




<p>Project funded by the European Community under the MEDA WATER PROGRAMME initiative.</p>	 
--	---

<p>Deliverable N°: 1</p> <p><i>Preliminary Flood Analyses</i></p> <p>Report Version: 01 Report Preparation Date: February 2004 Contract Start Date: 01.06.2003 Duration: 48 Months</p> <p>Project Applicant: Istituto per la Cooperazione Universitaria - ICU - Rome (Italy)</p> <p>Partners:</p> <ol style="list-style-type: none"> 1. Associazione Volontari per il Servizio Internazionale - AVSI - Milan (Italy) 2. Centro de Estudios y Solidaridad con America Latina - CESAL - Madrid (Spain) 3. Litani River Authority - LRA (Lebanon) 4. National Center for Agricultural Research and Technology Transfer - NCARTT (Jordan)

<p>MEDA WATER PROGRAMME</p> <p><i>Euro-Mediterranean Regional Programme for Local Water Management</i></p> <p>IRWA</p> <p><i>Improvement of Irrigation Water Management in Lebanon and Jordan</i></p> <p>ME8/AIDCO/2001/0515/59776-P 007</p>	 <p>Improvement of Irrigation Water Management in Lebanon & Jordan</p>
--	---

DELIVERABLES SUMMARY SHEET

Project Number: ME8/AIDCO/2001/0515/59776-P 007
Project Acronym: IRWA

Title: Improvement of Irrigation Water Management in Lebanon and Jordan

Deliverable n. 1
Due Date: n.a. (in the project document, deliverables were not mentioned)
Delivery Date: 10th May 2005

Short Description:
Preliminary Flood Analysis of the Litani River, Bekaa Valley, Lebanon with preliminary identification of river characteristics and flooding critical zones.

Applicant: organization responsible is AVSI

BEKAA VALLEY

PRELIMINARY FLOOD ANALYSIS

Ing. Alberto Mazzucchelli

Ing. Marco Lanfranconi

Ing. Giuseppe Devecchi

Studio Associato MPM

Varese (ITALIA)

