasture dominated by crested wheatgrass (*Agropyron cristatum* [L.] Gaertn.). Canines, with their handlers, and human surveyors performed open grid searches during fall 2005 and spring and summer 2006. The mean accuracies of canines in detecting spotted knapweed incursions were significantly ( $P < 0.05$ ) better than humans during the fall (85.7% vs. 63.5%) and summer (92.1% vs. 76.2%). Mean spring accuracy of canines (76.2%) was only marginally better ( $P < 0.10$ ) than for humans (61.1%). Mean fall search duration for canines was faster than humans, but similar for the spring and summer trials. Mean fall detection distance of canines (6.5 m) was not different from humans (4.1 m). Spring and summer detection distances were significantly greater for canines (6.3 m) than for humans (3.1 m). Our results indicate trained canines are more accurate than humans at locating new invasions of spotted knapweed. Surveys using trained canines may be effective for detection of rare spotted knapweed.



Spotted knapweed detector dogs: Rio, 8-year old male German shepherd (Debbie Smith, handler); Tsavo, 5-year old male German shepherd (Alice Whitelaw, handler); and Nightmare, 3-year old female Rocky Mountain shepherd (Charles Whelan, handler).