Long-term success of ongoing malaria control efforts based on mosquito bed nets (long-lasting insecticidal net) and indoor residual spraying is dependent on continuous monitoring of mosquito vectors, and thus on effective mosquito sampling tools. The objective of our study was to identify the most efficient mosquito sampling tool(s) for routine vector surveillance for malaria and lymphatic filariasis transmission in coastal Kenya. We evaluated relative efficacy of five collection methods--light traps associated with a person sleeping under a net, pyrethrum spray catches, Prokopack aspirator, clay pots, and urine-baited traps--in four villages representing three ecological settings along the south coast of Kenya. Of the five methods, light traps were the most efficient for collecting female Anopheles gambiae s.l. (Giles) (Diptera: Culicidae) and Anopheles funestus (Giles) (Diptera: Culicidae) mosquitoes, whereas the Prokopack aspirator was most efficient in collecting Culex quinquefasciatus (Say) (Diptera: Culicidae) and other culicines. With the low vector densities here, and across much of sub-Saharan Africa, wherever malaria interventions, long-lasting insecticidal nets, and/or indoor residual spraying are in place, the use of a single mosquito collection method will not be sufficient to achieve a representative sample of mosquito population structure. Light traps will remain a relevant tool for host-seeking mosquitoes, especially in the absence of human landing catches. For a fair representation of the indoor mosquito population, light traps will have to be supplemented with aspirator use, which has potential for routine monitoring of indoor resting mosquitoes, and can substitute the more labor-intensive and intrusive pyrethrum spray catches. There are still no sufficiently efficient mosquito collection methods for sampling outdoor mosquitoes, particularly those that are bloodfed.