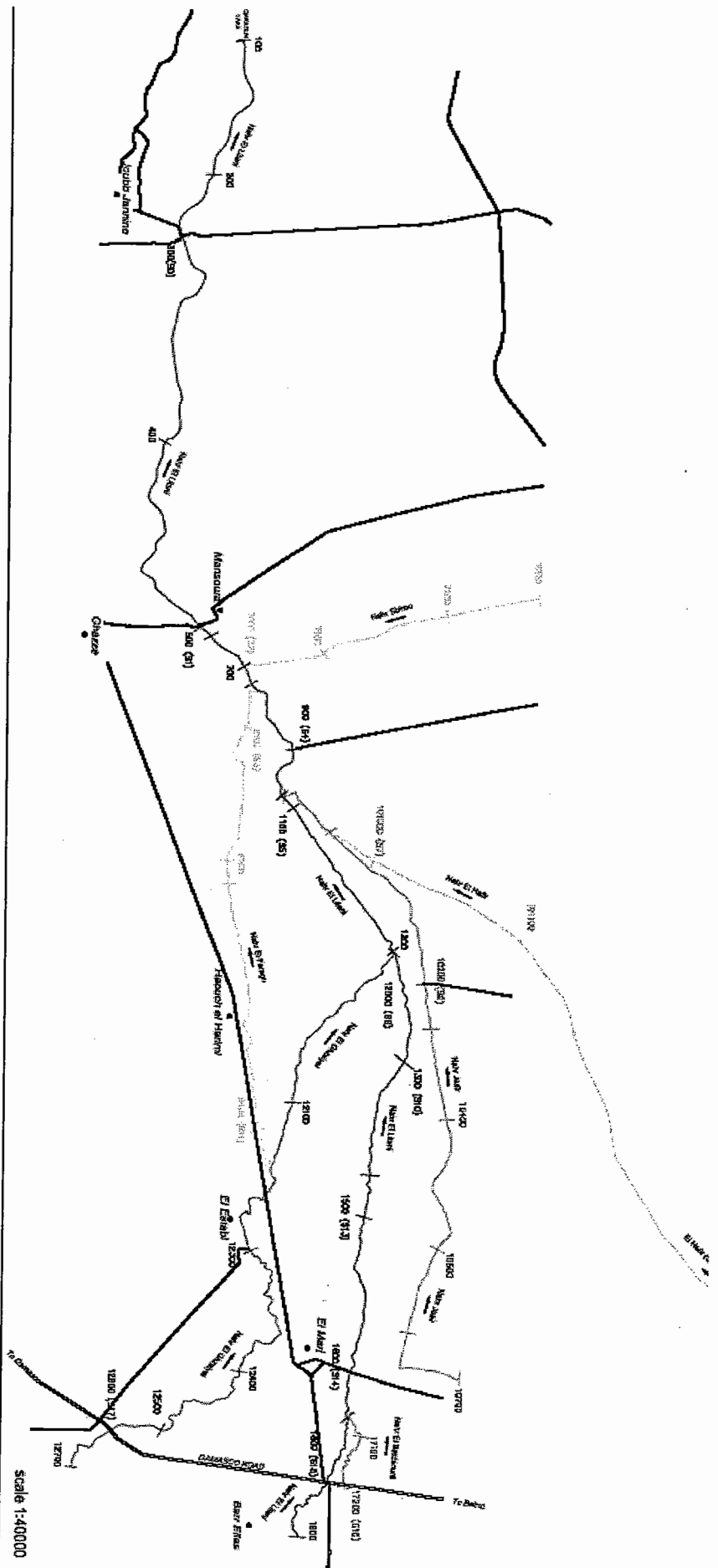
con Avsi e LRA team

Database & Parameters's Model

- FLUVIAL MORPHOLOGY : Aerophotogrammetries & Land Survey
- FLOW DATA: Litani River Authority's Daily Flow Data
- SOFTWARE: HEC – RAS River Analysis System v. 3.1.2
- HYDRAULIC MODEL'S CHARACTERISTICS: Steady Flow;
Geometry MONO-D

BEKAA VALLEY'S FLOOD ANALYSIS

Rivers's Scheme



Planimetry of the Rivers obtained from the analysis of the aerophotogrammetry database

BEKAA VALLEY'S FLOOD ANALYSIS

Flows Data

- HIGH FLOW (Step 3): Maximum flow registered in the Operational Limnigraphic Station*
- MEDIUM FLOW (Step 2): About 80% of the maximum flow registered
- LOW FLOW (Step 1): About 65% of the maximum flow registered

