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We characterize Hamiltonian circle actions on blowups of ruled symplectic manifolds of positive genus, up to (possibly non-equivariant) symplectomorphism. As a by-product, we provide an algorithm that determines the reduced form of a blowup form and which also provides a method for computing the Gromov width. Finally, we compute the equivariant cohomology of these spaces. Our work is a combination of “soft” equivariant and combinatorial techniques, using the momentum map and related data, with “hard” holomorphic techniques, including Gromov-Witten invariants. (Received January 13, 2016)