We consider the problem

$$\Delta u = \lambda(u - \phi)_+^{(}p - 1), x \in \Omega, u = 0 \quad \text{on the boundary of} \quad \Omega,$$

where $\Omega$ is a bounded domain in $R^N$ and $\phi$ is a positive harmonic function in $\Omega$.

This problem is related to steady vortex pairs in an ideal fluid.

Under the assumption that $\phi$ has $k$ strictly local minimum points $z_1, ..., z_k$ on the boundary of $\Omega$, we are able to prove the existence of a solution pair $(u_\lambda, A_\lambda)$ such that the "vortex core" $A_\lambda$ (i.e. where $u_\lambda > \phi$) has exactly $k$ components which shrink to the points $z_1, ..., z_k$ , as $\lambda - > +\infty$. Moreover these vertex cores are approximately balls.