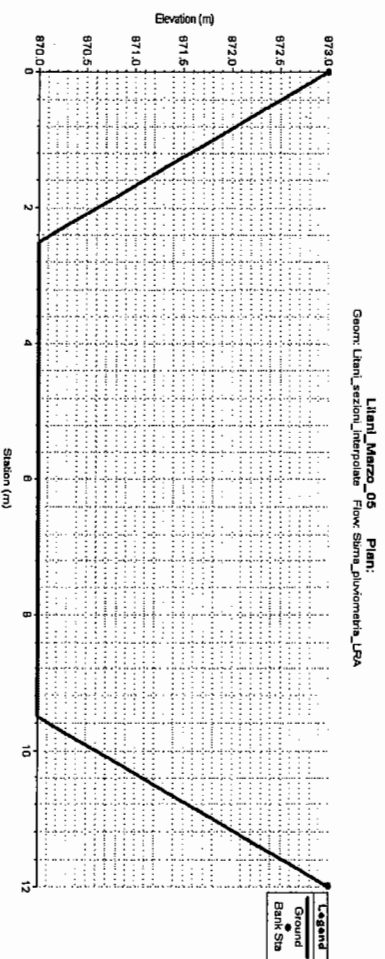
* Litani Authority River Station

BEKAA VALLEY'S FLOOD ANALYSIS

Software

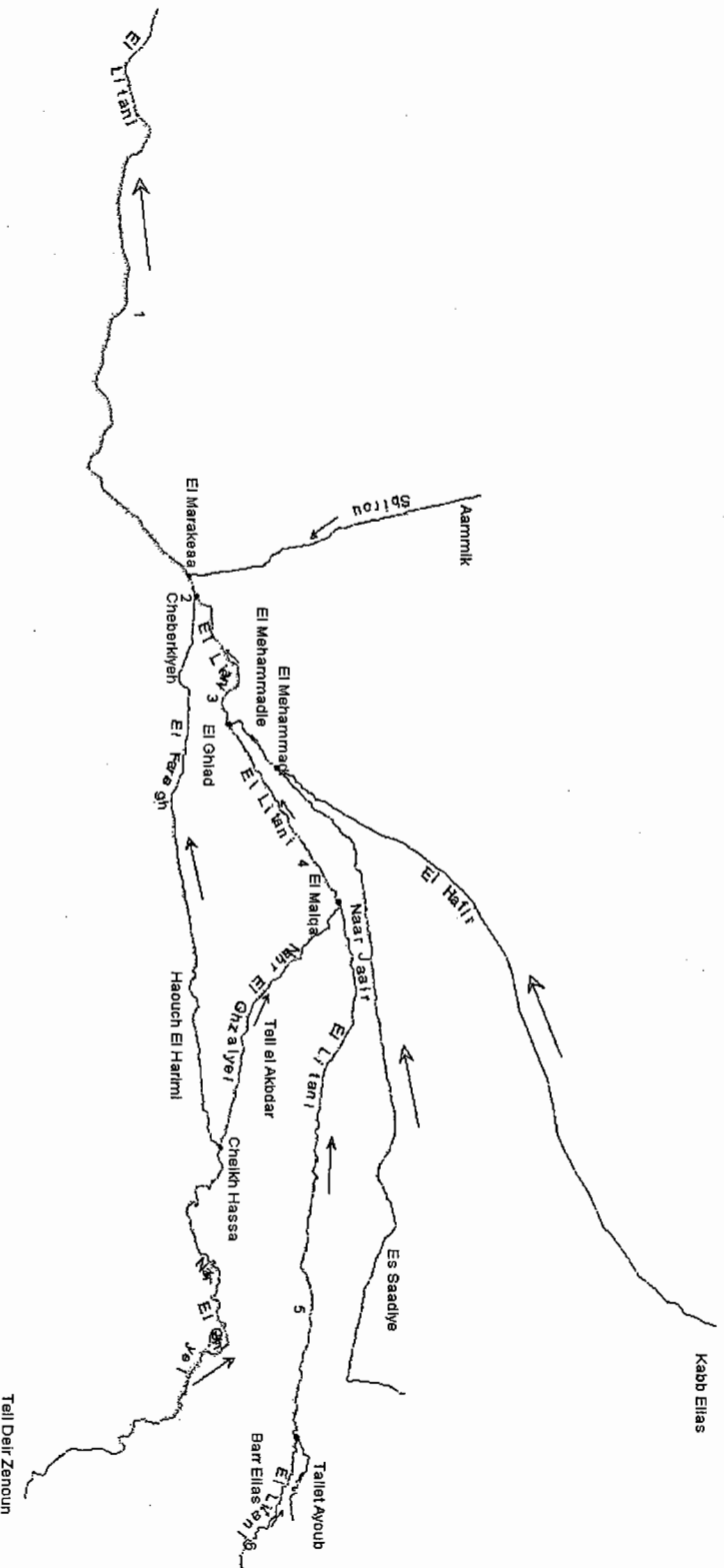


HEC-RAS
River Analysis System
Version 3.1.2 April 2004
Developed by the
U.S. Army Corps of Engineers
Hydrologic Engineering Center
808 Second Street, Davis, CA 95618
www.hec.usace.army.mil

