As Filed with the Securities and Exchange Commission on October 28, 2004

Registration No. 333-119832

UNITED STATES SECURITIES AND EXCHANGE COMMISSION WASHINGTON, D.C. 20549

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POST-EFFECTIVE AMENDMENT NO. 1 TO FORM S-8 REGISTRATION STATEMENT UNDER THE SECURITIES ACT OF 1933

BIMINI MORTGAGE MANAGEMENT INC.

(Exact name of registrant as specified in its charter)

Maryland

(State or Other Jurisdiction of Incorporation or Organization)

72-1571637 (I.R.S. Employer Identification No.)

3305 Flamingo Drive, Suite 100, Vero Beach, Florida 32963 (Address of Principal Executive Offices)

> 2003 Long Term Incentive Compensation Plan (Full Title of the Plan)

Jeffrey J. Zimmer Bimini Mortgage Management, Inc. 3305 Flamingo Drive, Suite 100 Vero Beach, Florida 32963 (Name and Address of Agent For Service)

(772) 231-1400 (Telephone Number, Including Area Code, of Agent For Service)

Copies to:

Robert E. King, Esq. Clifford Chance US LLP 31 West 52nd Street New York, New York 10019 (212) 878-8000

EXPLANATORY NOTE

This Amendment No. 1 is being filed for the sole purpose of filing a revised Exhibit 23.2. Due to an inadvertent filing error, the signature was omitted from the original exhibit. The contents of the Initial Registration Statement are hereby incorporated herein by reference.

SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, as amended, the registrant certifies that it has reasonable grounds to believe that it meets all of the requirements for filing on Form S-8 and has duly caused this registration statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of Vero Beach, in the State of Florida, on this 26th day of October, 2004.

	BIMINI MORTGAGE MANAGEMENT, INC.		
	By:	/s/ JEFFREY J. ZIMMER	
	Name: Title:	Jeffrey J. Zimmer Chairman and Chief Executive Officer	
Pursuant to the requirements of the Securities Act of 1933, as capacities indicated on the 26 th day of October, 2004.	amended, t	his Registration Statement has been signed by the following persons in the	

Name		Title
	/s/ JEFFREY J. ZIMMER	Chairman and Chief Executive Officer (Principal Executive Officer)
	Jeffrey J. Zimmer	
	/s/ ROBERT E. CAULEY	Chief Financial Officer and Director (Principal Financial Officer)
	Robert E. Cauley	
	*	Director
	Kevin L. Bespolka	
	*	Director
	Maureen A. Hendricks	
	*	Director
	W. Christopher Mortenson	
	*	Director
	Buford H. Ortale	
	/s/ AMBER K. LUEDKE	Treasurer (Principal Accounting Officer)
	Amber K. Luedke	
*By:	/s/ JEFFREY J. ZIMMER	
	Jeffrey J. Zimmer Attorney-in-fact for each of the persons indicated	

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EXHIBIT INDEX

Numbe	r	Description	
	4.1	Company's Amended and Restated Articles of Incorporation (incorporated by reference to Exhibit 3.1 of the Company's Registration Statement on Form S-11 (Registration No. 333-113715)).	
	4.2	Company's Bylaws (incorporated by reference to Exhibit 3.2 of the Company's Registration Statement on Form S-11 (Registration Statement No. 333-113715)).	
	4.3	Bimini Mortgage Management, Inc. 2003 Long Term Incentive Compensation Plan incorporated by reference to Exhibit 10.2 of the Company's Registration Statement on Form S-11 (Registration Statement No. 333-113715)).	
	5.1*	Opinion of Clifford Chance US LLP as to the legality of the securities being registered.	
	23.1*	Consent of Clifford Chance US LLP (included in Exhibit 5.1)	
	23.2**	Consent of Ernst & Young LLP	
	24.1*	Power of Attorney (included on the signature page)	
*	* Previously filed.		
**	** Filed herewith.		

EX-1

QuickLinks

EXPLANATORY NOTE SIGNATURES EXHIBIT INDEX

Consent of Independent Registered Public Accounting Firm

We consent to the incorporation in this Registration Statement (Form S-8 No. 333-) pertaining to the 2003 Long Term Incentive Compensation Plan of Bimini Mortgage Management, Inc. of our report dated March 11, 2004, with respect to the financial statements of Bimini Mortgage Management, Inc. included in its Registration Statement (Form S-11 No. 333-113715), as amended, and related Prospectus for the period from September 24, 2003 (inception) through December 31, 2003, filed with the Securities and Exchange Commission.

/s/ ERNST & YOUNG LLP

Miami, Florida October 15, 2004

QuickLinks

Consent of Independent Registered Public Accounting Firm