Important fitness components for successful pack hike performance

M. Phillips¹, C.R. Abbiss¹, W. Payne², D. Nichols³ and B. Aisbett¹

¹School of Exercise and Nutrition Sciences, Deakin University, Victoria
²School of Human Movement and Sports Science, University of Ballarat, Victoria
³Country Fire Authority, Victoria

INTRODUCTION
The Pack Hike Test is a physical competency test designed to quantify the capacity of firefighters muscular endurance, strength and cardiovascular fitness. The fitness components that best predict pack hike performance are unclear. Thus the physical training to best prepare recruits is not known. The purpose of this study was to examine the relationship between physiological characteristics, demographics and pack hike performance.

METHODS
Fifty-nine Western Australian Fire and Emergency Services Authority (FESA) volunteers (n=17), FESA career (n=22) and Department of Environmental Conservation Land Management (n=20) personnel were recruited for this study (mean±SD; 179±7cm; 83±10kg; 40±11y). Participants performed a series of muscular endurance, muscular strength and cardiovascular fitness tests. All participants also completed the Pack Hike Test which involved a 4.83-km (3-mile) hike over level terrain wearing a 20.4kg vest in 45 min.

RESULTS
• Pack Hike Test performance time was significantly different between DEC personnel, FESA career and FESA volunteer firefighters (Figure 1)
• 61%, 10% and 0% of FESA volunteers, DEC staff and FESA career personnel failed (>45 min) the pack hike test, respectively
• Measures of cardiovascular fitness, upper body muscular endurance and body composition were good predictors of performance in DEC staff and FESA volunteers but not FESA career personnel (Table 1)
• The pack hike performance of FESA career personnel was most closely related to prone bridge hold (Table 1)

CONCLUSIONS
The major findings from this study were that:
• pack hike performance differs between DEC staff, FESA volunteers and FESA permanent firefighters,
• the predictors of pack hike performance for DEC staff and FESA volunteer firefighters appear to be cardiovascular fitness, upper body muscular endurance and body composition,
• performance of FESA career personnel was best predicted by prone bridge hold.

These findings may provide information to assist in the preparation of recruits and/or screen of personnel prior to partaking in the pack hike test.