Typical
Cross
Section

Planimetric
scheme of
the fluvial
system



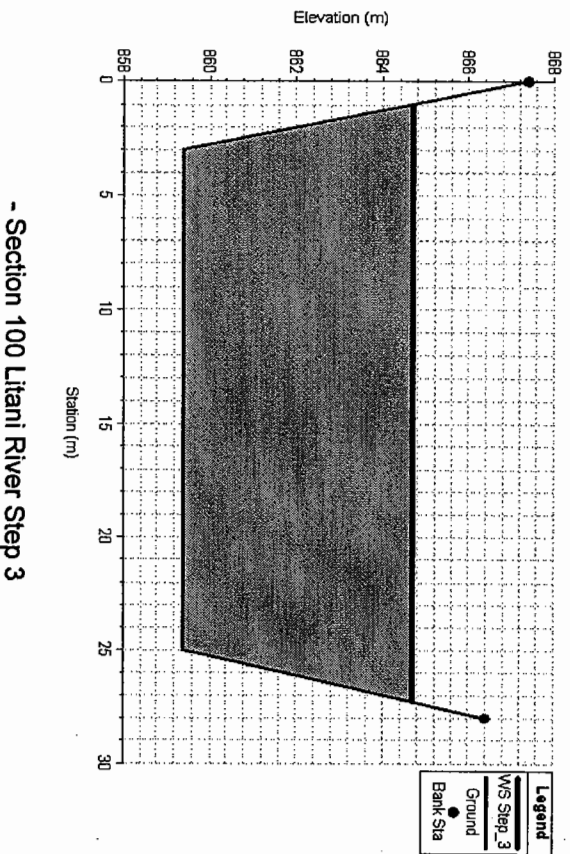
BEKAA VALLEY'S FLOOD ANALYSIS

Software's Output

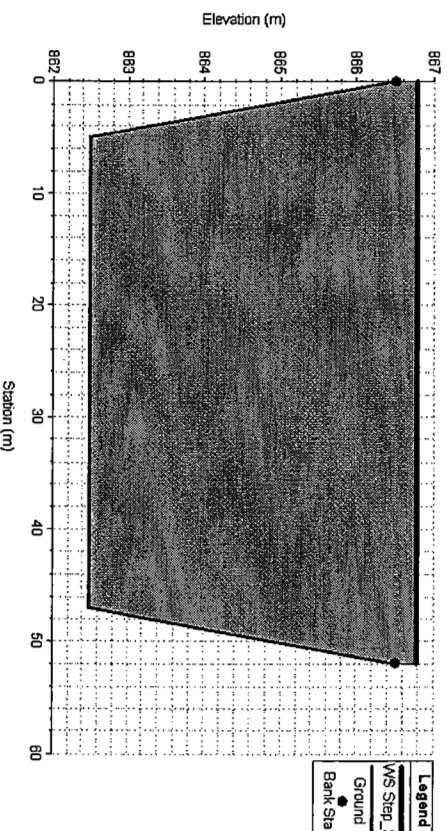
Cross Section Water Surface

- Section 100, 700, 1100 Litani River Step 3

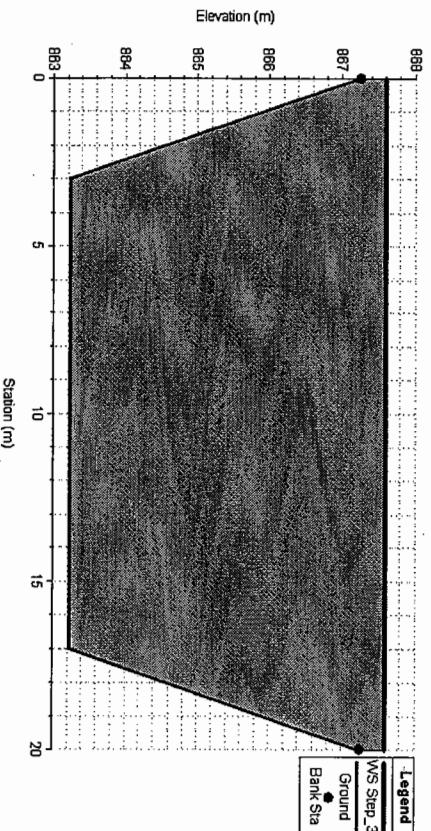
Litani_Marzo_05 Plan: Verifiche_step123
Geom: Litani_sezioni_Interpolate Flow: Sima_pilvometria_LRA



Litani_Marzo_05 Plan: Verifiche_step123
Geom: Litani_sezioni_Interpolate Flow: Sima_pilvometria_LRA



