Data from a new, wide field, coincident optical and X-ray survey, the X-ray Dark Cluster Survey (XDCS) are presented. This survey comprises simultaneous and independent searches for clusters of galaxies in the optical and X-ray passbands. Optical cluster detection algorithms implemented on the data are detailed. Two distinct optically selected catalogues are constructed, one based on I-band overdensity, the other on overdensities of colour-selected galaxies. The superior accuracy of the colour-selection technique over that of the single passband method is demonstrated, via internal consistency checks and comparison with external spectroscopic redshift information. This is compared with an X-ray selected cluster catalogue. In terms of gross numbers, the survey yields 185 I-band selected, 290 colour selected and 15 X-ray selected systems, residing in $\sim 11\text{deg}^2$ of optical + X-ray imaging.

The relationship between optical richness/ luminosity and X-ray luminosity is examined, by measuring X-ray luminosities at the positions of our 290 colour-selected systems. Power law correlations between the optical richness/ luminosity versus X-ray luminosity are fitted, both exhibiting approximately 0.2 dex of intrinsic scatter. Interesting outliers in these correlations are discussed in greater detail. Spectroscopic follow up of a subsample of X-ray underluminous systems confirms their reality.