Litani_Marzo_05 Plan: Verifiche_step123
Geom: Litani_sezioni_Interpolate Flow: Sima_pilvometria_LRA



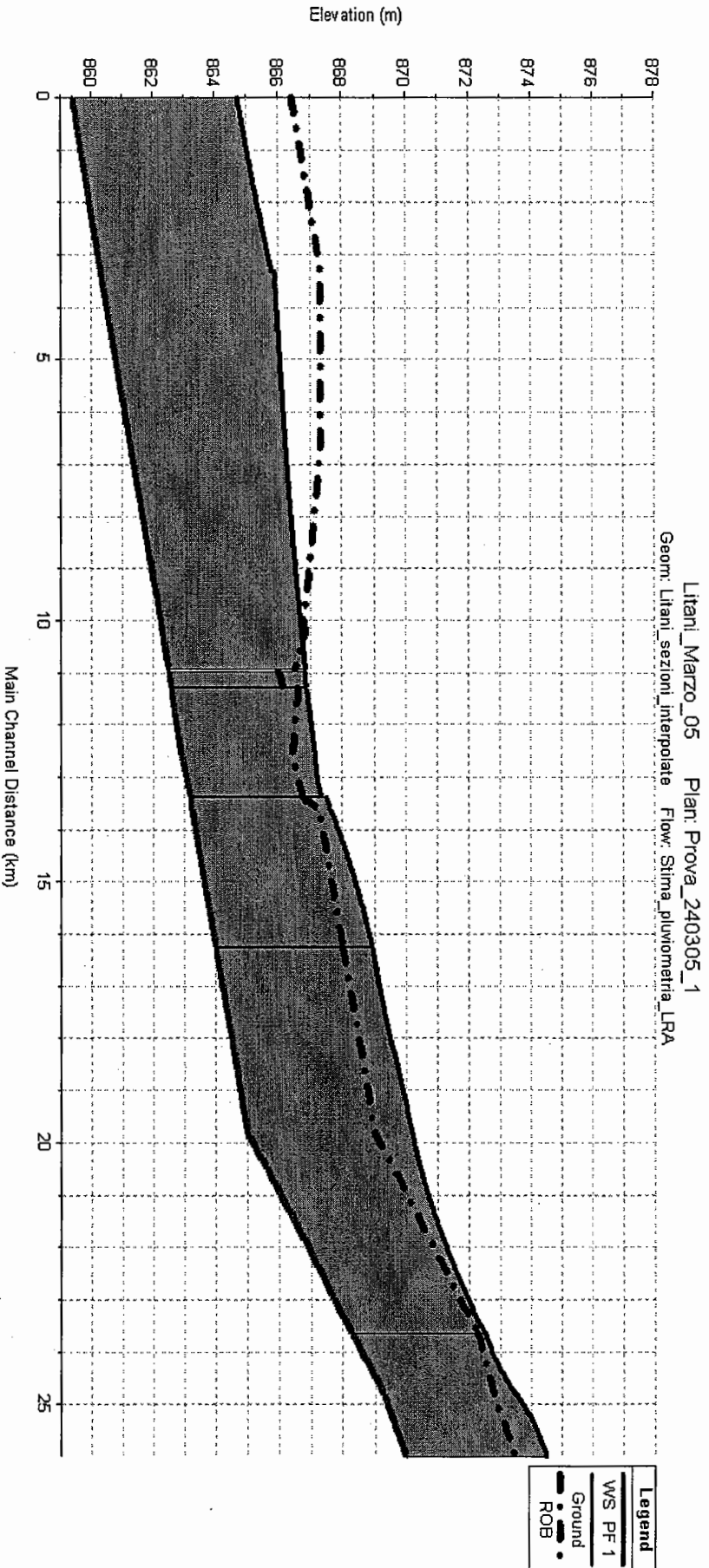
- Section 1100 Litani River Step 3

BEKAA VALLEY'S FLOOD ANALYSIS

Software's Output

Water Surface Profile

- Litani River Step 3



BEKAA VALLEY'S FLOOD ANALYSIS

Schematic of the flooded areas

Intensity of the Flood

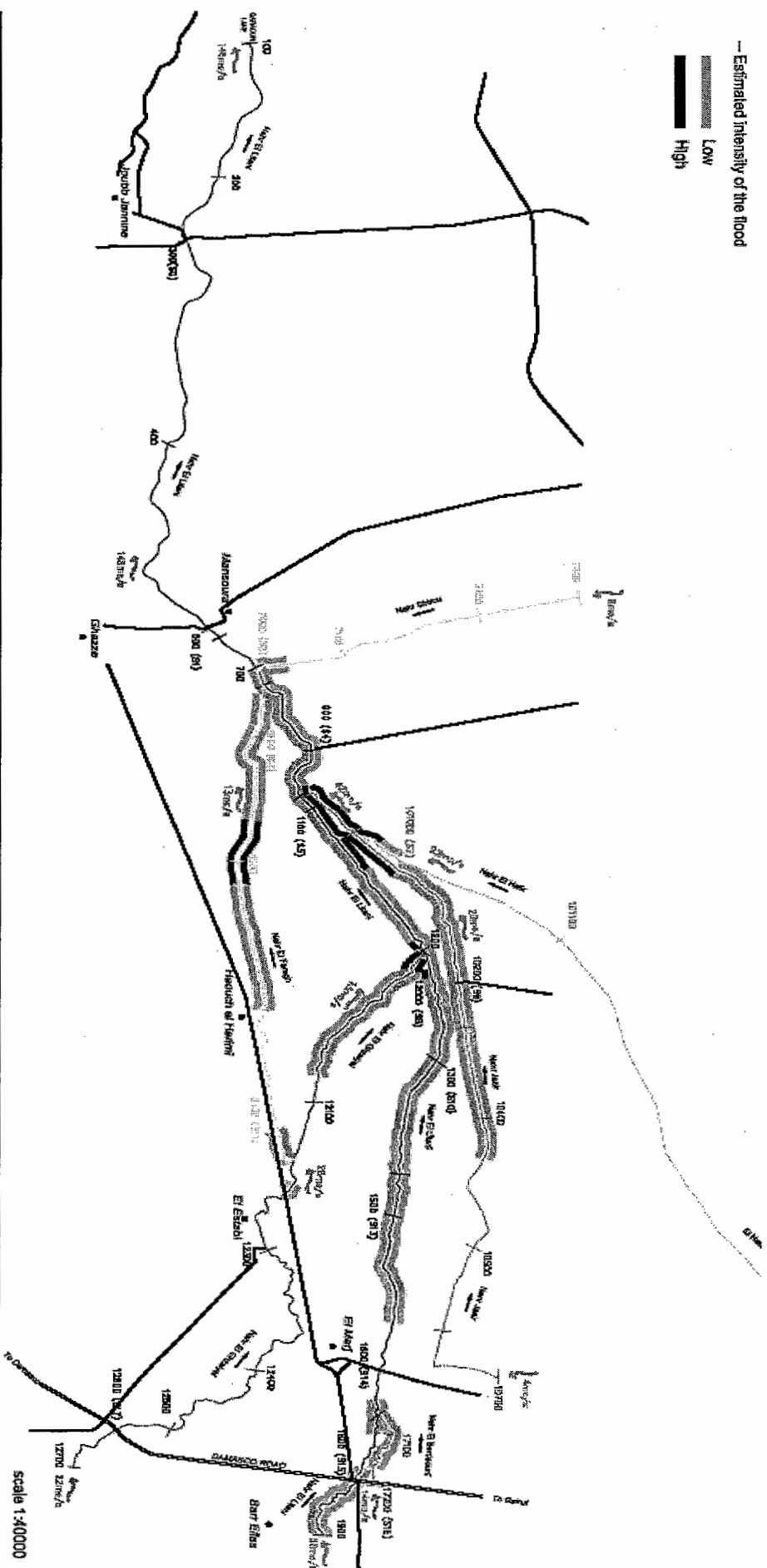
-Medium Flows

Model Step 2

- Estimated intensity of the flood

Low

High



Drainage and Flooding Critical Zones

